80% Technology Service Desk First Call Resolution
1.8x Increase in Network Storage
99.779% Average Uptime for Production Infrastructure Hosts

143 Physical Servers Operating Systems 418

<table>
<thead>
<tr>
<th>Year</th>
<th>Physical Servers</th>
<th>Operating Systems</th>
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<td>2009</td>
<td>113</td>
<td>442</td>
</tr>
<tr>
<td>2010</td>
<td>113</td>
<td>463</td>
</tr>
<tr>
<td>2011</td>
<td>113</td>
<td>324</td>
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<tr>
<td>2012</td>
<td>113</td>
<td>324</td>
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Density of Operating Systems to Physical Servers

Significant Changes

<table>
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<th>Category</th>
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<tr>
<td>Network Storage (TB)</td>
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<td>Virtual Servers</td>
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<td>Wireless Access Points</td>
<td>170</td>
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<td>440</td>
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<td>Classroom Lab Hours</td>
<td>49,549</td>
<td>71,580</td>
<td>130,959</td>
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<td>Open Lab Hours</td>
<td>183,970</td>
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<td>235,181</td>
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<tr>
<td>Kiosk Users</td>
<td>14,420</td>
<td>11,384</td>
<td>8,690</td>
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</table>

85% increase in hours of computer lab (all types) usage per fall enrollment over four years

Note: Data estimated using best information available at time of publication

As little as a year ago, I aimed to express our value in terms of quantitative metrics. Since then I have relearned what great people like Abraham Lincoln already knew: data can be misleading without context.

Big data is all around; people who throw around phrases like “data-driven decisions” are ubiquitous. The world of IT is especially allured by the promise of gains made possible through quantitative analysis. Such analysis can be helpful, but we have found that the data are better understood when talking with our partners.

In a numbers-driven world, we often lose our focus on fostering relationships. By talking to our partners across the institution, we do much to break down the silos that inhibit collaboration and communication, ultimately delivering a better experience for our students.

We are privileged to have the opportunity to serve our students, faculty, staff, state, and country. Each day we strive to live up to the privilege bestowed on us. After reading this report, I hope you are as proud of the Office of Technology as I am.

Robert B. Placido
Associate Provost for Technology & CIO
Service Mission: *Defining a Framework*

The Office of Technology has developed servant leadership as one of its core values. Partners across the institution have taken note.

**Ease of Collaboration**

The shift in values has forged stronger relationships within administrative units and with academic colleagues.

“We have made more gains in technology than ever before.”
—Gary Ray, Vice President for Enrollment Services

“There have been better relationships, better communication, and more transparency.”
—Camelia Maier, Associate Professor of Biology

“Collaborations are really everywhere; it is not just in academics. What I hear is how helpful the Office of Technology is in almost every sector.”
—Bob Neely, Provost and Vice President of Academic Affairs

**Democratizing the Decision-Making Process**

Maintaining relationships with a growing number of colleagues requires a framework for governance. In March 2013, the Office of Technology formed a committee to improve technology governance at TWU. The guiding principle behind technology governance is...
Leadership in the Office of Technology asked members on its team to submit at least five words that describe core values of the department. The responses were formed into a word cloud to illuminate a focused set of shared values.

that decisions must be informed by the university community for the purpose of linking technology investments to the university’s mission.

The Technology Governance Committee completed its work in three phases. The first phase was to review academic research and practice of technology governance in higher education. The committee considered a variety of approaches and on the basis of their review wrote a draft policy in the second phase. The final phase of the committee’s work is underway. The objective is to give the campus a voice in the technology decision-making process.

**Continuous Improvement: Leadership**

Technology is an umbrella word encapsulating telecom, programming, software, desktops, laptops, tablets, conferencing, networking, and custom mobile apps—a host of equipment and tools university colleagues use everyday to create, innovate, and move forward the mission of TWU. Positions in the Office of Technology all require high degrees of technical skill that need to grow as technology rapidly evolves. It is equally important for Technology to support its staff in honing their communication and leadership skills.
Students work in new and different spaces increasing demand for wireless network access.

