strategic directions
2008 – 2013

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October 15, 2008

From: Maurice Leatherbury, Ph.D.
        Associate Vice President for Computing and Chief Technology Officer

To: UNT Community

Subject: CITC Strategic Directions Document

The information presented in the following *Computing and Information Technology Center Strategic Directions, 2008-2013* document represents the CITC's understanding of the services that UNT expects of the CITC now and in the near (five-year) future, or what we think the rapidly-shifting terrain of information technology in our society will soon demand of our services. While it doesn't list all of the services and projects we currently are working on, it does attempt to describe the major new trends and services that we think will affect the CITC's funding, staffing, and work priorities.

What follows is intended to serve as the starting point for a discussion of information technology's future on the UNT campus and, to the extent CITC provides services to other components of the UNT System, the future direction of those shared IT services. We don't want it to be construed as the end point of decisions that the CITC has already made about IT on campus, because the CITC exists primarily to serve the needs of students, faculty, and staff. In an institution as large and complex as UNT, though, it's difficult to know at any one time what the needs and desires of all of the CITC's constituencies are. We are therefore in danger of missing critical information that would help the CITC shape our services in the future. Thus we seek input into a shared vision of IT services that would inform the future direction of the large array of services that the CITC offers to the campus.

If you have suggestions about what's presented here, or have ideas about new services or products that the CITC should provide, please contact me (Leatherbury@unt.edu) or contact your department/college's representative on the Information Resource Council, an advisory group that soon will be reconstituted as the Information Technology Council. The membership in the IRC can be found on the IRC's web site, http://www.unt.edu/irc/.

Thank you for your interest. The whole staff of the Computing and Information Technology Center looks forward to serving you in the future that we will shape together.

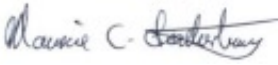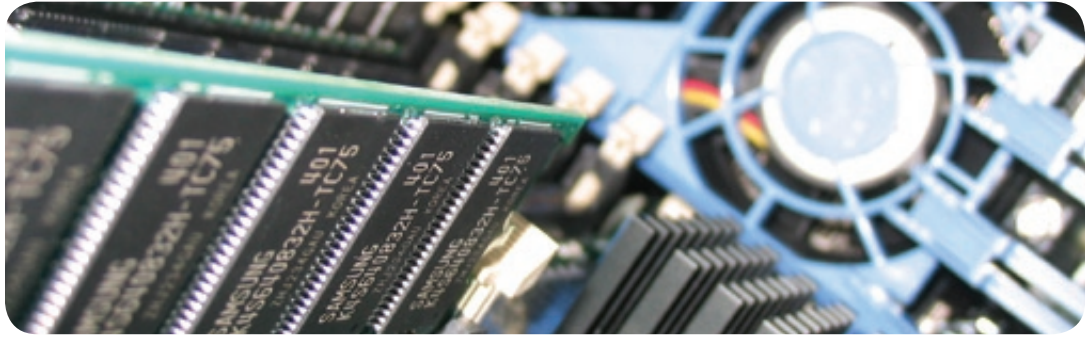Computing and Information Technology Center
Strategic Directions
2008 – 2013

Inside

introduction

The Computing and Information Technology Center (CITC) at the University of North Texas is the University's primary provider of computing and communications services to the campus. With principal offices located at the Discovery Park, Chilton Hall, the General Academic Building, and in the Information Science Building, the CITC serves not only the Denton campus but also the UNT Health Science Center in Ft. Worth, the UNT System, and the UNT Dallas campus (the CITC provides the administrative systems for all of those entities.) In addition, the CITC provides data communications support for the Universities Center at Dallas.

This document is intended to provide an overview of the potential future directions of the services that the CITC provides to the Denton campus over the next five years and in the area of administrative systems, to the entire UNT System, with emphasis on the most likely scenarios for those services. Although the CITC also provides UNT System-wide information technology ("IT") services, the strategic directions related to System operations are the subject of a separate document. Rather than a "strategic plan" that implies specific objectives and a time line, this document describes trends and UNT's response to those trends, as well as our assumptions about the role of IT in meeting UNT's mission. Many of the services or projects described can be funded by CITC, but new large initiatives will require special funding.

The focus on this document as well as of the CITC itself is the services that the CITC provides to the end user and how those services can help enable end users to more fully participate in meeting UNT's mission.
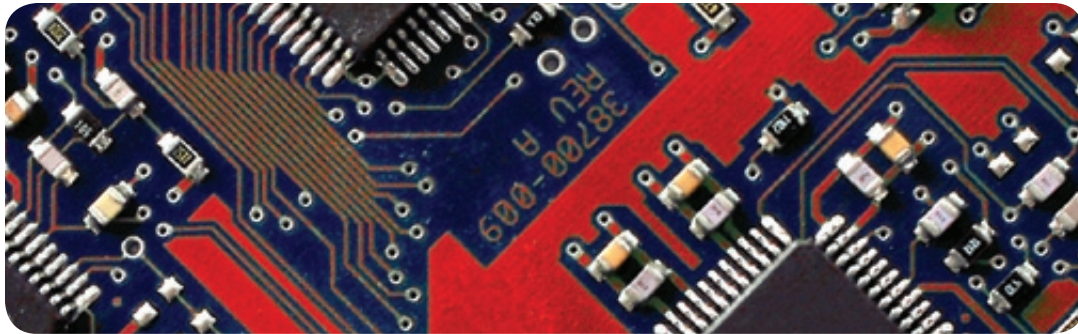
mission

The Computing and Information Technology Center's unique role in accomplishing the University's mission is to provide the primary university-wide, shared resources of computing hardware, software, classroom presentation hardware, research computing hardware and software, data and voice communications, software customization and integration services, information security services and professional IT personnel on campus. In addition, it provides these services in support of administrative and distance learning applications to the entire university system. The Computing and Information Technology Center provides computing and electronic communications resources when it can do so more effectively or more efficiently than separate units.

