Technology in Service & Support of the University's Mission

2011-2012 Office of Technology Annual Report

TWU
TEXAS WOMAN'S UNIVERSITY
DENTON DALLAS HOUSTON

Contents

Cover
Patrice Armor, Manager of Technical Programming
Clay Till, Manager of Technical Programming
Alicia Fairweather, Sr. Integration Analyst

Office of Technology Dashboard

WHO WE ARE

78 Technology professionals

WHO WE SUPPORT[1]

15,141 Student enrollment (Fall)
391 Professors
403 Adjunct faculty
193 Teaching assistants
796 Staff

OUR ENVIRONMENT

3 Campuses
3,873 Desktop computers
625 Laptop computers
320 Projectors
401 Printers
195,035 Pounds of CO_2 eliminated[2]

78%
First Call Resolution rate for the old help desk

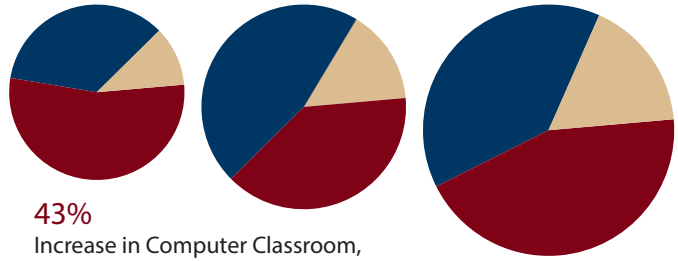
4x
Increase in potential Internet access due to core upgrades

99.5%
Internet Reachability including scheduled maintenance

2009-10
288,480 hours

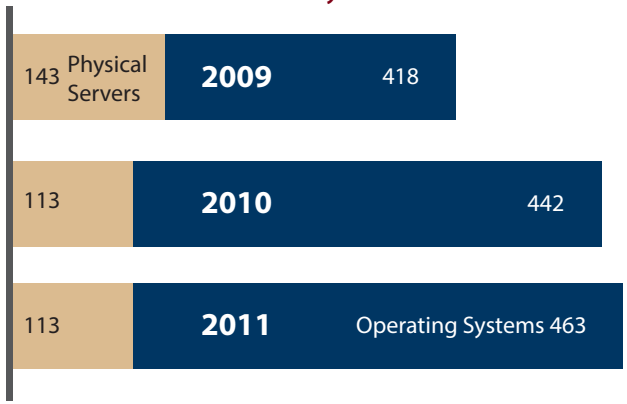
2010-11
336,643 hours

2011-12
413,428 hours



43%
Increase in Computer Classroom, Department, and Open Lab Usage Since 2009

Virtualization Density



	2010-2011	
Network Storage (TB)	283	326
Virtual Servers	442	463
Wireless Access Points	170	224
Source Code Projects	201	327
Kiosk Logins Change	-9%	-22%
		2011-2012

Note: Data estimated using best information available at time of publication
[1]TWU Fact Book (http://www.twu.edu/institutional-research/fact-book.asp) and TWU Campus Stats Report (http://www.twu.edu/compensation-classification/twu-campus-stats-report.asp)
[2]Based on Energy Star and EPA calculations

Reshaping the Future with Innovative Metrics & Data-Driven Decisions

Welcome to the first annual report from the new Office of Technology at Texas Woman's University. This year TWU's technology organization underwent a major overhaul—now configured and positioned to better serve TWU and its steadfast belief in the power of education.

As with a major new release of an operating system, we have some new features built on a new framework. Our framework is servant leadership. This new framework changes everything, and with change comes risk. We seamlessly transitioned from the old to the new without disruptions in service, and we are successfully doing more with the same resources.

Amplified collegiality stands out as one of the most valuable outcomes of the change. Through community decision making we enhanced our ability to build and foster collaborative relationships with the community we serve. The new process-oriented service desk model is another highlight of the change, and one I believe holds significant potential. Although the Office of Technology has come a long way, we are far from finished. This year we will create a solid technology governance structure, and I look forward to input from across the TWU community.

Throughout this report, you will find details of other new features, services, and metrics framed in a narrative of partnership and service. As the Office of Technology moves forward, we recognize a need for more innovative metrics that incorporate relevant and meaningful measures. At a time when higher education is being asked to quantify its contributions to its stakeholders and the greater community, the Office of Technology is seeking new and creative ways to measure our effectiveness. Often the decision to measure something is made because of its propensity to be measured. Instead we want to devise measures with democratization in mind—ensuring a measure of the things that will enable our community to make decisions that support the mission of the university.

Everyone at TWU is fortunate to be a part of providing learning communities to a growing population and to enhance what it is to be American—for students to be exposed to other thought processes and to gain a better understanding of their role in society as contributing citizens. Our country's founders were both intellectual and rebellious. They firmly believed in the power of thinking critically as the path to a free mind. I can think of no more worthy endeavor than serving an institution of higher education. I encourage you to read this report and explore the multiple ways the Office of Technology has contributed to the continued success of Texas Woman's University, its students, faculty, and staff.

Robert B. Placido

Robert B. Placido
Associate Provost for Technology & CIO

Mission & Values

Setting the Standard

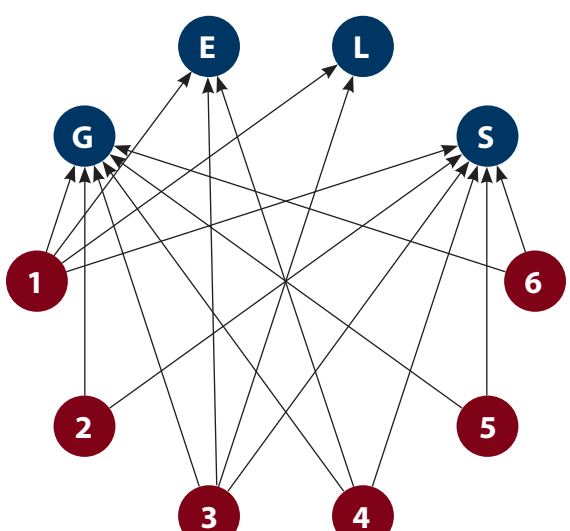
Through collaboration and servant leadership, the Office of Technology will design, manage and implement technology systems, processes, and services that support the mission of the university and state.

Our Values

- **Collaboration**
- **Innovation**
- **Accountability**
- **Value-Driven Service**

Technology Strategic Directions

1. Research and deliver classroom technologies to create engaged learning environments.
2. Provide reliable and secure infrastructure for information access and exchange.
3. Rapidly respond to the needs of the community by providing quality client services.
4. Consult, program and design services to continuously improve institutional operations.
5. Maintain a safe and secure technology environment operating in alignment within regulatory compliance.
6. Actively engage with state and national technology association to develop best practices and shape technology trends in higher education.



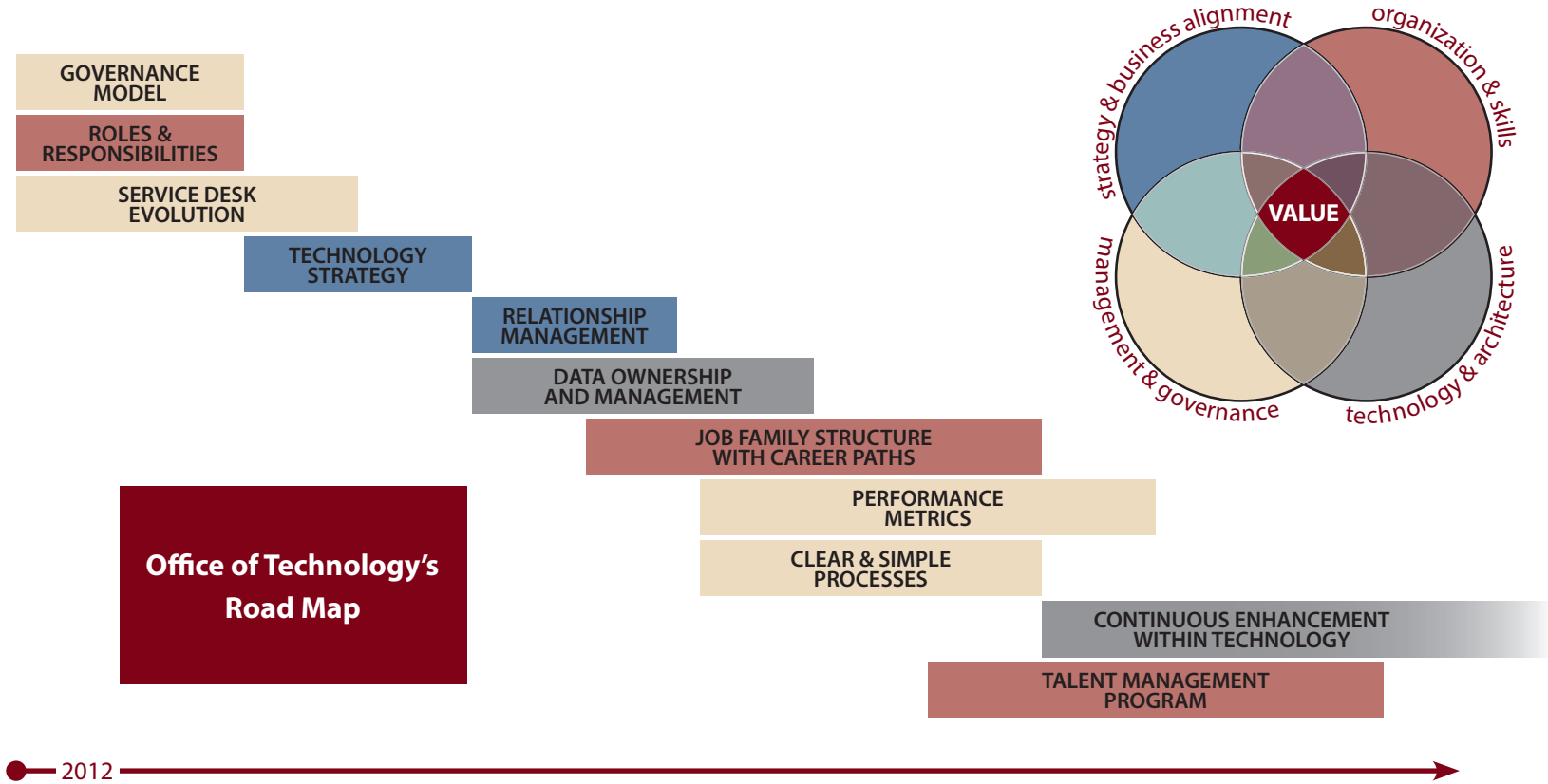
Academic Strategic Directions

G. Pursue planned **g**rowth based on academic priorities that address opportunities for students, and pressing needs of Texas, while maintaining excellence in the diverse fields that support such growth.