Course content delivered online frees class meetings for discussions that may better develop higher-order thinking.

A Communications Umbrella

On the basis of a series of surveys that aimed to measure internal employee satisfaction, the Office of Technology identified two areas for improvement: compensation and communication. The institution has already begun a process for studying compensation. Meanwhile, the Office of Technology started a communication committee and a professional development series on leadership.

Recognition

The Office of Technology’s service framework is modeled from the top. Patrice Armor, Manager of Technical Programming, was awarded IT Manager of the Year through the Texas CIO Academy in 2013. She was noted for her dedication, professionalism, and willingness to go above and beyond.

Shrinking technology allows students to engage in new forms of scholarship and creativity.
Partners with Faculty: *Pioneering Assessment*

EDUCAUSE named “Improving Student Outcomes through an Approach That Leverages Technology” as its number-two issue for university IT in 2013. The Office of Technology can only meet this challenge by working with faculty to determine need and realize solutions.

**Scalable and Reliable Assessment**

In Fall 2012, Dr. Gray Scott and the Office of Technology co-developed a software solution to assess first-year composition. The software allows graders to assess students’ essays where each essay is blinded and assessed at least twice by different graders. Roughly a thousand essays are rated at the start and end of each semester. The software, code-named Minerva, opens up many more opportunities for educational research in the humanities. For example, doctoral teaching assistants of composition courses can better experiment with interventions and control groups. Dr. Scott and his students are currently studying stereotype threat mitigation.

“*Minerva enables us to measure progress on student learning outcomes more accurately and much more reliably than we had before.*”

—Gray Scott, Assistant Professor, English, Speech, and Foreign Languages
Tracking Experiences

TWU students are best-served by an academic program and university that is on the cutting edge of technology. This past year, the Office of Technology wrote a customized cloud-based app that allows clinical faculty in Dental Hygiene to chart student experiences in real-time using tablet computers. This software, code named Pioneer Tracks, not only adds greater validity to student experience data but also eliminates countless hours of manually entering and aggregating data for accreditation reports.

“The Office of Technology exceeded our expectations.”
—Amy Teague, Assistant Clinical Professor, Dental Hygiene

Electronic Curriculum Vitae

The academic leadership at TWU invested in SEDONA, a self-service web database application that allows faculty members to more easily maintain their CV. Over the last year, the Office of Technology collaborated with a faculty steering committee to implement SEDONA. This project involved 17 TWU graduate students entering 408 CVs over the nine-week summer semester. Training and development support will continue next year for faculty and support staff.

“SEDONA is a great example of IT stepping forward.”
—Bob Neely, Provost and Vice President of Academic Affairs
SEDONA is a self-service web database application that allows members to maintain their teaching, research, service, experience, development, credentials, and assessment records. Administrators may use SEDONA to automatically update school web pages; support accreditation; build rubrics to assess learning objectives; customize reports (including CVs); create database queries, web surveys, ePortfolios, and evaluations.

**Administrator Evaluations**

The Office of Technology worked in collaboration with the Faculty Senate’s Administrator Evaluations Committee co-chairs to develop a process for electronically distributing and collecting administrator evaluations.

“That was excellent work.”
—Camelia Maier, Associate Professor, Biology & Co-Chair of the Faculty Senate’s Administrator Evaluations Committee

**Spaces: Image Is Everything**

The Office of Technology increasingly plays a role in enhancing the university’s image from many points of view.

**Athletics**

When fans, officials, families, visiting teams, coaches, and the media attend athletic events at TWU, they expect Wi-Fi access to the Internet. Those who can not attend expect to engage via live stats and streaming event coverage. To help meet these expectations, the Office of Technology finished a project bringing fiber optic and Wi-Fi access to TWU athletic facilities.

“Technology is a necessary vehicle or mechanism for disseminating our great brand, particularly during national sporting events.”
—Jeff Bowerman, Assistant Director, Athletics Marketing and Operations

Student athletes rely on technology to promote their accomplishments.
Commencement Traditions

Commencement stands as perhaps the most revered tradition of the university experience and one with a high degree of visibility. Under the leadership of the Commencement Committee, the Office of Technology brought new resources to better support the technological aspects of commencement.