In addition to the traditional provision of host computer services and development of the data communications infrastructure, the center has a mission to provide high level technical services to support and improve the effectiveness of distributed support personnel.

The Computing and Information Technology Center's mission is accomplished in open cooperation and partnership with its customers and other service providers. The primary mechanism for facilitating communications between its constituencies and the Computing and Information Technology Center is the University Information Technology Council and its associated advisory groups including the Distributed Computing Support Management Team and the Enterprise Information System Program Management Group. Overall strategic directions for IT on campus are established by the Information Technology Steering Committee, a recently-formed group composed of the Provost/VPAA, VP for Finance and Administration, VP for Research and Economic Development, Chair of the ITC, and the Associate VP for Computing and Chief Technology Officer.
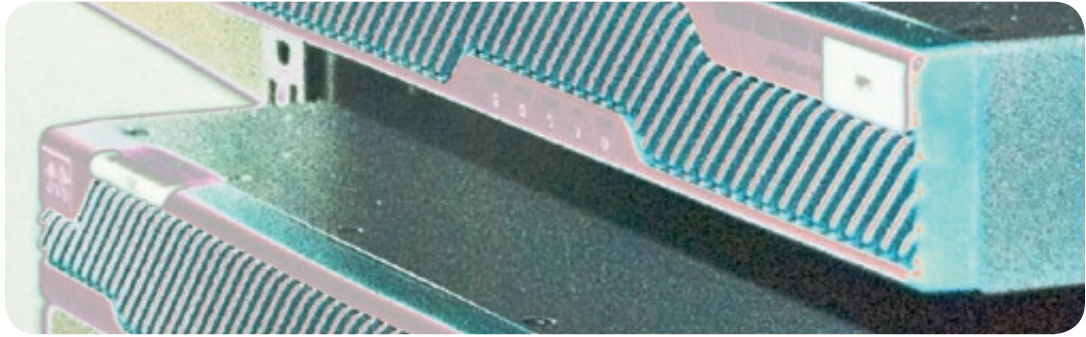
assumptions

In the rapidly-changing world of computers and electronic communications, projections about the university's IT future must be grounded on some assumptions about how the university will value and structure the critical assets that the CITC manages for the campus. The major assumptions we therefore make about IT's future at UNT are:

- The campus' need for and dependence upon information technology (broadly defined as computer technology and data and voice communications) will continue to grow.
- The university will continue to provide adequate funding for IT in order to maintain and grow the resources needed to keep up with the demand for services.
- Enterprise level IT services will continue to be concentrated in a centralized organization such as the CITC, with additional technology support services provided by distributed areas on campus.
- The university will continue to grow in both student enrollment and employee head count over the next five years.
- UNT's emphasis on growing its research funding will continue to be a major factor in the campus' planning for new services on campus.
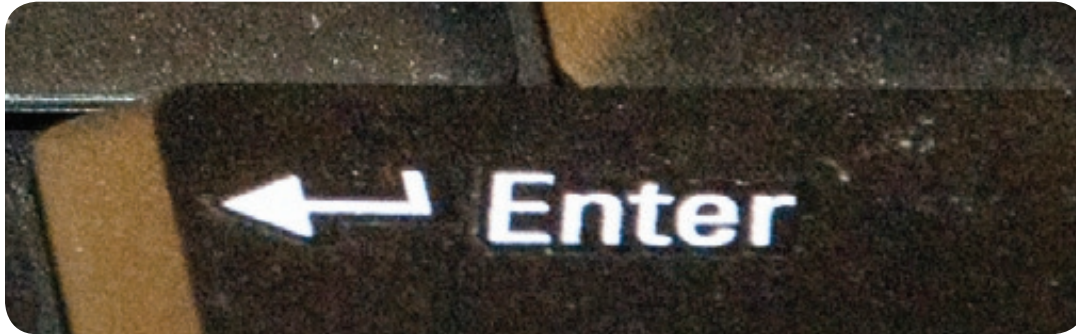
external factors

The CITC exists in many different organizational, political, and cultural environments, each of which impacts the CITC's services and sometimes its ability to serve its constituents. Chief among the external factors impinging upon the CITC's future are:

- As shown above, the CITC main purpose is to serve UNT's mission, and UNT's Five Year Strategic Plan for 2008-2013 is the major document describing how the University as a whole plans to make progress toward achieving the mission. That five year plan calls for (among other things) a number of objectives which CITC is committed to supporting:

  1. Provide communications, services, and programs designed to effectively transition new freshmen and transfer students to campus;
  2. Develop and implement comprehensive and integrated enrollment management and financial plans designed to increase the quality and diversity of the student body;
  3. Increase retention and facilitate timely graduation through enhanced advising and progress tracking programs;
  4. Increase infrastructure support for research faculty to facilitate effective operations and research productivity;
  5. Strengthen and promote the University's identity as a student-centered public research university through strategic and integrated communications, media, advertising, marketing, web-based technologies, and campuswide initiatives;
  6. Cultivate an informed and participatory University community through internal communication mechanisms that meet the information dissemination and feedback needs of students, faculty and staff;
  7. Improve philanthropic activities through new constituent relationships programs, collaborative work with key personnel, and coordination of development activities across the University;
  8. Enhancement communication and activities designed to increase involvement by alumni and friends in the life of the University, and to increase membership in the UNT Alumni Association and promote philanthropy;
  9. Develop and implement integrated management and resource allocation systems that align strategic unit-level planning, focus resource allocation,

provide timely access to relevant information, facilitate implementation and direction of action plans, and require ongoing performance evaluation and continual improvement.