E. Support **e**xcellence in scholarship, teaching , and service to recruit and retain students and faculty, and to increase institutional recognition.

L. Foster a **l**earning environment focused on the success of students to live, work, and lead in a diverse and complex world.

S. Ensure **s**tewardship of university resources through responsible operations and investments in the mission of the university.



Defining a Framework for the Future

Our university has grown continuously and in significant proportions for more than a decade. Growth on this scale would not be possible without leveraging technology. The strain on our arm of the university is further compounded by the rapid shifts in cultural expectations and the even more rapid developments in technology itself.

As the role of technology continues to grow and expand into new facets of university function, so does its importance and hence the need for greater efficiency and further-reaching democratization. In an effort to better meet these needs, the Provost and Vice President for Academic Affairs, together with the Vice President for Finance and Administration, produced an analysis of what was then the Division of Technology and Information Services.

To help in producing the analysis, TWU contracted Gartner Consulting in January to offer industry perspective. Also working with the Office of Human Resources, the analysis examined the organizational structure, the roles and responsibilities of individuals

CLIENT SERVICES

- Technology Service Desk
- Desktop support
- Computer labs and classroom technology
- Video conferencing technology
- Dallas and Houston technology support

ENTERPRISE APPLICATIONS

- Colleague Student Information System
- Phoenix Oracle E Business
- Work flow solutions
- Third party departmental applications

TECHNOLOGY INFRASTRUCTURE

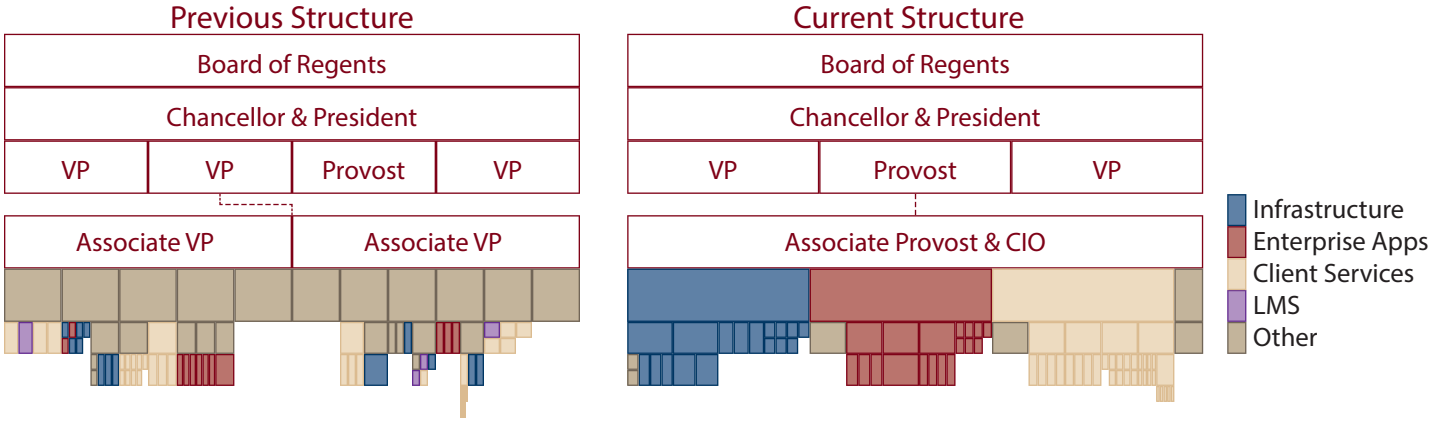
- TWU's wired and wireless network
- ACD and phones
- Information security
- Server infrastructure

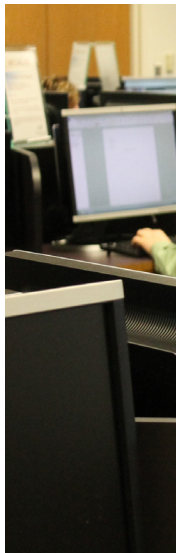
within the structure, and the processes and workflows within the division. In addition, open forums were held for faculty and staff to offer input.

In response to the analysis, the Division of Technology and Information Services was renamed to the Office of Technology and positioned under Academic Affairs. The Office of Technology is now led by the Associate Provost for Technology and Chief Information Officer (CIO), who reports directly to the Provost. Within the Office of Technology are three departments: Client Services, Enterprise Applications, and Technology Infrastructure. Our new framework will better support our university's dynamic and diverse needs as the Office of Technology partners with others in seeking continuous improvement.

Our mission and values are shaped by open governance to better seek input from students, faculty, and staff; and to share in the decision making about how technology can best support the mission of the university.

Streamlined Organization for Greater Economy and a Higher Level of Service.

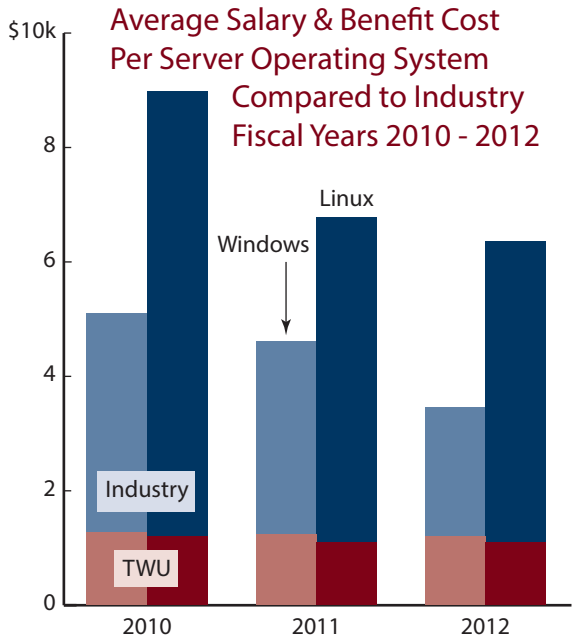


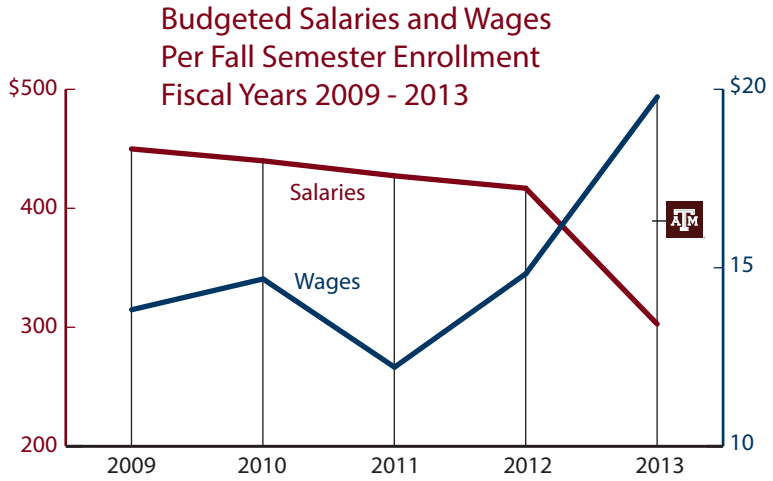


Pushing Down to Maximize Value

The reorganization resulted in a significant reduction in salaries, though we added numerous new positions. Upper management positions were consolidated while the new positions were added in the middle and lower tiers. In addition to adding more support staff, we increased the number of student assistant positions. Our analysis of state university support structures revealed that we employed less than one-third the number of students employed at other institutions. With an emphasis on research, our office will also begin providing graduate students new research opportunities. We have numerous practices within the organization that could be researched to improve our effectiveness.

In the last five years our budget has effectively flatlined, with a continuous growth rate of only half of one percent. During that same time student enrollment has had a rapid growth rate. Put another way, when considering the ratio of our total budget as compared to the number of students served, funding for the Office of Technology has declined significantly over the years. Along with the rest of TWU, we are perfecting the art of serving more with less.





We compare to Texas A&M as it is one of the few schools with a published IT annual report. Our salary per student ratio is well below Texas A&M, while their wage ratio is off our chart, more than double what we spend.

Technology Solutions

Higher Order Thinking

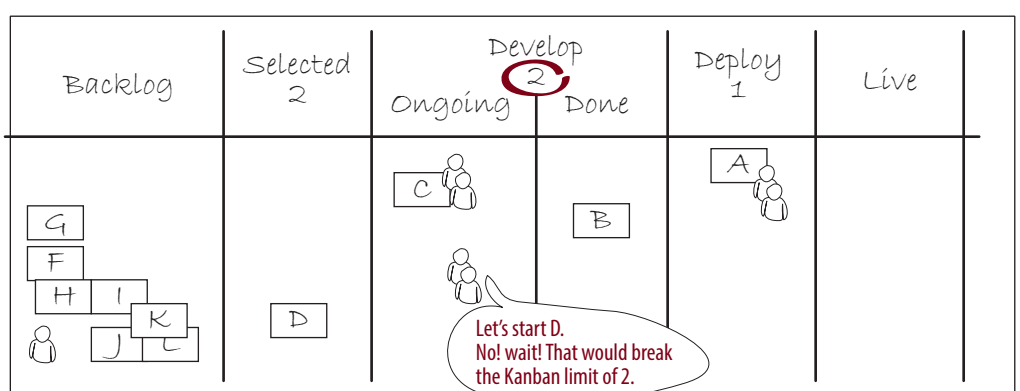

Network Operations Center

Interface Solutions

The best-structured database is efficient and supports a high degree of data integrity, but the complexity should be invisible for the people who use the system. Data always needs an interface that allows people to add, modify, and extract it in an efficient and intuitive manner. Our programmers design high-functioning custom solutions to interface with backend data.