“The Office of Technology realized there was a role for them in leading the whole technology part—in a partnership sort of way.”
—Amy O’Keefe, Director, Commuter & Non-Traditional Student Services

Digital Signage

One sees digital signage almost every day—from billboards to sporting arenas to airports. Its ability to capture and focus the attention of passersby adds new possibilities to those in the impression-making business. The signs are easy to update and thus can convey current information. New digital signage was added in Admissions, Facilities Management, Music Building, Multipurpose Classroom Laboratory Building, Blagg-Huey Library, and in several locations on the Dallas and Houston campuses. The Office of Technology has stepped forward to support digital signage.

“Our new digital signage adds a refined look and high-tech experience when people come into our office.”
—Erma Nieto-Brecht, Director, Admissions


**Library Archives**

The Office of Technology is collaborating with the Library on the Woman’s Collection archival project and a digital repository. The collection needed its data migrated to a networked disk array, which is mirrored in multiple locations to minimize the risk of data loss for this important collection. The digital repository will make student posters, theses, and dissertations more accessible.

“We really rely on the Office of Technology to maintain and manage the redundancy and security.”
—David Schuster, Director, Library Information Technology & Technical Support

**Student Union**

The Office of Technology served in an advisory capacity to help renovate technology in meeting rooms within the Student Union. Union directors wanted to make sure technology equipment would be compatible so that students could easily plug in today and tomorrow—maximizing their investment. Students have provided positive feedback regarding the renovations.

“Every step of the way, the Office of Technology played a huge hand in helping.”
—Jason Titus, Assistant Director, Student Union

“The Office of Technology helped us make use of limited office space.”
—Kyle Voyles, Director, Student Union
Academic Research

The Office of Technology collaborated with the Office of Research & Sponsored Programs to offer faculty and students more research software and equipment, including better support for qualitative research.

“The Office of Technology took the lead on getting us needed resources.”
—Tracy Lindsay, Director of Operations, Research & Sponsored Programs

Accreditation

The Office of Technology played a role this year in the functional aspects of two significant documents developed for TWU’s reaffirmation of accreditation by the Southern Association of Colleges and Schools (SACS). The SACS Compliance Certification report and the Quality Enhancement Plan (QEP) proposal were structured with functionality in mind and were easily navigable using accurate hyperlinking with accessibility components built throughout. The documents made a positive impression on reviewers and other external colleagues.

“The SACS liaison, the SACS off-site committee, and colleagues from other institutions have complimented us on our electronic documents.”
—Barbara D’Auria Lerner, Associate Provost for Undergraduate Studies & Academic Partnerships and TWU SACS Liaison
Streamlining Processes: *The Look of Efficiency*

The Office of Technology strives to improve operational efficiency throughout the institution. Solutions that work take time and skill to develop. Technology personnel usually engage with staff who understand the functional side of the process to study how the process works, and then they suggest ways technology can improve the flow.

**Transcripts**

Building on standards set by the American Association of Collegiate Registrars and Admissions Officers (AACRAO), the registrar initiated a project to transform TWU’s official transcript. The Office of Technology delivered a product that was well-received by colleagues inside and outside the institution.

“They successfully translated what I needed and then delivered a product of which we can both be proud.”
—Bobby Lothringer, Registrar

**Changing Data Structures**

One outcome of the transcript transformation project was improving the student system data structures. The improvement resulted in consistent data allowing for a professional presentation. Delivering a quality product with a strong aesthetic is a hallmark of TWU.

“It was a very involved process, and it came out beautifully.”
—Sarah Kate Henderson, Assistant Registrar

Students use technology to keep up in a fast-paced world of new ideas and information.
Advancement

The Office of Technology helped to redesign the website for University Advancement and to integrate their fundraising and donor management software with other TWU financial systems. The work has resulted in clear benefits. As one example, now anyone can easily make a recurring gift.