- The 2008 Horizon Report (a joint project of the New Media Consortium and the EDUCAUSE Learning Initiative) reports that over the past five years of its studies of IT in higher education, three metatrends are apparent from its annual reports:

  1. The collective sharing and generation of knowledge, such as the early attempts at learning objects but which have been supplanted by mashups, new scholarship, and collective intelligence (such as is seen in Wikipedia.)
  2. Connecting people through the network, particularly with ubiquitous wireless technology, has enabled many other technologies such as extended learning, social computing, and social networking.
  3. The computer is moving into three dimensions, with the emergence of 3D tools and even physical 3D outputs. This trend has resulted in higher education experimenting with virtual reality and enhanced visualization tools for representing research data sets.

- Diane and James Oblinger (Educating the Net Generation. "Chapter 2: Is it Age or IT: First Steps Toward Understanding the Net Generation," pp. 2.1 – 2.20. EDUCAUSE, 2005) report that today's "Net Gen" students (those who were born around the time the personal computer was introduced) have very different expectations about technology than most faculty, staff and administrators. The implications of this dichotomy are:

  1. Net Gen learners don't focus on technology, but on the uses of technology. They want personal interaction with other students and faculty and only a moderate amount of technology in classes. Technology that enables certain types of mobile activities is likely to be valued, as is technology that increases customization, convenience, and collaboration.
  2. Net Gen learners work in teams and move seamlessly between physical and virtual environments. They use technology extensively to network and socialize, and use the Internet as a social technology to reveal their feelings and express their views.
  3. They construct their own learning by assembling information and tools from a variety of resources and learn by participating instead of through traditional lectures.
  4. The social nature of Net Geners makes them prefer interaction with materials, faculty, and other students to traditional lectures. They also crave immediacy, having grown up with rapid access to information and other people on the Internet.
  5. Net Gen learners, having been exposed to multiple media types almost from birth, are more visually literate than previous generations and don't learn as well from text as they do from graphics.

- Information technology security continues to be a problem in institutions of higher education, and the federal government is ratcheting up higher education's responsibility to monitor, log, and report network traffic. Recent federal

legislation imposes additional responsibilities on institutions of higher education for preventing illegal copying of copyrighted files, as well as a responsibility to provide alternatives to students for obtaining legal copies of those files. Additionally, spam threatens to overwhelm UNT's and indeed the whole world's e-mail systems: over 96% of the more than 100 million emails received monthly at UNT's electronic border are spam.

- The voracious appetite for data storage will continue to grow. Industry-wide, experience demonstrates that the need for data storage capacity increases at a rate of 60% a year. UNT's own data storage needs confirm that number: in two years we've gone from backing up 14 terabytes of data a week to today's 30 terabytes. Meeting that demand for increasing amounts of space to store important data at UNT will continue to be a challenge, as will the task of developing better techniques for provisioning, managing, and backing up massive amounts of data.

- Public calls for accountability in higher education grow rapidly, an example of which is Texas' Governor Perry's Higher Education Accountability System. That plan and almost all similar ones require tracking students throughout their school careers, thus imposing yet another technological burden of gathering and reporting data about higher education.

- The Texas Department of Information Resources believes that IT costs to the state can be reduced through the consolidation of services in large data centers, perhaps at the university system level, but also at the campus level as well. They also reported in a September 1, 2006 study (Higher Education Institution Data Centers: Inventory and Consolidation Analysis. Austin: Texas Department of Information Resources, 2006) that it appears that institutions of higher education in Texas aren't doing enough to protect their IT resources in case of disaster. The State Comptroller of Public Accounts has a project under way to consolidate ERP (i.e., systems such as UNT's Enterprise Information System- EIS) among state agencies, although higher education apparently will only be required to report at a system level into that system, not operate a single enterprise resource planning (ERP) system for all of a system's campuses.

In response to the abovementioned trends as well as others that are more general in nature, the CITC will move in the following directions over the next five years:

increase efficiency at UNT

Many of the goals of UNT's Strategic Plan call upon the university to improve the efficiency with which we operate. To meet those goals, the CITC will:

Aggressively follow a "Green" strategy for computing where possible.

The University's data centers are heavily populated with high powered servers and more continue to arrive monthly. The CITC recently installed a virtual machine (VM) farm that promises to reduce the number of servers significantly by concentrating as many as 25 virtual server instances on a single physical server, and the servers in that farm themselves utilize the latest generation of processors that are significantly more energy-efficient than older models. The contribution to "Green Savings" is significant in terms of floor space, air conditioning, and electrical power.

Regularly upgrade EIS.