One effect of our reorganization has been our ability to better support customized solutions. The number of source code projects that we are writing and maintaining is one measure of this capability. That number has jumped from 200 to over 300 during the past fiscal year for just one of the programming teams. Programmers on our team are moving to incorporate the agile method instead of the traditional waterfall model of development. Key advantages of the agile methodology are that it enables developers to rapidly create working solutions and to respond to change in requirements. This leads to higher satisfaction, which supports our service-oriented mission.

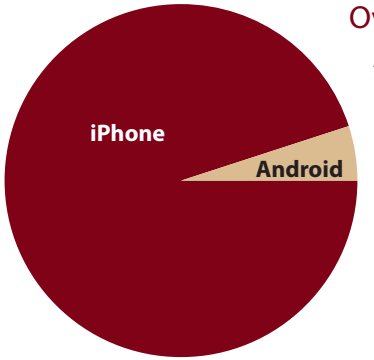
As a part of the migration to the agile methodology, our programmers are testing a new workflow strategy known as Kanban boards. Kanban can be translated to mean just-in-time, which is extended to mean what, when, and how much to produce—an evolution of Kanban cards used in the Japanese auto manufacturing. Its visual workflow promises to limit work in progress and to enable developers to better monitor, adapt, and improve workflow.



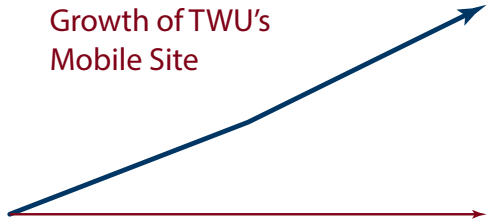
Web and mobile solutions are growing at an ever faster pace. After the reorganization, our web team turned the hierarchical website structure upside down. The project was designed to encourage collaboration across the technology departments. Members from each area contributed. We combined the results of a systematic review of top higher-ed technology websites with design principles and feedback from student and faculty focus groups to arrive at an all-new technology website. The new design puts service at the forefront and allows for dynamic refinements as more data on use is collected and analyzed.

The Enterprise Applications team developed several dozen new interface solutions. For example, Student Life has dramatically increased participation in its programs.

To handle the volume of students, we worked together to create solutions, such as automated online ticket sales and credit card processing. Another example is when the Office of Technology, Enrollment Services, and Student Development worked together to automate data processing and data entry during orientation sessions. When students sign up online for orientation, their personal data is pulled from the admissions data, saving redundancies, inconsistencies, and especially time for students and staff. Letters and e-mails with requirements are automatically generated in a timely manner. Even the check-in process is completed online, saving hours of manual data entry. The positive results we have seen due to the work on web-based interfaces make us eager to see what other implementations of this nature we can devise to save faculty, staff, and students time, allowing them to spend their energy performing tasks that cannot be automated.



Over 6,000
App Downloads



Growth of TWU's
Mobile Site

January
Launch

August Reaches
624,295 Hits

A Student-Centered Mobile App

Designing for mobile is not a choice; it's a must—not just to appear cutting-edge but also to offer students and faculty real functionality via their preferred interface. Marketing and Communications, Academic Affairs, and the Office of Technology worked together to develop TWU Mobile for Android and iPhone devices; the Windows Phone app is in production.

A substantial development project in completely uncharted territory can be risky. We explored an idea to outsource the project in order to mitigate development hurdles. After weighing the benefits and costs, we decided to move forward with in-house development. Web functions were prioritized using Google Analytics in combination with student feedback to maximize the ease of navigation.

Each of the three smartphone environments uses a different language, and each has different mechanisms for release to the public. The original TWU Mobile app for the iPhone was released in March 2010, with its fifth update, version 2.0.3, released in June 2012. More than 6,000 users have downloaded the iPhone app. The Android app debuted in Google Play on July 1, 2012. By the end of the fiscal year, the app had been downloaded 330 times, and its download rate is accelerating.

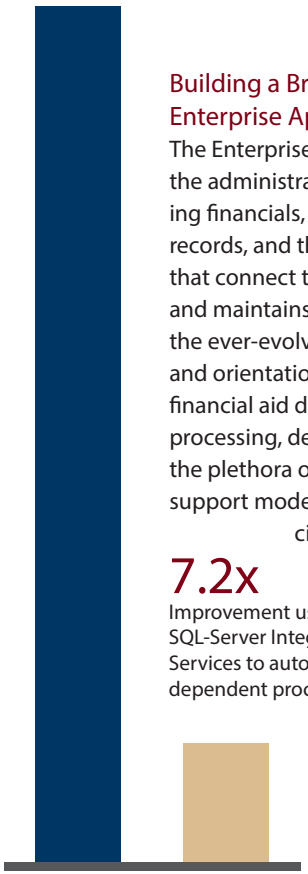
In March, Nielsen estimated that 50.4 percent of mobile phone users now use a smartphone. Following the trend of mobile usage, we will continue our tradition of innovation to meet the needs of the students, faculty, and staff at TWU.

Building a Bridge for Tomorrow's Enterprise Applications

The Enterprise Applications team supports the administrative aspects of TWU, including financials, human resources, student records, and the many user interfaces that connect to data. The team writes and maintains programs that support the ever-evolving processes in recruiting and orientation, student registration, financial aid distribution, tuition and fee processing, degree plan generation, and the plethora of other processes required to support modern administrative efficiencies in higher education.

7.2x
Improvement using SQL-Server Integration Services to automate dependent processes

To keep ahead, our Enterprise Applications team monitors changes in the industry that will best support our mission. With the combined years of experience of the team, we're positioned to evaluate the long-term enterprise needs, the direct and indirect costs, the internal staff capability and long-term support needs, and the data retention concerns. In its assessments, the team also looks at the specific modules used by the enterprise resource planning (ERP) entities at TWU.



Average Time to Complete Dependent Process Run for Enterprise Applications

To be ready for the future, we have decided to embark on a path to upgrade TWU's core technology to Oracle's R12, what the company describes as the bridge between data structures of yesterday and the functionality needed in the future. We began implementation of test processes in April and are on schedule for a go-live date of December 3. While the update to the core has consumed much of the Enterprise Applications team's energy, we have continued to work in parallel with our usual roles and responsibilities.

Colleague is a software package that houses the university's information in areas that include processing of student applications and registration, scheduling of classes, assisting in financial aid processing, processing of payment of tuition and fees, reporting grades and transcripts, and more. Previously those who needed to interact with Colleague used a Windows-based application. This summer we introduced a web-based user interface known as WebUI. With a more intuitive interface and flexible printing on a variety of printers, WebUI promises to offer new horizons for our university system. The migration to WebUI involved partners across the university. Student Records, Bursar, Registrar, Financial Aid, Housing, Scheduling, Undergraduate Studies, and Graduate School all contributed many hours to beta testing WebUI. Advisors were instrumental in initiating an extensive training schedule. Classes went from a few one-on-one sessions to multiple classes per week with more than 20 participants per session.

In another example, our Enterprise Applications team answered the call to modernize both official and unofficial transcripts. The Registrar also wanted to reduce processing time and errors in ordering transcripts, and we responded by helping to create an online ordering process for students. In this same vein, the Registrar partnered with us to move the process of confirming twelfth-day enrollments online.

If there is one way, there are a thousand ways the Office of Technology and the Division of Finance and Administration can support and streamline the workflow of staff around campus. For example, a small tweak

> The greatest help I receive from the Office of Technology is the face-to-face assistance in making our processes more efficient and effective. An example of this is the student service fee process. If left to our own devices, we would still be doing a lot with paper, pencils and calculators. The Enterprise Applications team observed our process, made numerous suggestions and helped us implement changes. The impact they have made on this process is immeasurable. Not only did it make the process more user-friendly, the improvements made it more accurate and dependable...The improvement was not a one-time experience. Every year the Office of Technology assists us with continuous improvements in the process and it gets better every time.
>
> —Heather Speed, Dean of Students

to the current PCard reconciliation process is saving staff in every department hours each month. As an aside, this change also provided the opportunity for one member of our team to observe a particular process to which she responded with a macro that reduced a 12-hour process down to 30 seconds. With the reorganization and its shift in roles, responsibilities, and governance, we look to be even more systematic in seeking out these kinds of low-hanging fruit to continuously improve efficiencies and support staff on all our campuses.

TWU's administration constantly strives to maximize the educational value. Course fees have been one point of confusion for students in paying for their education. This summer, under the leadership of Institutional Improvement, TWU instituted a new policy and process to level course fees, making it possible for students to anticipate their bill for tuition and fees. The Enterprise Applications team rapidly responded to adjust the process and created new programs to allocate funding.

Perhaps one of the greatest wins for the Enterprise Applications and Enrollment Services teams this year was an effort to streamline our most complex processes. Working together we analyzed a manually executed, complex, dependent process that had more than 20 steps, beginning with financial aid transmittal and ending with preregistration processing. The entire process was condensed and automated using SQL Server Integration Services (SSIS). What once took many people in many departments multiple days to complete can now be accomplished in a few hours. Additionally, these were the largest jobs running on the system, consuming large amounts of computing resources. The revised model runs more than seven times faster and runs during non-business hours. Automatic status reports alert all users at each step in the process. These timely reports allow users to work at optimal efficiency in their respective roles. It also allows our infrastructure team to monitor the hardware-intensive parts of the process so that we can manage resources in a way that optimizes the load on servers and network traffic. This story is a quintessential example of the manner in which we see technology supporting the university's everyday functions so that the human potential is freed to do what it does best.

I am reminded how important my job is every time I see students on their laptop or texting on their phones. What would we do without wireless networks?

— Tommy Walker, Technology Infrastructure

Empowering the People

Technology touts many promises, but the independence it allows is one promise with high visibility. Many bureaucratic processes start with a paper form that trickles through a system of controls, eventually receives some final approval, and ultimately results in data entry. The inefficiencies of the process are well-known, but often regarded as a necessary evil. In the Office of Technology, we look for ways to automate controls in such processes and eliminate the redundant, error-prone form-to-database data entry.