“I know I’m not their only client, but I am treated as though I am.”
—Philip Trammell, Director, University Advancement

Orientation

Researchers continue to investigate the impact of orientation on student retention and graduation rates; and, while the subtleties of what works may still be in doubt, systematically helping groups of new students navigate roadblocks is fundamental to success. TWU orientations continue to grow in size. With new state testing requirements through the Texas Success Initiative, they also grow in complexity. Last year, the Office of Technology modernized the orientation process by developing a database-driven web application. The application allowed the Center for Student Development to systematically manage orientation data.

“The implementation of this application allowed for us to have a more seamless process.”
—Lindsey Hatter, Assistant Director, Center for Student Development
Student Fees

Each year Student Life constituents have to request funding through a student-led committee for the allocation of student services fees. The Office of Technology worked with the dean of students to automate the budget process. Together they were able to reduce the time to create budget requests, ensure their accuracy, and include more detail.

“What I respect about the Office of Technology is that they believe there is always a better way, and then they help make it happen.”
—Heather Speed, Associate Vice President for Student Services & Dean of Students

Protecting Research Data

Every institution’s Institutional Review Board (IRB) will impress on researchers the importance of protecting personal data. This year the Office of Technology offered a guide on how to protect data stored in a digital medium.

“The quick reference guide will really help research students and faculty.”
—Tracy Lindsay, Director of Operations, Research & Sponsored Programs

Online Education: Going the Distance

Many students take advantage of online classes and programs offered at TWU. Technological infrastructure and support services underpin this modern pedagogy. Continuing previous years’ efforts, the Office of Technology has worked to forge even stronger relationships with
the academic services and departments that support online education. TWU faculty and students have reported benefits of greater integration between technology and pedagogical support.

**Online Student Billing**

The Teaching & Learning with Technology (TLT) department and the Office of Technology worked to develop an automated system for billing distance education students. The report improves efficiency.

“*Some of what we can do now is just mind-blowing.*”
—Lynda Murphy, Director, Teaching & Learning with Technology

**Course Managers**

The Office of Technology integrated TWU’s learning management system with the student system, creating a process that matches faculty and staff expectations for course management. A course manager can now perform essential functions. This particularly benefits faculty working in hospitals and clinics.

*“The system now works the way administrators and faculty expect, improving outcomes.”*
—Bobby Lothringer, Registrar

**Distance Partnerships**

A new training and support collaboration between the Technology Service Desk, the Learning Technologies Support department, and TLT stands as another example of Office of Technology’s cultural shift. The three groups have created a new learning management
system (LMS) oversight committee to open communication channels and to create opportunities for cross-training and joint testing of upgrades.

“This fall was probably one of the better starts of the semester.”
—Lynda Murphy, Director, Teaching & Learning with Technology

In the same spirit of collaboration, Office of Technology teams on the Houston and Dallas campuses have worked with TLT to offer joint training sessions on their respective campuses. The collaborative training approach aligns with teaching and learning theories about scaffolding and other strategies for effective training.

**Online Tutoring**

In collaboration with Teaching & Learning with Technology, the Office of Technology systemized a method for online students to access Smarter Thinking, an online tutoring resource.

“The new process saves money, time, and a lot of frustration.”
—Lynda Murphy, Director, Teaching & Learning with Technology

**Enrollment Services: Data Flow**

The growth in applications, admitted students, dual credit students, and financial aid recipients, as well as increased compliance and reporting complexities are challenges that can be partially met with efficiency-focused technology.
Embed Personnel

Enrollment Services and the Office of Technology jointly created a new position to bridge the gap between technical and functional knowledge. This new position is producing numerous benefits, not the least of which is improving data validation processes. Making data consistent at the point of input saves hours of cleaning data for output in reports. The Office of Technology has similar employee partnerships with the College of Nursing and the Office of Student Life.

“By meeting on an ongoing basis, we stay ahead of the curve.”
—Governor Jackson, Director for Financial Aid

Commencement Data

Almost as soon as the deadline passes for students to apply for graduation, the commencement committee wants numbers and names. The Office of Technology helped streamline and automate that process.