EIS is the "engine" that drives UNT's administrative apparatus, providing business services to all departments on campus. The university has made a very large investment in the Oracle/PeopleSoft software that embodies EIS, both in terms of hard dollars (over $20 million) and in the "sweat equity" that UNT's staff invested in implementing the complex system and keeping it running. Oracle makes periodic improvements to the system, and UNT will take advantages of those improvements by keeping relatively current on Oracle's software releases. At the present time, we see no advantage to pursuing alternative ERP applications. UNT will continue to monitor Oracle's future product, Fusion, other commercial offerings and emerging open source alternatives.

Write or acquire enhancements to EIS where cost effective.

UNT's implementation of the Oracle/PeopleSoft suite of software applications has been "plain vanilla," meaning that we have made modifications to the out-of-the-box software only when needed for compliance purposes or to satisfy urgent business needs. The purpose of that strategy was to reduce the costs of implementation, to meet an aggressive implementation schedule, and to minimize the costs of upgrading to new versions of the Oracle/PeopleSoft product by avoiding re-customizing our locally-developed code with each new software release. We intend to continue being very cautious about customizing EIS, but will develop or acquire customizations that bring real added value to our users or to the university's business processes. In FY2009 add on applications in support of electronic forms, grant time and labor costing, and international student initiatives are under consideration.

Reduce the number of software environments that we have to support.

The Texas Department of Information Resources (TX-DIR) report cited earlier noted that inefficiencies are inherent in IT organizations that try to support multiple software environments performing essentially the same tasks. For that reason, the CITC ceased supporting most of the Novell family of products that we relied upon until recently, including GroupWise and Netware file and print servers, and will continue to move those services to the Microsoft family of comparable products. That move will result in a single software environment for faculty and staff e-mail and for file and print services on campus.

Consolidate servers in a secure, reliable data center.

The migration of file and print servers to a Microsoft platform, described above, provides an opportunity for UNT to improve its efficiency by consolidating multiple servers and locating them in the CITC's facilities, which are superior to distributed areas' computer rooms since the CITC's computer rooms have better physical security as well as backup power and air conditioning. Starting in FY 2009, the CITC will offer a service to distributed areas on campus that will consist of hosted virtual servers, associated storage area network storage, and regular backup of the files on the servers. The service will be offered at fees that will be lower than the actual costs to the distributed areas of purchasing and running the hardware needed to service their users, with greater benefits. The CITC, though, will not assume the tasks of supporting the distributed areas' end users: that responsibility will remain with the distributed computing support units.

Improve the CITC's ability to manage projects.

At any one time, the CITC has up to 200 different projects either actively being worked on or defined as pending work when our staff has time and resources to tackle those projects. The sheer volume of those projects and the wide diversity in their scope and cost make it almost impossible for the various levels of management in the CITC to either know the status of the projects or to accurately ascertain the priority that each project should be given relative to the demands on the CITC's services. For that reason, and because project/portfolio management ("portfolio" in IT terminology refers to the list of projects that the IT organization has in progress or under consideration) is considered a best practice for IT management, the CITC spent nearly a year in investigating and selecting a project/portfolio software package. We have selected Microsoft's Project and its Portfolio Manager systems to implement our project management system and are in the final stages of implementing Project, with Portfolio Manager planned to be brought up by the end of the 2008 calendar year. Those implementations will require that both the CITC staff and CITC customers learn and adopt new practices for selecting and working on projects that the CITC undertakes. As part of this effort and as prescribed by the DIR, a project management policy for IT projects is under development as are internal standards and classroom education curricula for project management principles and for utilizing the Microsoft Portfolio and Portfolio Manager software suite.

Support best practices of IT service management.

CITC's Academic Computing and User Services supports the IT problem tracking system utilized by most computing support

units on campus for the coordination of IT support at all levels of campus operations. The CITC, in coordination with distributed computing managers on campus, have upgraded that system to BMC's Information Technology Service Management suite of applications. That suite utilizes what are considered to be the best practices in IT service management and conforms to internationally-accepted standards. Over time, as the CITC's internal processes become better rationalized and our IT environment grows even more complex, we intend to make better use of ITSM to improve the services we provide to the campus.

Increase business analysis services offered to administrative customers.

During the implementation of EIS many analytical responsibilities including configuration, system administration, analysis of requirements, design of processes, investigating use of the application, and evaluation of the impact of patches and fixes on business processes were transferred to the functional areas of UNT (the Registrar, HR, Budget, etc.). While this mode of operation has worked for some areas, other areas are not able to provide the ongoing analytical services to manage and enhance the application. This has been a particular problem for small departments and departments that have experienced turnover. We would like to expand the Administrative Information Systems analysis services offerings for customers to address this need for CITC-provided and supported expertise on PeopleSoft's use in our business environment.

Continue extension of electronic administrative capabilities to the end user.

UNT still has a number of paper form driven administrative processes: these processes are inefficient, slow and labor intensive. CITC will work cooperatively with our administrative users to enable end users (the sources of business transactions) to utilize EIS and other electronic forms technologies such as SharePoint for many of those processes. Specific examples include personnel actions, employee on-boarding, and IDO/IDT's.

Improve the management, storage, and accessibility of electronic records.