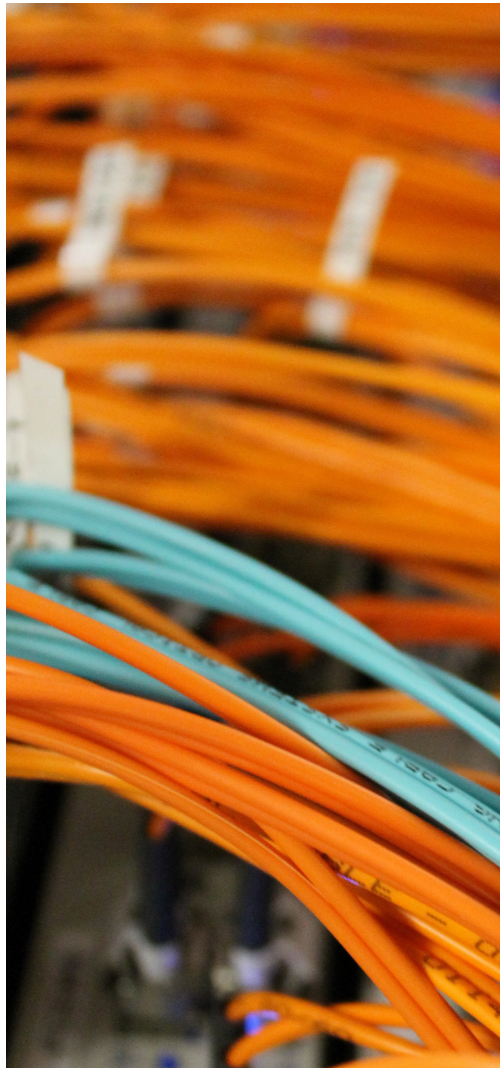
The Office of Technology and the division of Finance and Administration strive to provide faculty and staff with a variety of self-service options in the Phoenix system. With these self-services options, faculty and staff can do everything from changing their direct deposit account to changing their personal information—even the privacy setting on that personal information. They can easily change their W-4 tax information and retrieve W-2 forms, eliminating the need for paper distribution. Each employee at TWU can now accomplish all of this and more without forms or manual processing by staff at TWU—on-demand, accurate, efficient.

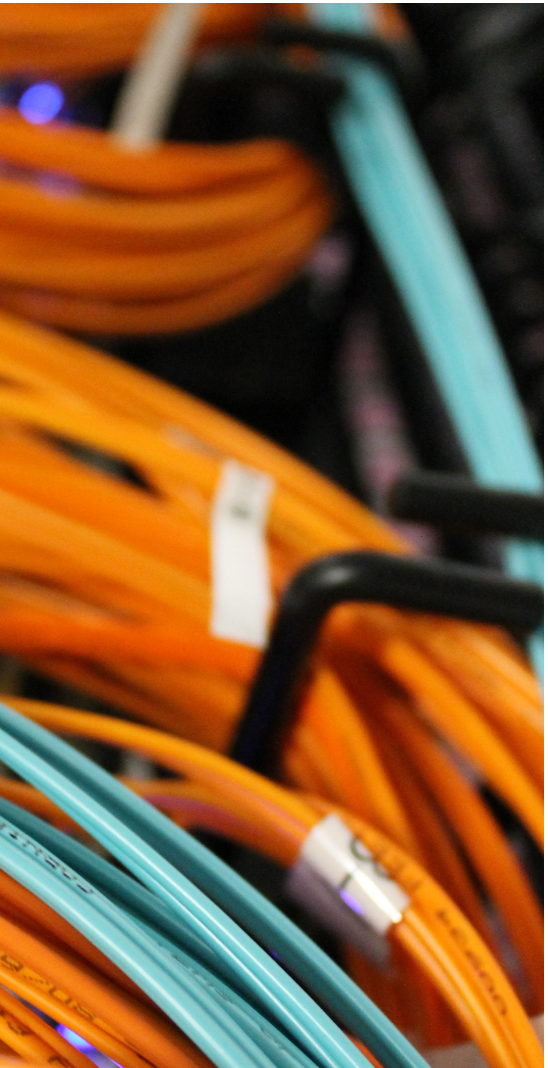
Enterprise Applications has also worked with department chairs and administrative staff to develop new reports that help in running hiring scenarios and budget management. In the past it's been difficult for a chair to compute the long-term financial effects of hiring new faculty and staff because of the complexity of factoring in benefits. One new SQL report in particular provides the ability to look at budget projections based on hiring decisions. Departments across campus are continuously devising creative ideas that we use in developing and refining SQL reports that give the right people access to the right information at the right time.

Powerful Tools Connecting People

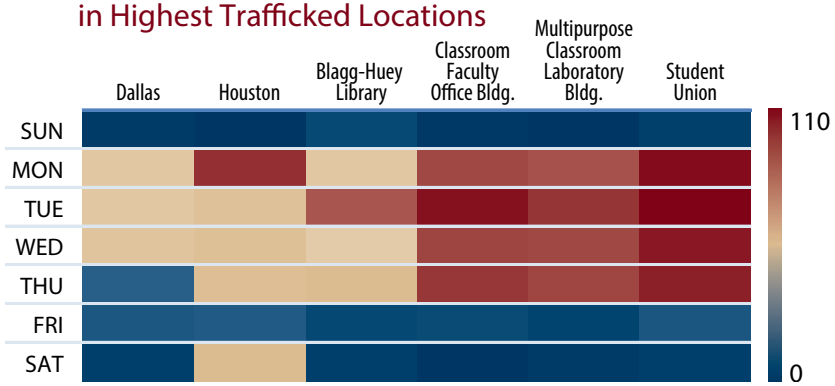
Communication is perhaps the most valuable service that technology brings to an organization. To be effective, communication must be relevant and timely. We acknowledge these ideas and aim to deliver the highest degree of quality in communication across and between each campus and with the global community.

In the past, TWU has suffered from many "dead zones." Dead zones are areas that don't have physical or wireless networking options. Beginning in March a university-wide project was started to address





Average Unique Wireless Clients in Highest Trafficked Locations



the issue. We are working with many partners to determine the areas by priority. The Director of Athletics was able to show that increased network capabilities at the soccer and softball fields could lead to increased opportunities for national NCAA broadcasting and special events. We delivered new fiber optic lines to the fields, enabling live broadcast capability. Subsequently, the Director of Athletics has been able to successfully attract broader exposure.

With the opening of the Institute for Health Sciences-Dallas Center, we worked with the Department of Public Safety (DPS) to deliver needed surveillance and safety services in the new parking garage. Components include ring-down phones, fire alarms, location services, and video monitors. We've also partnered with DPS to develop web interfaces allowing users to submit and change data for the institution-wide Pioneer Alert System.

The demand for wireless networking is growing exponentially. The Technology Infrastructure team started by offering Wi-Fi access points just in the common areas because faculty and staff had wired Internet connections via a computer in each office and most classrooms. The number of Wi-Fi access points jumped by 77 percent last year and increased by another 30 percent this year. With a project to install Wi-Fi in three dorms underway, we will soon be a fully Wi-Fi institution.

With the installation of our network control system server, we can now monitor and control all Wi-Fi access points remotely, saving physical trips by our network engineers to troubleshoot problems. The server also allows us to watch for shifting patterns. If emerging technologies create new hotspots, we'll be ready to serve the needs of the university.

Technology Support

A Process-Oriented Service Desk

Transforming the Help Desk into a Service Desk

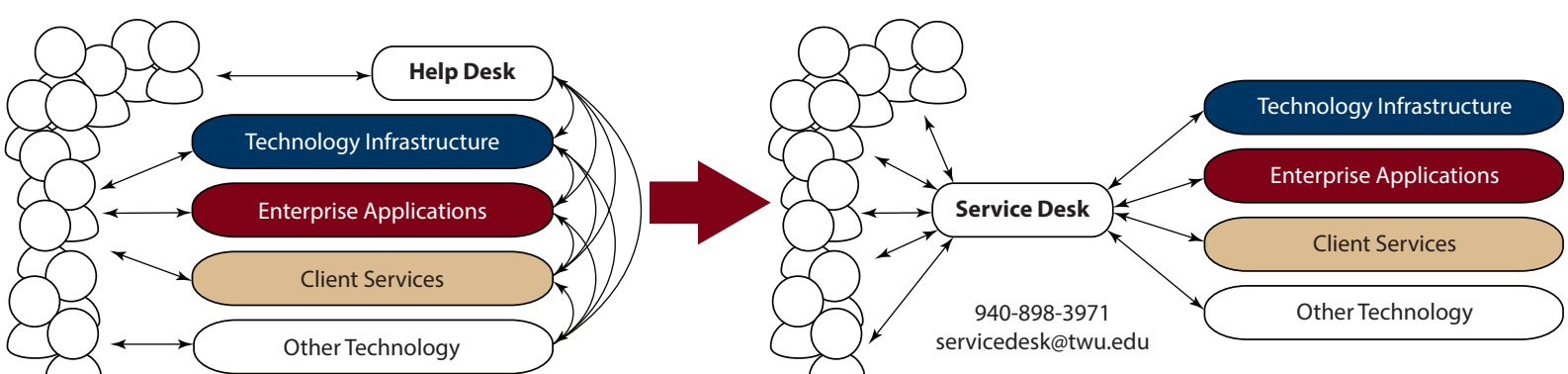
Service is a core value espoused by the Office of Technology. Transforming the help desk into a modern, process-oriented service desk stands as one of the more significant effects following the division's reorganization: the change is multifaceted, systematic, and ongoing.

In theory it would be nice to compartmentalize a trouble call, and the ability to do so was assumed in the previous help desk paradigm. In practice, many calls touch multiple areas, and the cumbersome project routing through the ticket management system reduced our efficiency. In the past, even tasks as simple as the tracking of service requests was unnecessarily complex.

To deal with these and other difficulties, the service desk looked toward the Information Technology Infrastructure Library (ITIL) as one of the most widely adopted approaches for IT service management.

ITIL defines a help desk as a means to get an end user back in service, often using minimal resources. In contrast, our service desk looks at our overall institutional strategy. As the new single source for all calls, our service desk will now have the opportunity to see the big picture. The service desk serves as the first point of contact for all technology-related needs. As we transition into this new paradigm, we will continue making gains in mining trouble call data for patterns and then partner with institutional entities to address root causes.