“What used to take most of a day can now be accomplished in less than a minute.”
—Sarah Kate Henderson, Assistant Registrar

Interactive whiteboards allow instructors to digitize ideas that students present to their peers.
Eliminating Wasted Seconds

Admissions Processing worked with the Office of Technology to create a more efficient data entry process. What used to require nine screens is now accomplished on one.

“The new automation will help us keep pace with the growing demand.”
—Jeannie Rickey, Director, Admissions Processing

Data Modeling

The Office of Technology has helped Enrollment Services build on research from the College Board to create a model for retention.

“With IT’s help and College Board research, we’ve been able to develop a model, in which we’ve moved from a 67% first-year retention rate for freshman to 73% over the last two years.”
—Gary Ray, Vice President for Enrollment Services

Transcripts Online

Ordering transcripts is the first of many processes that the Registrar’s Office moved online. Online ordering existed before for current students, but the new system also serves alumni and prior students.

“The challenge of using technology to extend our services 24–7 has been a top priority.”
—Gary Ray, Vice President for Enrollment Services

1,342 videoconference classes were scheduled in 2013

The push to make videoconferencing technology self-service has made it more accessible, and the frequency of its use is growing rapidly.
Manage Growth: *New Frontiers*

After more than a year of planning and extensive testing, the Office of Technology achieved the final stage of an Oracle database upgrade, known as R12. Already colleagues across the university are realizing the benefits of the new technology.

**Manager Self-Service**

Manager Self-Service (MSS) is a new module made possible by R12. With MSS, the entire personnel transaction process is now electronic, improving efficiency and data validity.

“Manager Self-Service gives departments hands-on access to be able to do most steps independently.”
—Amanda Noday, Manager, Payroll

**Voluntary Benefits**

The benefits group in HR worked to set up new voluntary benefits for TWU employees. Previously, voluntary benefits were offered only through one provider; and the process for selecting these benefits was accomplished by meeting with benefits personnel.

“Together we’ve been able to greatly expand the voluntary benefits options.”
—Angela Cagle, Manager, Benefits
Student Health Services

Student Health Services, the Registrar’s Office, and the Office of Technology work together to comply with Senate Bill 62 requiring certain student populations to be vaccinated for bacterial meningitis.

“The Office of Technology has been helpful with getting us reports that we need.”
—Zane Santos, Systems Analyst, Student Health Services

Imaging Credentials

The Office of Technology continues to partner with colleagues across the university to help meet new imaging and archival needs. This year one of the bigger projects involved imaging and archiving faculty records.

“The Office of Technology has been very responsive to getting our needs met.”
—Colleen Sallee, Coordinator of Academic Budgets & Faculty Records, Academic Financial Services

Classroom Technologies: The Future Today

Technology in TWU classrooms and labs helps advance student learning and puts students in touch with technology they will experience in the workplace. Technology solutions in classrooms are needed in all disciplines from the arts to social sciences to the natural sciences.
Virtual Classroom Experiences

TWU is the first university in Texas with a TLE TeachLive system: a virtual classroom for students in teacher education. It utilizes an Xbox Connect and digital whiteboard to simulate a classroom of students, helping future teachers practice classroom and behavior management in a virtual environment.

"Many of my faculty push the technology envelope."
—Nan Restine, Dean, College of Professional Education

Visual Arts

The Office of Technology met with the faculty in Visual Arts to understand their technology needs, and were able to provide custom technology stations. These stations meet the pedagogical needs of the Visual Arts faculty while also preserving the aesthetic of their historic building.

"The new stations are more streamlined and serve our needs much better."
—Michelle Hays, Associate Professor and Chair, Department of Visual Arts

Biology Conference Room

The Biology conference room has been used for graduate seminars to present articles, research, and even images taken with microscopes.
Past student presentations required everyone to line up to look through the microscope; now the presenters can share their research on a large screen for all to view.