Like all other state agencies, UNT has a records retention policy that applies to both printed and electronic records. Among the electronic records that must be classified, retained, and destroyed on a regular basis are e-mail correspondence, and to date the responsibility for managing those records has been assigned to each faculty and staff user on campus. However, that "solution" is very time consuming and not manageable since many users aren't very cognizant of records retention policies. One solution that attacks the retention of e-mail records problem is to centralize the storage of e-mail messages such that end users don't have to archive those messages on their own disks or on network drives that are scattered across campus. The CITC has purchased such a software package and will be implementing it over the 2008-09 school year.

Expand the use of UNT's new imaging system.

Another area of e-records management, storage and accessibility of those records, has recently been improved by the implementation of the ImageNow imaging system. Initially targeted at the offices that used a predecessor imaging system, ImageNow will be made available to other departments on campus as the CITC's ability to support those departments improves (an additional staff person has recently been hired to support imaging.)
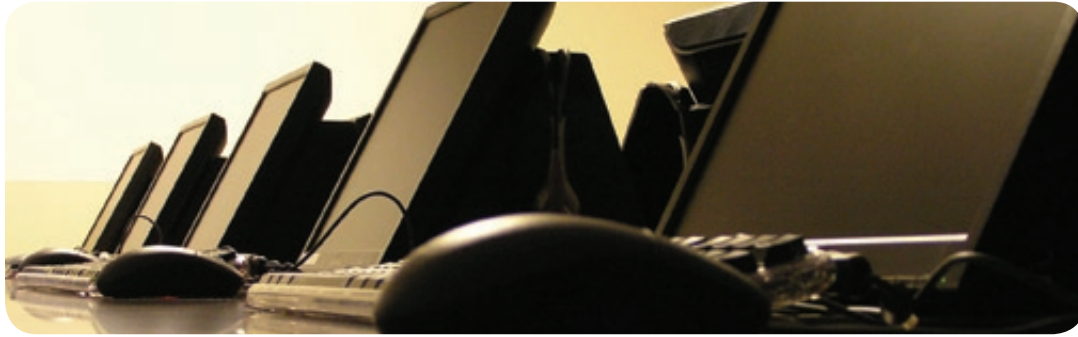
maintain and improve UNT's information technology infrastructure

Although the average user on campus will not be aware of the direct benefits from what the CITC does in regards to UNT's information technology infrastructure, "keeping the lights on" is absolutely essential for UNT's continued success in using information technology. To that end, the CITC is planning to:

Upgrade the campus data communications infrastructure.

Data communications is the lifeblood of IT for without the ability to communicate with computers across campus and indeed across the world, we couldn't get our jobs done. Our data communications infrastructure, in particular the approximately 800 switches and routers on campus, are reaching the end of their lives, most having been purchased over five years ago. Funding has been provided ($600,000/year at a minimum) to replace those aging pieces of hardware and work started in the 2008 fiscal year to perform the upgrade. In conjunction with the hardware replacements for the wired and wireless networks, we will be making structural improvements to both networks in order to improve reliability and to increase their overall capacity and usability. The backbone of the wired network will be upgraded from a 1GB backbone to a 10GB backbone, significantly increasing the capacity of that network. The wireless network will be migrated from its current 802.11b configuration to an 802.11b/g/n configuration which will significantly increase the speed and capacity of the wireless network.

Upgrade the EIS infrastructure.

The CITC received additional funding in 2007 to replace end-of-life servers and storage area networks and the bulk of that hardware refresh was accomplished in conjunction with an upgrade to PeopleSoft's "LS" (student and HR) system. In FY2009, CITC will complete that project by upgrading its aging Intel-based servers. But like all other computer hardware, servers will have to be replaced periodically (approximately every four to five years) in order for EIS to continue operating reliably.

Improve the reliability of the IT infrastructure on campus.

Fulfilling this goal will take several forms, including maintaining our redundant data communications links to the Internet, replicating data in real time or near real
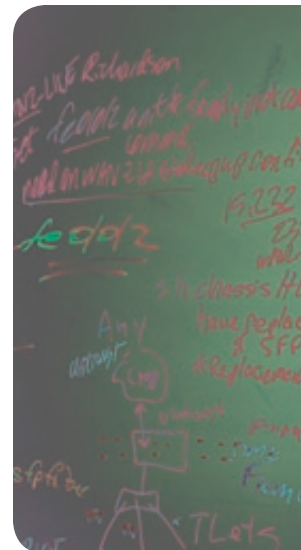
time between the main campus and Discovery Park, and operating redundant servers at both data centers. Our goal is to have data storage at both our main computing facility on campus in the General Academic Building and in our data center at the Discovery Park and have all mission-critical data written to both sites nearly simultaneously. If either of the sites gets destroyed or is even temporarily rendered inoperative, we could resume operations at the alternate site. We have made significant progress in establishing the desired redundancy on both our EIS and Blackboard systems and will spend FY2009 upgrading our Web, Exchange and Active Directory systems to have similar redundancy.

## Provision new facilities with voice and data communications.

In response to its growing enrollment as well as a shortage of dormitory, classroom, and office space on campus, UNT consistently builds new buildings: for example, two new classroom buildings are currently either under construction or soon will be. The Communications Services division of the CITC assists Facilities in writing specifications for the voice and data communications infrastructure for new buildings, checks on the quality of the wiring work done under contract, and connects new buildings to the campus' network.

Improve connectivity between the main campus and Discovery Park.