Looking at still other practical facets of adopting the service desk paradigm, our managers meet regularly with partners in various areas to facilitate bidirectional exchange of information, equipping our service desk technicians with the knowledge they need to efficiently handle trouble calls. The service desk has quadrupled the number of student technicians in a concerted effort to drive down the telephone abandoned call rate. A new prioritization strategy now gives calls from classrooms priority to minimize technology disruptions during teaching. All this and more has been accomplished in the first four months of the service desk paradigm, and we have many more improvements planned for the months and years ahead.



Delivering First-Class Support

Our Client Services team is responsible for the first-response technical support for classrooms, faculty, and staff at all three campuses. The reorganization has dramatically changed the way we structure Client Services. Prior to the reorganization, the teams that make up the current Client Services were distributed among four separate units.

Although many things are changing for the positive in the future, one thing that will stay the same is our PC replacement plan.

PC Replacement Cycle Analysis

We currently follow a four-year PC replacement cycle. Complex cost-benefit analysis is required to settle on a refresh rate. For example, moving to a five-year cycle saves on equipment cost, but maintenance costs would erase those savings. In addition, there are user productivity issues and work disruptions that are more difficult to quantify. We also considered the industry analysis and research produced by the Macquarie Strategic Advisory Services and the state's Department of Information Resources. Considering our unique factors and industry research, we have determined to continue with our current four-year life cycle. Once set, it allows us to better plan for biennial budgets and gives us certain leverage in negotiating bulk purchase agreements.

Description	1-Year	2-Year	3-Year	4-Year	5-Year
Cost of PC	$925.00	$474.06	$323.75	$248.59	$203.50
Initial Training	$25.00	$13.00	$9.00	$7.00	$6.00
PC Image Build	$50.00	$26.00	$18.00	$13.00	$11.00
PC Deployment	$110.00	$56.00	$39.00	$30.00	$24.00
Software/Patch Management	$201.00	$218.00	$234.00	$253.00	$272.00
Help Desk Support (first level)	$84.08	$94.24	$104.40	$115.49	$127.50
Technical Support (second level)	$67.48	$81.94	$95.59	$110.85	$129.33
Additional Warranty Cost	$0.00	$0.00	$0.00	$49.00	$99.00
Annual Cost	**$1,462.55**	**$963.24**	**$823.75**	**$826.94**	**$872.33**

At the end of the day we want to get faculty up and running as fast as possible!

— Allen Claytor, Manager of Technology

This year we also finished upgrading all Windows-based machines to Windows 7. Partnering with the TWU community, the rollout plan was completed with minimal disruption. We were able to distribute the new operating system to everyone because of our Microsoft Campus Agreement (MCA). Since 2001, we have maintained an MCA, saving the university nearly $300,000 annually compared to the costs associated with purchasing individual software licenses.

This is one of many examples of how we realize savings through economies of scale because we have centralized technology procurement.

Another example of a site license purchased by Client Services is Adobe Acrobat Pro. Acrobat Pro can instantly convert a form, based on a Microsoft Word file, into a fillable form (in PDF file format) complete with data collection capabilities and seamless electronic distribution. Considering the vast number of Word-based forms at TWU, such capability saves significant form-processing time. The software also has applications in classrooms for assignments or research.

Most significantly, PDF files are more universally accessible than Microsoft Word files, extending the reach and visibility of electronic text-oriented files created at TWU. We look forward to seeing the innovative ways in which department offices and faculty use this new capability.

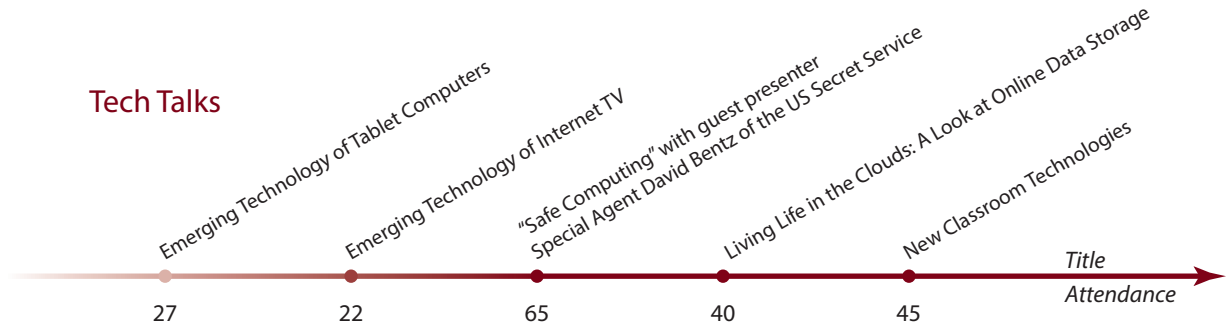
Working with academic administrators and faculty, we found a deficiency in the technology support of research. The first outcome of our focus on research was to purchase campus licenses for NVIVO and SAS. The NVIVO software package facilitates the analysis of qualitative and mixed-methods research. SAS is a powerful statistical analysis system with numerous applications including data mining, operations research, data warehousing, and even statistical analysis. These new products complement the products we license already (e.g., SPSS, MATLAB, and PsychData).

The staff in Client Services work vigilantly to keep abreast of developments in software and hardware on the client side, looking for trends that will support the mission of the university by bringing to our community necessary and innovative functionality with maximal usability for an appropriate cost.

The Office of Technology leverages the broad experience of our diverse team to ensure that our services meet and exceed the needs of TWU's students, faculty, and staff.

—Clint DeBusk, Service Desk

Tech Talks



Supporting a Tech-Savvy Community through Education

Technology is not just about doing higher quality work faster; we can use it to have more fun too. In fact, some postulate that as people delve more into the leisure side of technology, they find new motivation to use technology for business. These notions have inspired a series of personal and professional development presentations that we call Tech Talks. Among our team of experts, most like to geek-out on technology gadgets of one form or another. These talks provide a venue to connect their passions for technology to the hunger for knowledge about technology in our community. Topics have included Internet TV, tablet computers, cloud-based application and file storage, online security and identity theft, smartphones, and environmentally friendly computing, just to name a few. Attendance at the talks continues to grow.

Learning about technology and solving problems with technology are two services we provide; but, starting this year faculty, staff, and students can engage in on-demand tutorials from lynda.com about how to use technology. The Office of Technology and Distance Education collaborated on this exciting project. The professional, high-quality videos cover hundreds of topics and are presented in small chunks so that users can take in as little or as much as they need. It would take more than our entire annual budget to produce even half of what is available on lynda.com; and, with the rapid changes in technology, it would be impossible to keep up. In cases like this, outsourcing solutions cannot be beat. Students can use lynda.com, so we see great potential for augmenting course materials with direct links to these videos.

The Office of Technology is very proud of its partnership with students. Our Client Services team mentors a student-run program called Student Technology Assistants and Resources (STAR) program. Students can bring in their hardware, including tablets and mobile phones, for help with installing new components or software. The program also provides students with training on productivity software and other relevant online services, and will help remove viruses and malware. The STAR program is an excellent example of TWU's Quality Enhancement Plan (QEP): learning by doing.

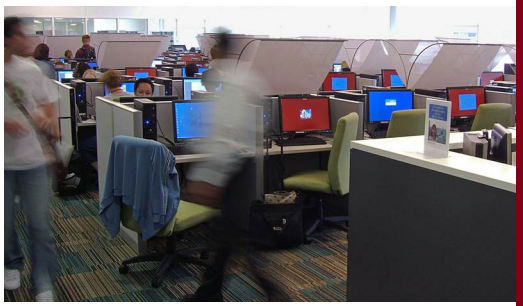
Metrics

Outperforming Goals

Defining the Standard of Service

In common with the majority (59 percent) of US institutions, TWU does not yet articulate the milieu of service level agreements (SLAs) found in corporate America. Philosophically, higher education does not espouse the customer-enterprise relationship in the same way corporations do. Still there are reasons to develop a higher ed analog to the SLA. For one, it's hard to measure up to a stated level of service without a statement. Secondly, an SLA standardizes processes triggered by certain events, so operationally dependent relationships know what to expect.

As a matter of research, the Office of Technology aims to be a leader in the realm of higher ed technology by defining the higher ed analog of the corporate SLA. We look to lay a philosophical framework, vet the framework, and publish about it.

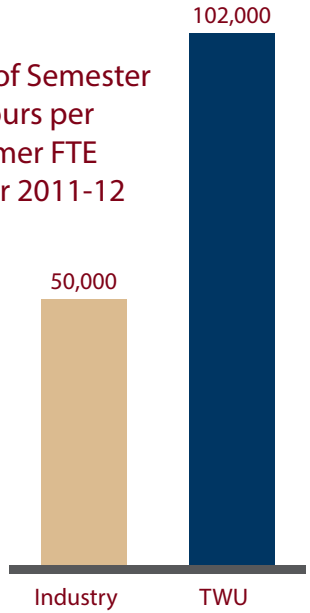


I cannot do my job without the support of the Office of Technology. I think the highest compliment I can pay is that I don't have to think about the support I receive from the Office of Technology. The support is there 24/7 giving us access to information and the ability to communicate and provide timely and effective services without ever knowing all that goes on behind the scenes to make this possible. When there is a temporary disruption, it's always restored quickly so we can go back to taking the Office of Technology for granted.

I truly appreciate all that the Office of Technology does to make my work life easier and more productive!