“Students presentations of their research on the large display is much better for their peers.”
—Camelia Maier, Associate Professor of Biology

**Reading**

The faculty in the Department of Reading have developed a classroom pedagogy where they present live content or recorded practices displayed on a projector screen. The Office of Technology listened to the needs of the faculty and supported their innovative pedagogy with custom technology configurations.

“Students in the classroom see the theory adjacent to the practice.”
—Matthew Moore, Classroom Technology Coordinator, Office of Technology

**Supporting a Tablet Revolution**

As with the explosion of Wi-Fi equipped mobile devices on TWU campuses, the tablet computer phenomena in classrooms has demanded a significant increase in Technology resources. It is not a direction anyone chose to move in; it is a cultural phenomena and technological revolution that the Office of Technology supports.

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284%
increase in hours of classroom computer lab use per fall enrollment over the last four years

571,005
hours of computer usage in classroom, department, and open computer labs during fiscal year 2012-2013

On average, open lab computer use has only increased 15% annually and department labs 29%, but classroom labs have increased 61%.
In one example, Teacher Education faculty take tablets into the field to use for assessment of student-teacher experiences. The Office of Technology helped develop a workflow and provided training to support Teacher Education. In another example, faculty are incorporating tablets into their classroom pedagogy for presentations of content in ways never before experienced. For this, the Office of Technology adapted many classrooms for the use of tablets.

“In our classrooms, we focus on making newly integrated technology as simple to use as possible.”
—Joe Kondras, Senior Integration Analyst, Office of Technology

**Large Lecture Sections**

To make large lecture sections effective, technology plays an essential role. For example, Professor Jack Gill creatively employs Tegrity, a lecture capture system, in order to better use the classroom time he has with students.

“Everyone I have worked with in the Office of Technology has bent over backwards to make it work, make it happen, make it right.”
—Jack Gill, Professor, Chemistry and Biochemistry
The first two weeks of the fall semester tend to be the busiest of the year for the Technology Service Desk. Since adopting more of the Information Technology Infrastructure Library (ITIL) practices, two metrics have shown significant improvements between 2012 and 2013.

Service: A Vision Realized

After transforming the help desk into the Technology Service Desk, an internal committee worked to develop new processes and procedures, and implemented a new incident management system. The new system provides better metrics and more validity for assessments: two critical components to meet the goal of continuous improvement and to provide accurate data for internal and external review, such as SACS accreditation.

Service Flow Chart

The Office of Technology’s service structure aligns with best practices in which most service requests are handled by a first-response team (the Technology Service Desk) while on-site needs are passed on to other teams in Client Services and projects are handled by the Enterprise Applications and Technology Infrastructure teams. The new structure is simple. Colleagues no longer have to figure out who to call. All of their needs will be handled from one place.

“The new system makes it much easier to submit a request.”
—Lynda Murphy, Director, Teaching & Learning with Technology

“I personally really like the online chat capabilities.”
—Mere Maddox, Assistant Director of Student Development and Family Services, Housing
A Model of Service

For colleagues who work with the Office of Technology, there is often a question about how to initiate a request for help or where to ask a technology-related question. The Model of Service diagram attempts to demystify the process: For optimal service, always start with the Technology Service Desk.

The turning point and movement away from a paper-based culture seems evidenced by the decline in student printer usage.
1,743,632
pages sent to the print server last year were never printed because of paper-saving technology

only 81% of pages sent to printers were actually printed last year

Environmental Conservation

Demand is increasing throughout the institution for paperless solutions. Over the past two years, the Office of Technology has supported paperless projects for Student Health Services, Athletics, Dental Hygiene, Student Development, the College of Professional Education, Fitness and Recreation, and Human Resources. The Office of Technology has again been recognized by the US Environmental Protection Agency as an Energy Star Partner, part of the Energy Star Low Carbon IT Power Campaign.

“The Office of Technology was crucial in our push to electronic health records. Their expertise and resources were necessary for the software interface and networking requirements.”
—Zane Santos, Systems Analyst, Student Health Services

Over the last four years technology has saved 9 million print pages from being printed, almost 25% of the total pages sent.