Fiber optic communications line connectivity between the main campus and Discovery Park is vital to providing network services between the two campuses. Currently, the primary data connection between the two sites is a fiber cable that carries large volumes of data traffic between the data centers, such as backup data and replicated database traffic. In the event of a natural disaster or other type of disruption (i.e., recent fires and past tornado damage), the fiber is vulnerable to damage because of its current positioning—it is strung on poles above ground. To mitigate the effects of a disaster, the CITC is evaluating methods to provide a secondary path and underground fiber connectivity that will improve the feasibility and reliability for delivering redundant network services between both campuses.

Establish a cold disaster recovery site and implement data connectivity.

Business continuity planning is a vital component of the CITC's disaster recovery services. The current disaster recovery scenario relies on our primary and secondary data centers to provide recovery services in the event of a disruption at either center. The CITC is evaluating the feasibility of provisioning a cold site recovery operation at an external location that will allow services to be re-enabled if there is a loss of both the primary and secondary data centers simultaneously.
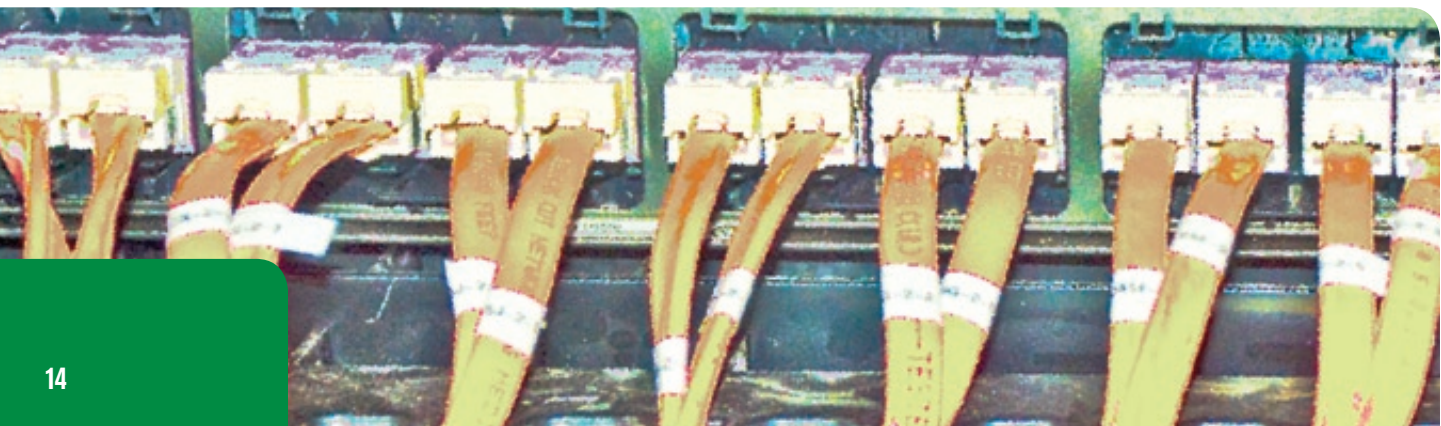
improve communications with students, faculty, staff, and alumni

Many of the goals of UNT's Strategic Plan call for either increasing or improving UNT's communications with various constituencies. To meet those goals, the CITC's strategic directions include:

Supporting PeopleSoft's Constituent Relationship Management module.

Already under way, this project will result in UNT's being able to define marketing/messaging campaigns, send materials or electronic communications, track the responses to the communications, and measure the effectiveness of campaigns. Initially, the CRM effort is directed toward improving UNT's graduate and undergraduate student recruitment program, but over time it will be expanded to include other purposes such as student retention, student self service support (AskUNT), advancement, and general marketing of UNT.

Implementing a Web content management system.

Like most other universities' Web sites, UNT's web presence contains inconsistencies in format, out-of-date information, and lacks information that frequently is available in printed form on campus. A major contributing factor to those failings is the difficulty that the average potential contributor to UNT's Web site has in designing Web pages and publishing material on the site. Web Content Management Systems (CMS) remove many of the obstacles that non-experts have in posting materials on Web sites and our goal is to select such a system, train users on its use, and to make the task of editing or creating content on our Web site as easy as using Word. In conjunction with URCM, the CITC is currently identifying the problems with Web development on campus and how best to solve those problems. We expect that a CMS will be selected and implemented in selected departments by the end of the 2008-09 school year.

Improving internal UNT communications by providing collaboration tools such as Wikis and discussion groups.

There are numerous examples of ad-hoc discussions around various issues on campus that could be conducted using electronic tools, ranging from the infamous "Scrappy" mascot discussion a number of years ago to the extended discussion of the Academic Strategic Plan. Such

discussions as well as wikis (collaborative development of content) are not well-supported by the technologies we have now, although we do have wiki software in place. Our solution for providing those technologies is Microsoft's SharePoint software, and we have installed a robust hardware environment for that package, installed the software, and hired two dedicated SharePoint support staff. Thus, we expect that we will have a service that will serve the campus well, and our plans are to expand the SharePoint service as usage demands.

Improve student academic career planning and course demand forecasting.