— Carolyn Hardin, Asst to the Dean of the Graduate School

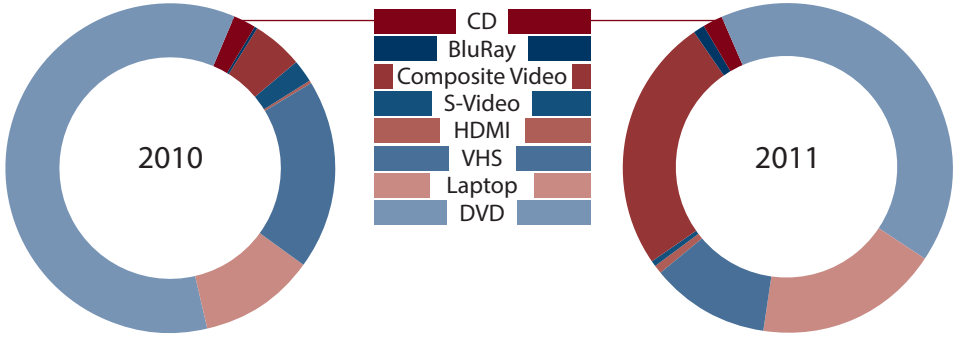
Number of Semester Credit Hours per Programmer FTE Fiscal Year 2011-12

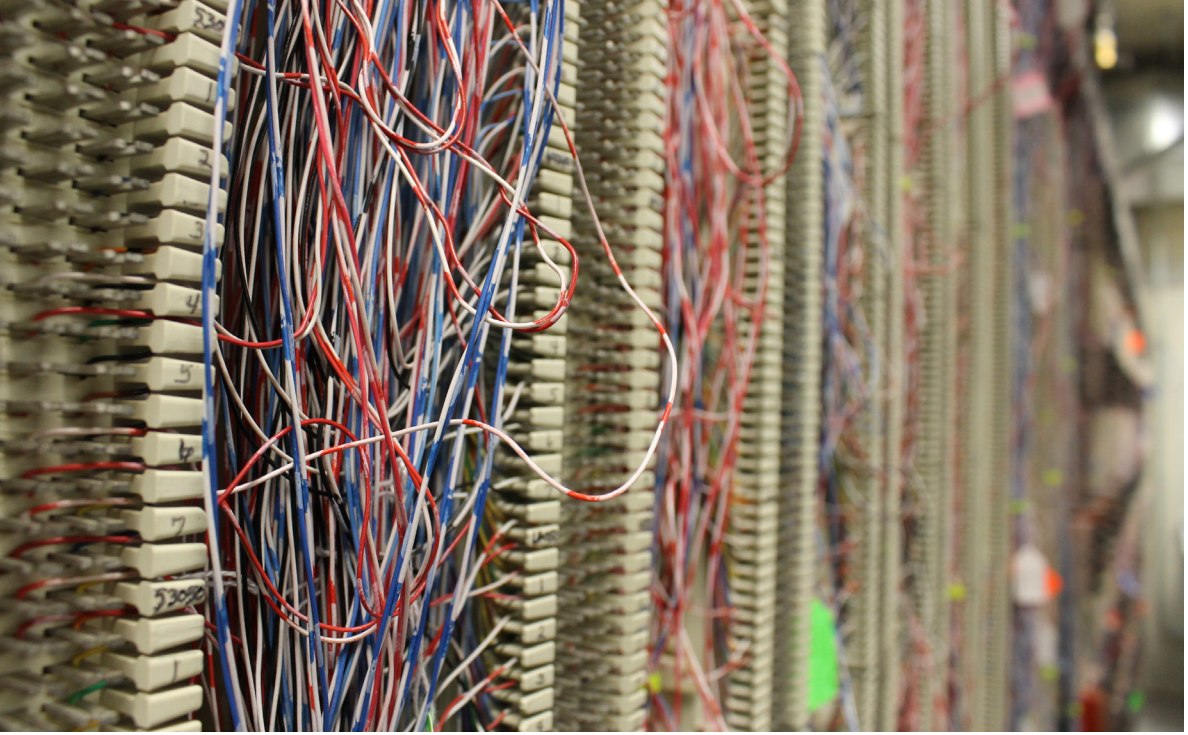


Higher Order of Pedagogy

As classrooms are remodeled, we see technology playing an increasing role. The possibilities for what technology to include and how to configure it are nearly endless. While we weigh many factors in making sound decisions, more innovative ideas and practical solutions often arise with greater diversity. We are excited to better partner with academics, facilities, and students in designing and developing the future landscape of technology in classrooms. We anticipate the approach will offer additional efficiencies and streamlined design as limited resources are employed for maximal use.

From usage data, we still see projectors and slide presentations as highest-use tools, but we also see that web use in the classroom is on the rise. With technology innovation for classrooms compounding nearly every day, we anticipate growing diversity in the ways technology is used in teaching. One example comes from kinesiology. Students in a measurement and evaluation course use a device of choice—most often their iPhones—to measure something about themselves. Sitting at individual workstations in a computer classroom, they perform statistical analysis on their data. The professor then systematically projects each student's screen in front of the class and uses their work to discuss statistical concepts. She feels the level of student engagement is significantly higher compared to slide-based lectures, and infers increased learning. Her story is just one from hundreds who value the ways they can partner with technology to help them deliver new forms of pedagogy.



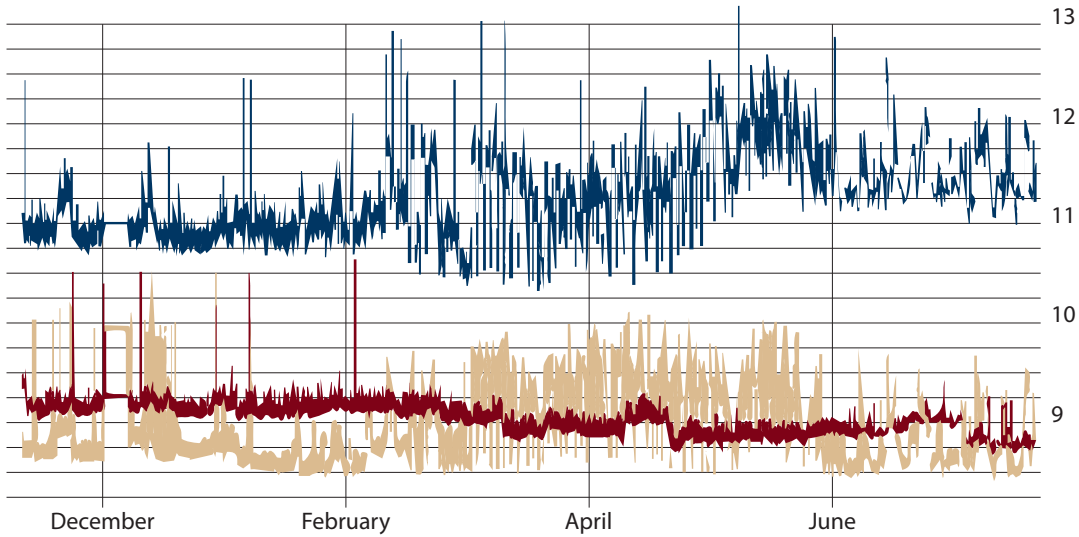


Growing Environmental Sustainability

Green initiatives are championed across our university system in accordance with the core value of stewardship at Texas Woman's University. We partner with the rest of the campus in not only doing our part but also leading in the area of technology. The US Environmental Protection Agency (EPA) named TWU one of the top five universities in the United States for its contribution to the national Energy Star Low Carbon IT Power Campaign.

Several years ago we committed to purchasing only Energy Star–qualified monitors, notebooks, and desktops. In combination with network power management, Energy Star estimates show that TWU saves over $200,000 annually just on the client side. Servers and associated cooling equipment require large amounts of electricity to run. Virtualization allows us to multiply the operating systems running a single server rather than multiply servers for each operating system. Eliminating the need for more servers saves significantly on resources. We now individually meter the electrical consumption of our server rooms, so we can look for new ways to manage load and save resources. In all our functions, we're mindful of the direct and indirect effects on electricity consumption.

With nearly ten million pages sent to print this year just in computer labs on the Denton campus, paper savings is another area where we work to be better stewards.



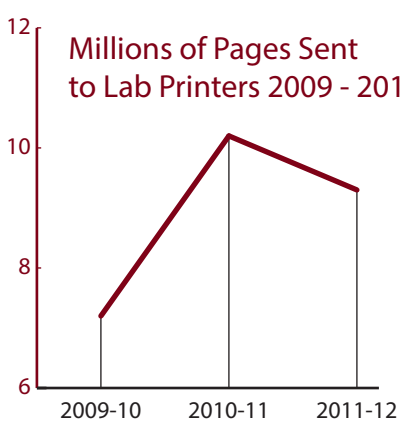
We Actively Monitor Our Power Consumption.

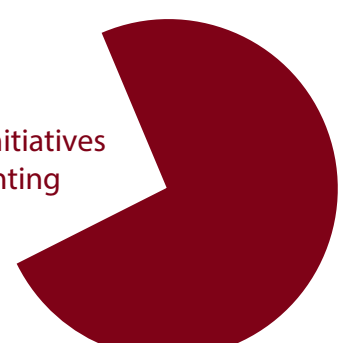
Main Server Room Power Output (kilowatts)

- Phase 3: 11.4
- Phase 2: 9.0
- Phase 1: 9.1

We continue to employ systems where students, faculty, or staff must actually come to retrieve their printout before the printing is carried out. This simple policy reduces the number of printed pages by 20 to 30 percent. We also set page limits, control the contrast, and force double-sided printing

As part of our new servant leadership philosophy, we live and breathe with sustainability in mind. Moving forward we have the momentum to develop even more partnerships across the university and externally in an ongoing quest to be even better stewards of our resources.





Next Steps

Learning to Foster Innovation

Refining & Defining Meaningful Metrics

Measurements allow us to compare. We compare ourselves to others and we compare ourselves in time. How are we doing relative to industry peers? How has an initiative impacted a measure? From measurements we develop policies and make decisions. Measurements can be complex or transparent, easy to make or challenging. We must consider the purpose, sources of error, industry standards, and cost as we choose metrics for the future.

If we look at computer usage, we currently measure both a count and duration of each log-in. In a classroom, a student may log in and do nothing more on that machine for the duration of a 90-minute class. In a lab, a student might intensely use a computer for 20 minutes. If log-in in duration (90 versus 20) is taken at face value, we would assume the lab isn't being used as much. This example illustrates the essential difficulty that arises when measures are made without first considering questions that need answered. For this reason, we will consider purpose carefully in devising new metrics.

In some cases, definitions are standardized and clear. Time service factor (TSF), first-call resolution (FCR), and mean time to recovery (MTTR) are a few industry-standard metrics

I just wanted to thank you and your staff for a wonderful job of helping me with my class. Technology support staff greeted me the very first day of class and helped me understand the two monitor system in the computer lab and also how to use the software to see the students' computers... Thanks again for all the support that you and your wonderful staff provide faculty.