A student is using a print station to confirm that he would like to pick up a printout he sent to the printer. Rather than print every page that a student sends to the printer, the student has to physically walk to the printer and confirm the print job before the printer will print it.
Decisions: A Culture of Numbers

Higher education has developed a data-driven culture. The demand for data from colleagues on campus continues to grow, and much of their desired data are housed within protected systems. The Office of Technology fulfills requests for data while also complying with state and federal regulations and University policies.

Instant Data

SQL reports query live data, so they always return the most current information. To date the Office of Technology has over 1,200 SQL reports. These reports have given colleagues greater independence and autonomy to quickly retrieve the information they need.

“Anytime I need information that is not already in a SQL report, I just ask.”

—Rachelle Land, Senior Analyst, Undergraduate Studies
**Reporting**

Institutional Research and Data Management (IRDM) and the Office of Technology worked together to automate the Integrated Postsecondary Education Data System (IPEDS) reporting process, the preparation of which used to take weeks. Components of the reports can now be generated in minutes. More importantly, the process is more consistent and reliable.

“In every instance the Office of Technology has helped us with what we ask of them.”
—Mark S. Hamner, Assistant Provost, Institutional Research and Data Management

The Office of Technology’s salary per student ratio is well below Texas A&M, while their wage ratio is off this chart—at $50.76, it’s almost double what Technology spends on wages. Growing the wages category effectively provides more technology jobs for students, aligning with the TWU’s history to “learn by doing.”

**Budgeted Salaries and Wages Per Fall Semester Enrollment Fiscal Years 2009 – 2014**

Students with a strong background in technology can work as “virtual assistants” offering quality help in more places using fewer people.
The Office of Technology continuously analyzes the demand for its networking service on TWU campuses and to the Internet.

**Network: Eliminating Points of Failure**

This year the Office of Technology is working to establish a second path to the Internet. A partnership with the Denton Independent School District, the University of North Texas, Southern Methodist University, and others, is allowing TWU to add a fiber-optic line between Denton and Dallas along a different route from the current line. There is another project that aims to add multiple pathways between buildings on the Denton campus. Having two paths allows the Office of Technology to keep network services available even if one of the network lines were cut.

A culture of mobile devices is driving a sharp increase in the number of wireless users on the TWU network. The demand for Wi-Fi access has increased nearly 65% at the start of the fall semester compared to the same time last year.

The increase is attributed mainly to a project that expands wireless due to student demand.
Cloud-based Authentication

While the Office of Technology continues to make strides in keeping the three campuses connected to the Internet, some resources such as Blackboard are cloud-based and only require a connection to servers in Denton for authentication purposes. To keep Blackboard up even if the Internet connection is down, an authentication server was added at the point of TWU’s Internet connection. Blackboard will now continue to function off-campus in the rare event that both pathways from the Denton campus to the Internet should fail. The Office of Technology personnel continue to analyze systems: looking for and eliminating single points of failure and working to minimize interruptions in learning for a technology-dependent institution.
This visual abstract for an article, produced by the Office of Technology, contributes the results of the screen study to the literature.

The Scientific Method: How to Decide

The Office of Technology has incorporated literature reviews into the decision-making process. When the literature is exhausted, Technology staff employ a variety of research methods, experimental design practices, and data analysis techniques. The results are evidence-based, innovative technology solutions centered around the student experience.

Projector Study

Given a classroom of a certain shape and size with a known peak ambient light from sunlit windows, what size of projector screen and with what luminous capacity would be sufficient to avoid impeding a student’s performance? While much has been investigated in gaming, theatres, and watching TV at home, there is a gap in the literature about optimal parameters between the physical components for large display technology and student learning outcomes. The Office
of Technology felt that classrooms are a different venue with a different purpose and that there might likely be a difference in the optimal parameters.