This fiscal year, we will partner with the Registrar's Office to implement Miami Universities' u.direct software application that will allow students to plan their entire academic career and provide the campus information about student plans that can be used to drive curricular offerings. That same partnership effort will implement u.achieve, software which will allow students to perform self service degree audits in order to determine the remaining courses in their degree plan.
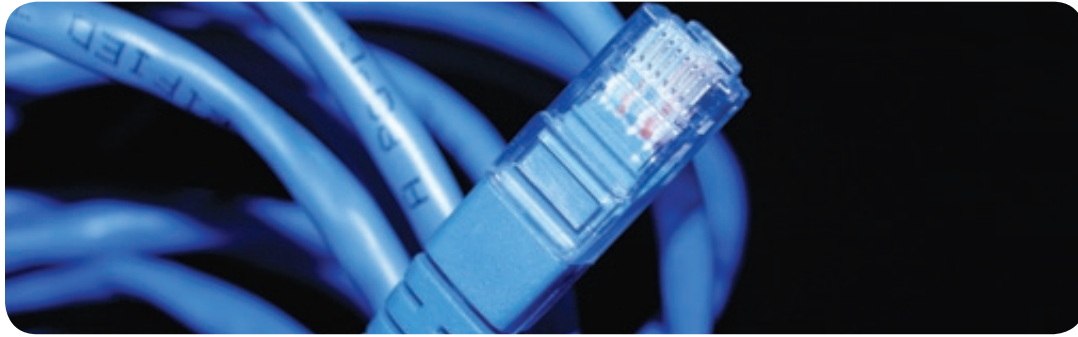
improve the quality and range of data that are collected and reported

A major initiative within the CITC is to improve the University's management information system, including the development of "dashboards" for upper management to get immediate data about UNT's performance on key indicators. A number of goals are associated with that initiative:

Continue to expand and improve the Cognos fact book.

UNT's Fact Book is now being published in parts using the Cognos ReportNet business intelligence tools that were acquired in 2006 (see http://www.unt.edu/ir_acc/Fact_Book/Fact_Book_2007/Degree.htm for an example of such a report.) Our Cognos license allows us to utilize their software to deliver the fact book to anyone on or off campus without paying per-user fees, and the tool is well-suited to drilling down to specific data about UNT and its operations. The office of Institutional Research and Accreditation, in cooperation with Administrative Information Systems, is responsible for preparing the fact book, and the CITC supports their efforts by extracting the needed information from EIS, putting it into our data warehouse, and assisting in the development of content. However,

much useful data, such as annual report data that is gathered by the VPAA's office, is not in EIS and consequently not in the data warehouse. We would like to help various departments on campus move their data to the data warehouse so that the superior reporting and display tools offered by Cognos can be used to report and analyze the data.

Make additional Cognos reports available to the campus community.

A major project within the CITC at this time is to provide both the System offices and the Denton campus' offices with business intelligence reports that will improve decision making at the University. Using Cognos tools, we expect to have a robust and user-friendly suite of reports that executives can easily and quickly access for such data as average class size in an academic department, a comparison of expenditures in a budget account from this year and last year, and the number of employees at UNT who are reaching retirement within the next year. Additional staffing provided by increasing CITC's budget will allow us to hire four additional programmers in FY 2009 to support that initiative.
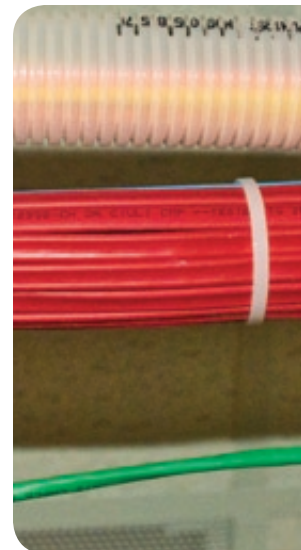
Develop scorecards and dashboards that present data to senior administrators and decision makers in more visual and summary formats.

In cooperation with the Budget Office and Institutional Research who are championing and directing the initiative, the CITC is developing scorecards and dashboards that display critical institutional and system data. These services should allow drill down to supporting detail data as well as extraction of data for further analysis. This involves the selection and implementation of visualization tools as well as the continued enhancement of the UNT data warehouse to supply the data. Identifying, sourcing, and transforming the data required to support the visualization is a significant part of this effort. Microsoft and other vendors in this space estimate that data assembly can constitute as much as 80% of the effort required. In FY09 UNT will complete the Key Performance Indicator Report, a scorecard providing key measures for the Chancellor, as well as the initial phases of a UNT dashboard.

increase research at UNT

Listen to research faculty's needs for computational research and respond with appropriate technology.

The CITC's Academic Computing and User Services department has acquired and supported a number of technologies over the years whose specific goal was to support funded research on campus. Technologies such as cluster computing, large inexpensive disk storage devices, and more recently a large memory server support researchers with needs for computationally-intensive capabilities that aren't available in their own departments. The direction that our research computing support group takes is primarily determined by contacts that that group makes with individual faculty members, through an informal network of such researchers on campus. However, Academic Computing held a meeting in spring 2008 with computationally-intensive researchers on campus to gather additional data about their needs and their vision for computation research support and that meeting has resulted in our identifying data storage as something those researchers need, in addition to access to more CPU's.

Increase the number and range of computer clusters that the CITC provides to researchers on campus.

As noted above, researchers who have high needs for computing power on campus have told us that we should significantly increase the number of CPU's that are available to themselves and their peers. Hence, we have initiated a feasibility study to determine what types of computers would best serve our researchers, what their data storage needs are, and how much funding will be required to provide the hardware and software those researchers desire. This project will require funding from outside the CITC's own budget in order to accomplish this goal.