— Barney Sanborn, Chair of Kinesiology

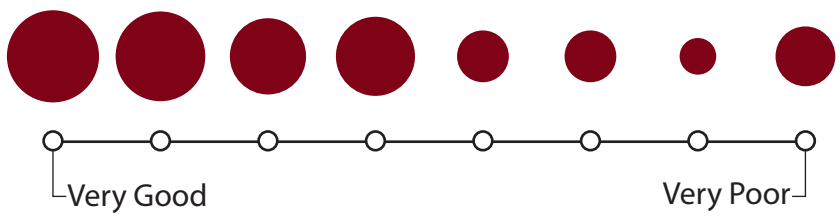
University Satisfaction Results for Technical Support

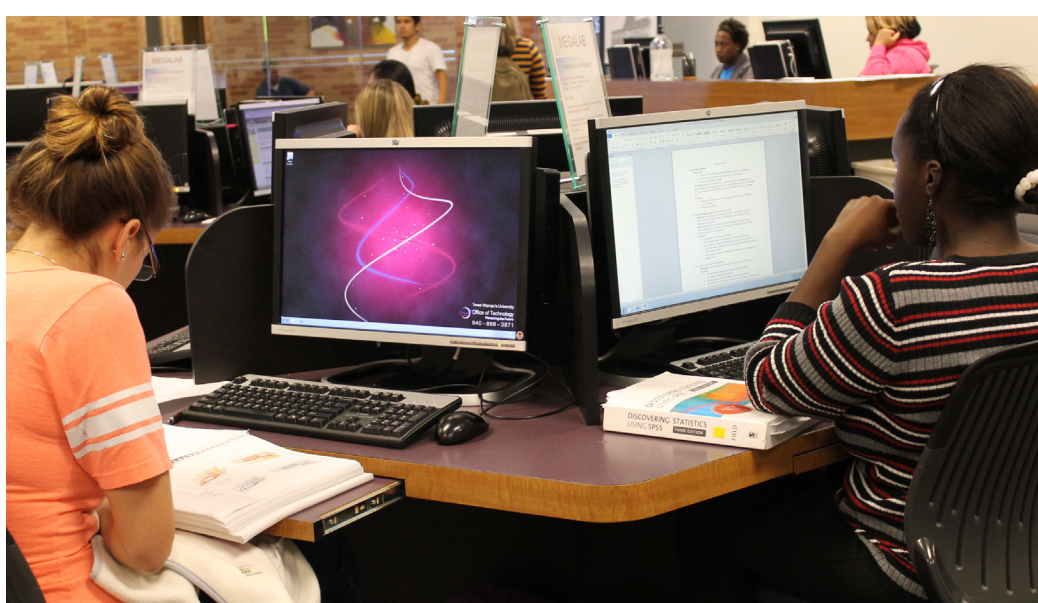
that especially apply to the service desk. Other measures could require pilot studies and other analyses to determine reliability and validity, but these measures may hold more significance in relation to the values that make TWU unique. In partnership with Institutional Improvement, and in consideration of the eventual governance model we devise, we will develop a library of meaningful metrics to supplement industry-standard ones. All our metrics must also produce timely data to be useful in decision making. We have the talent to meet the challenges, and we look forward to the benefits that quality data will have for us and our partners.

Leveraging Communications to Maximizing Productivity

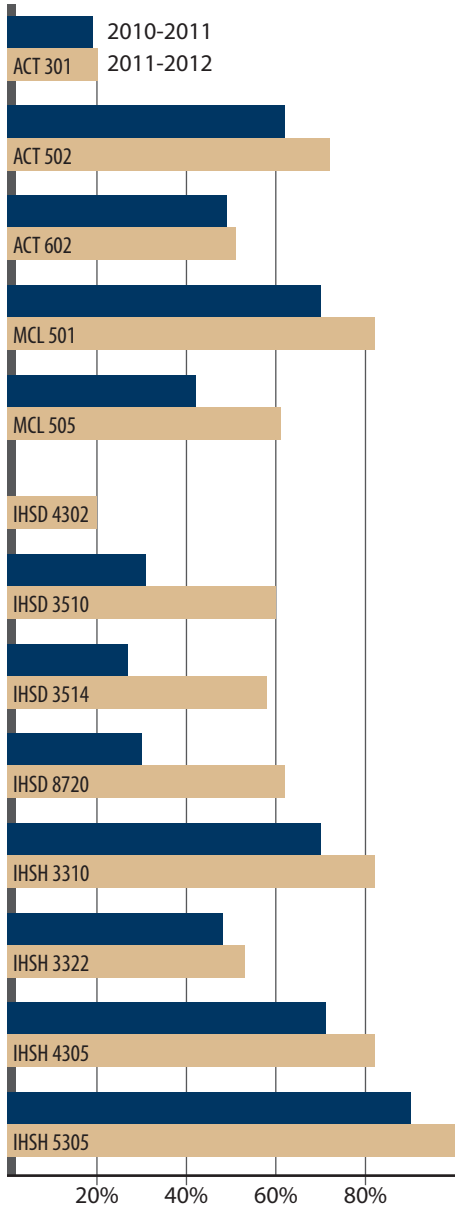
As our telecommunication systems age, the cost to maintain them increases. In the summer of 2012 we began the process of reviewing replacement options. Our focus is in providing a unified communications (UC) strategy that integrates e-mail, voicemail, video conferencing, and instant messaging and promises to improve logistical processes and operational effectiveness. Moving to a UC platform will drive down costs, increase productivity, and foster a more innovative workplace.

University Satisfaction Results for the Student System





Percent of Videoconference Use



Subcultures vary regarding one's preferred form of communication—face-to-face, telephone, text messages (SMS), e-mail, and others. E-mail is still a popular, albeit complex, form of communication at TWU. With the growing rate of blanket e-mails that do not pertain to groups of individuals, there is a decrease in the effectiveness of using e-mail for conveying important messages. We recognize the need for policies that allow some to opt out of some types of e-mail and not others. Partnering with faculty, staff, and students, we aim to develop policies and implement them during the coming year.

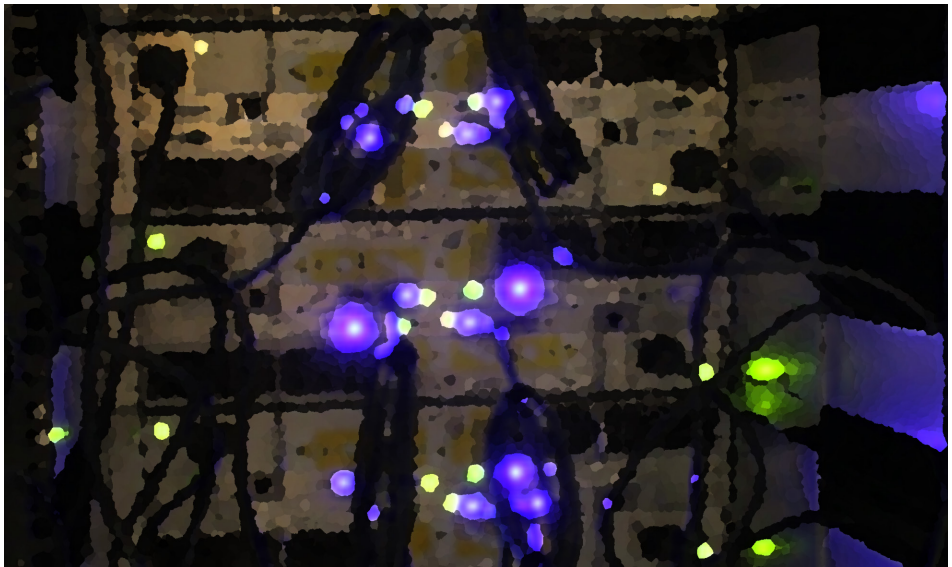
Also on the topic of e-mail is the possibility of outsourcing it. Over half of US institutions are already outsourcing student e-mail. Cost savings and avoidance are leading factors, but enhancements and cross-institutional collaboration are cited as other reasons. The decision to outsource will again involve students, faculty, and staff in accordance with our new governance model.

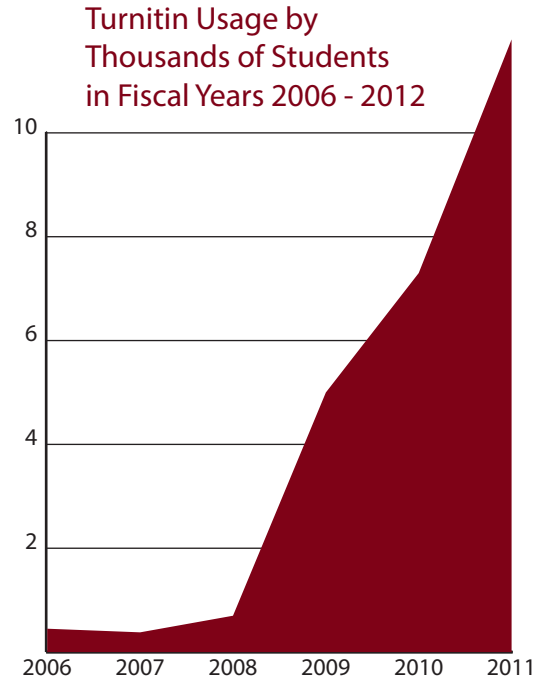
Bring your own device (BYOD) is yet another huge cultural shift on our radar. Some CIOs believe the era of company-supplied physical desktops will give way to BYOD in less than five years. BYOD offers faculty, staff, and students more choice when it comes to device and software. Many already use software they purchased to accomplish enterprise or school-related work. With increase mobility and more care paid to personal equipment, some research shows boosts in morale and productivity in a BYOD culture. While it can save the institution money, BYOD also brings greater complexity for network security. We have formed a committee to look at a BYOD solution for TWU as a means of keeping our workplace and educational space motivating and innovative.

Partners in Design & Redesign

In partnership with Facilities Management and Construction, the Office of Technology is part of nearly every new construction and remodel at TWU. With our forthcoming governance model, we anticipate more creative design ideas with better transparency in how our resources are allocated for remodel projects. Charging stations and wireless collaborative areas are examples of ways we look to step outside the box when remodeling space on campus. Digital signage in high traffic areas is another change to look for in the near future. Such signage will allow our partners to better communicate with certain populations at TWU.