The Office of Technology designed an experiment with random selection and random assignment, recruiting 201 student participants during the spring. The researchers measured participants’ ability to copy text from a screen, a very common task in classrooms. The more words with the fewest errors relative to a baseline measure of copy ability was used as an indicator of optimal conditions. The analysis of results corroborated the research hypothesis. When fixing the projector lumens at 1,000 lux relative to a room with an average 200 lux of ambient light, the optimal viewing angle was within 45 degrees of a straight on view and between 1.3 and 3.5 screen widths from the center of the screen—a different result from preference measures found in the literature.

“We realized how task performance measures would carry value over preference measures for classrooms, and then we found a measure to use.”

—Christopher Johnson, Principal Investigator and Sr. Business Systems Analyst, Office of Technology
Missing Chair Index

Each year the Office of Technology remolds a portion of classrooms across TWU campuses, keeping them up-to-date with technology. The results from the classroom projector study were applied to survey TWU classrooms and determine which seats fell outside the optimal parameters. Chairs that were outside the optimal viewing parameters were considered “missed.” This year, the Office of Technology added the missing chair index (MCI) as a parameter to its inventory of classrooms. This parameter now factors into the decision of which classroom will be remodeled next.

“This study enables a different kind of dialogue between faculty in the classrooms and the Office of Technology. Now we can better discuss how technology is being used to compliment presentations and how well it is being received by students.”

—Matthew Moore, Classroom Technology Coordinator, Office of Technology
Vulnerabilities: *Strengthening the Inside*

Continuously improving a solid security program is a high priority for the state and country. The Texas Department of Information Resource’s 2012-2016 strategic plan has security as one of its top priorities.

In one hour on a Friday in August, TWU had 46,000 computers blocked for suspicious activity on its network. One week in late August, the Office of Technology systems processed 680,000 good e-mail messages and blocked close to one million. These systematic attacks are only a portion of the digital security risk. The Office of Technology invited Michael Saylor, Executive Director for Cyber Defense Labs to give a guest lecture. In his talk, he said, “Almost all attacks in 2012 had a web component, and took advantage of a human element.”

**Raising Defenses**

The Office of Technology’s security systems provide a hardened shell that virtually surrounds the campus, but firewalls and guarded portals do not address the vulnerability of human error. One step the Office of Technology takes to reduce the risk from the middle is annual information security training. Last year, 1,517 faculty and staff participated in the training.
Password Resets

Research shows that password length plays the most significant role in effectively making passwords impossible to guess using password breaking algorithms and databases of pre-cracked passwords (i.e., rainbow tables). Long passwords pose a somewhat significant inconvenience, and so the Office of Technology has followed the lead of other high-profile institutions of higher education in developing a standardized minimum requirement for password complexity and management. The implementation at TWU added requirements for password complexity, length, and a 180-day forced reset. This was a large undertaking that affected everyone.

Traveling Abroad

Traveling overseas presents another set of risks for security. This year the Office of Technology worked with administrative and academic units to create a policy, processes, and pre-configured laptops for use when traveling abroad.

Analyzing Software

The Office of Technology does a risk assessment on every software package purchased. Last year over 400 risk assessments were completed on software ranging from tablet apps to core components for the enterprise financial systems.
Allies: Securing the Future

The Office of Technology routinely partners with external constituents to assess security and disaster recovery protocol. Networking with other personnel in security will further ensure threats are kept in check.

Security Testing

To ensure security measures stay effective, the Office of Technology contracted with the Texas Department of Information Resources to perform a security scan of TWU systems. Fishnet Security also tested credit card processing systems to ensure they meet Payment Card Industry (PCI) requirements.

A Security Network

In March, the Office of Technology cofounded a chapter of (ISC)² (International Information Systems Security Certification Consortium), the global gold standard for security system certifications. Through this partnership, the Office of Technology brings a globally-recognized organization to the DFW area.
The process of creating this annual report was full of rich experiences that served to strengthen the Office of Technology’s relationships and services. The 2013 year was a great success and this report highlights only a small selection of accomplishments and innovations. With 2013 already behind us, the 2014 year projects are even more ambitious. The word cloud below attempts to illustrate a number of meaningful projects that are underway in 2014.