We are also looking to improve the experience of video conferencing in the classrooms. We recognize sound quality and other issues sometimes plague the current system. We are currently vetting newer technology in conference rooms before scaling up across our campuses. In conjunction with the development of metrics to measure quality, we plan to set goals and make sure our video conference technology meets our high expectation of quality.





In partnership with the Department of Public Safety and Facilities Management and Construction, we are working to update and add emergency communication equipment throughout our campuses. Our goals for a solution include high visibility, ADA compliance, and cost effectiveness. We anticipate finishing this project by the end of the next fiscal year. In all these areas of innovation, we do not drive the project but rather partner with others and help ensure that the needs of our students, faculty, and staff are met at a quality exceeding expectation.

Security

Gaining a Position of Strength

Making Security Seamless

Developing the right mix of security policies is a complex balancing act. At one extreme, the locked-down, ultra-secure system limits access to the point it becomes unusable. At the other extreme, the network suffers outages caused by unsavory traffic while malicious entities are allowed to easily steal sensitive data. To complicate matters, the choice of mix is a moving target. Our security team is vigilant in setting and maintaining security policies. We are highly communicative with our campus partners, gauging the ease with which they access needed information.

According to EDUCAUSE, "Institutions with full-time information security leaders have implemented significantly more information security practices than other institutions." Yet only 29 percent of US institutions dedicate at least one full-time equivalent (FTE) staff to the role. The Office of Technology team is serious about protecting our technology infrastructure and the data it stores.

This year our Technology Infrastructure team installed a redundant firewall in Dallas at the point where our local network connects to the Internet. If one firewall goes down, the backup automatically comes online. We also have partitioned the network into multiple subnetworks, or DMZs, a separate DMZ for the enterprise, wireless devices, dorms, etc. Since student and wireless devices carry higher risk, if that DMZ is attacked, the enterprise DMZ can continue to function unscathed. The enterprise DMZ can also be locked down more tightly than is necessary for public networks.

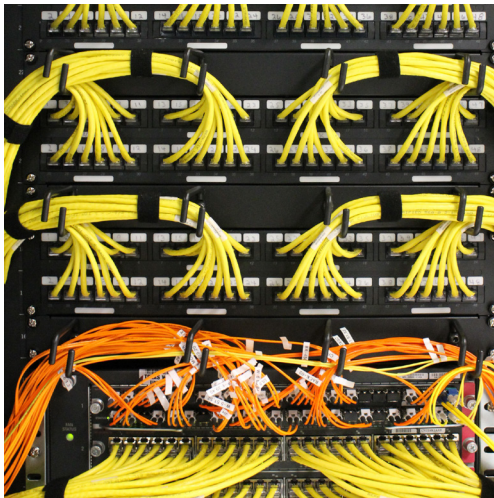
Raising Defenses

As the saying goes, an ounce of prevention is worth a pound of cure, so we continue to emphasize education in our mix of security policies. This year we have improved password strength prompts and policies. We continue to provide annual training during security month in October, partner with Human Resources staff in training new employees about security, and partner with Housing staff to bring better awareness to students living on campus. As part of our prevention campaign, we also circulate monthly newsletters, develop posters and fliers, and accept classroom invitations to talk about security.

In support of a risk assessment initiative led by the leadership of Finance and Administration called RedFlag, the Office of Technology systematically evaluated departments' processes and procedures to document potential vulnerabilities in handling sensitive data. The assessment phase was completed this year, and the analysis is in process. We continue to hold to our belief in preventive measures and risk assessments as keys to a strong defense.

Fiber Ring Adds Degrees to Network Reliability

This year we finished laying new fiber cable, creating a fiber ring on the Denton campus. Our goal is to provide more network redundancy across campuses. Historically, a break in a single connection between buildings could render the network systems effectively inoperable. With the ring, a single break



We have a proven track record of meeting strategic and regulatory imperatives by leveraging technical expertise and business acumen through partnerships and collaboration to ensure academic, business, compliance and customer service requirements are met within the technical environment.

—Nathan Routen, Information Security and Disaster Recovery

still allows network traffic to flow with little to no disruption in service. We are pleased to report significant progress in the ring's construction. It is another example of our commitment to ensure that the important work of our institution is never impeded by technology but only enhanced by it.

In another effort to enhance the robustness of our network, we are investigating new open-source implementations of DNS and DHCP, which are network systems for handling network traffic. Previous open-source options were riddled with security holes, but more recent options have a proven comparable security record to proprietary options and are even seen as offering greater security in some respects. For these reasons, we are looking at the potential of open-source protocols offering more for less funding.

In the future, we will upgrade our Dallas center's network connection to the data center and Internet portal, which is also located in Dallas. Denton and Houston are currently connected with 1000-MB connections while the Dallas center's connection is still at 100 MB. In 2011, we switched our Internet portal provider, which connected directly to the Denton campus. This was an attempt to improve our Internet reachability stats. Our new provider's Internet landing and databank is located in Dallas, so the three campuses connect to each other and to the Internet via that portal. Only the Dallas center's connection is left to upgrade.

Monthly Averages for Network Traffic

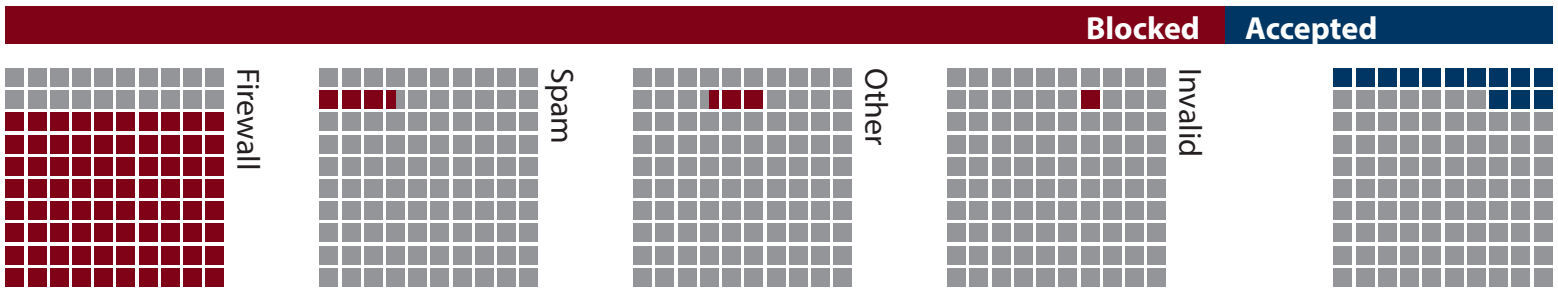
The network perimeter firewalls and core infrastructure process over 750,000,000 Internet traffic category matches

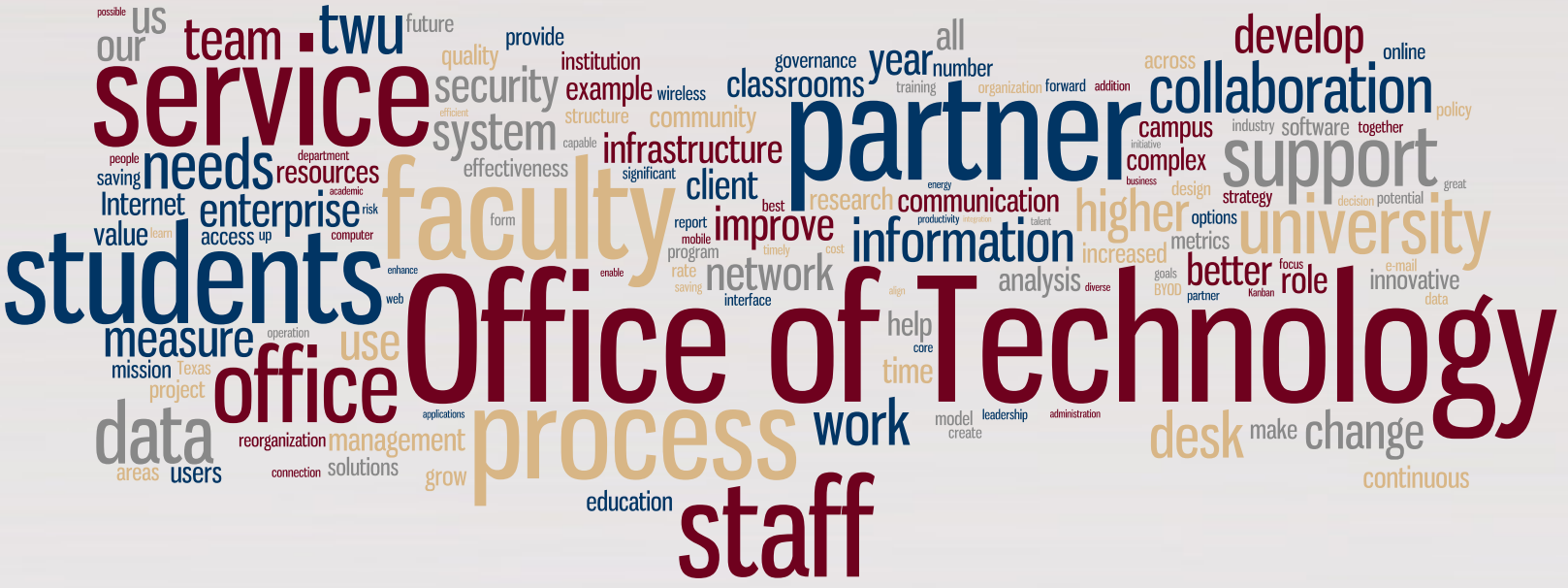
Wireless and dorm DMZ process over 400,000,000 Internet traffic category matches

68,000,000 known malicious or bad traffic attempts are blocked (90,000 per hour)

Over 34,000,000 web traffic hits sent to TWU public web servers

On Average the TWU E-mail Gateway Processed **7,667,551** Messages Each Month During Academic Year 2011-2012





The word cloud above was generated at Wordle.net from the text within this report. The size of each word in the cloud is proportional to the frequency with which the word or its cognates occur in the report. From the cloud we can glean themes such as service and partnership with students, faculty, and staff.

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Pioneering the Future