Foster the use of high performance computing in research by prototyping new technologies on campus.

Most research computation at UNT is done at the individual faculty or department level with computing resources being acquired through grants. As noted above, though, the CITC has pioneered some technologies used in research such as clustered computers (important to computational chemistry.) The CITC sees its role in supporting research to

listen to the faculty (as described above,) to support technologies that are not yet mature enough to reach the individual researcher's attention, to provide facilities to starting researchers or graduate students with no funding, and to fill in gaps in computational research computing where we can afford to make a difference.

Support quantitative research by offering high-quality methodological consulting and managing and distributing commonly-used statistical and mathematical software packages.

CITC's Academic Computing and User Services department will continue its historical role of providing high-quality consulting services in support of research data collection and data analysis. This includes continued support for applications such as SAS, SPSS, Matlab/Simulink and other centrally-funded software packages, as well as development of online survey technologies and integration of data management services for generation of source data collections. As new statistical and mathematical software packages become available, ACUS will (as in the past) evaluate them for their applicability to UNT's research environment and will adopt them if they prove to be of high enough value to justify their support.

Support research data visualization by developing a Research and Visualization Environment (RAVE).

CITC's Academic Computing and User Services department is working with researchers to compile a set of hardware and software tools to allow visualization of computational results and measured data. Visualization is a key component of developing further scientific hypotheses and to present research findings within professional circles as well as to the general public. ACS is working with researchers to determine what tools will be most useful for visualization and will provide the facility and support that will enable researchers to utilize those tools to display their research results.

respond to students' desires to be connected at all times

Communicate important university information to students via their cell phones.

As noted earlier, a trend among students is to increasingly rely upon their cell phones for their communications. Several phone companies as well as other types of companies are making technologies available that enable organizations such as UNT to easily broadcast voice messages or text messages to large groups of users. For example, a faculty member could use the service to notify students in a class that the class has been cancelled for the day. In response to the need to communicate in emergencies with students as well as with faculty and staff, the university contracted with BlackBoard ConnectEd in 2007 to subscribe to their broadcast service. That system has been used twice since its inception and is tested on a regular basis to insure that it is meeting the goal of rapid, comprehensible emergency communications. We are also investigating the potential to use BlackBoard ConnectEd (or a similar product) to communicate

routine messages that would be important to students, on an opt-in basis. We are cognizant, however, of the potential for those messages to be regarded as another form of spam as well as the fact that students pay for receiving messages, so we will have to put into place controls over the type and frequency of messages sent to students' cell phones.

Implement Web technologies that reformat content to accommodate cell phones.

Increasingly, students as well as faculty and staff use their cell phones or "smart phones" to surf the Web, but unless Web servers format their content for cell phones' small screens, the user finds the experience frustrating. Some of UNT's technologies do recognize cell phone users and accommodate the restricted sizes of cell phone screens, but most of our Web servers don't do so. The Web content management system described earlier should have the capability of reformatting Web pages for cell phone users.

Upgrade student email.

A contract was concluded in October 2008 that will provide all students with Microsoft's Live@EDU email solution for higher education. That service will replace UNT's much-maligned EagleMail student email system with an email system almost identical to the faculty/staff Exchange mail system. Selected in consultation with Student Government, the service also provides personal storage space, calendars, online workspaces, mobile alerts, document sharing, instant messaging, blogs, videoconferencing, mobile access and address books, all accessible on Windows, Mac, Linux and mobile devices.

develop new learning tools and delivery methods

Implement new technologies such as podcasting and online collaboration systems.

UNT's standing as the largest and arguably the best provider of distributed learning in the state has been earned over a long period, starting with Teaching with Technology Grants that were awarded to faculty members at least eight years ago. By encouraging faculty members to adopt new technologies and supporting those technologies, in particular WebCT/Blackboard, the campus earned its hard-won reputation of providing superior online instruction. We want to continue the tradition of supporting our faculty's use of innovative and instructionally sound technologies by trying out new technologies such as podcasting or live audio and video collaboration tools like Horizon Wimba (both of those technologies are available now at UNT.) Working with the Center for Learning Enhancement, Assessment, and Redesign (CLEAR) CITC will assist the campus in choosing and implementing new technologies that promise to make a difference in learning and communications on campus. The university has already started the implementation of Apple's iPod University service and the CITC will support that implementation. The WebCT/Blackboard contract has been renewed and new functionalities will be added as they become available from the company.

improve information security at UNT

Educate students about the consequences of the unauthorized transmission of copyrighted materials.

Trade associations such as the RIAA and MPAA have mounted a concerted effort to make institutions of higher education responsible for the actions of their students when those students distribute copyrighted materials (music, motion pictures, games, etc.) without permission. In the past, UNT's efforts to stop or at least minimize illegal file sharing consisted of educating students about the illegality of their actions, throttling the bandwidth used by the most common file sharing programs to make it difficult to efficiently transmit files, and implementing a technology (Copysense) that purports to actually block the transmission of copyrighted files while allowing other files through. We implemented that device in summer 2007 but in the summer of 2008, UNT outsourced network services for students living in university housing to a third party company, thus removing the Copysense device from students' Internet access. However, we continue to address the copyright abuse issue through network monitoring and bandwidth control on the UNT network, we are expanding our awareness program to ensure that the UNT community understands their rights and responsibilities regarding the use of copyrighted materials, and we are currently implementing a new information security policy and participating on the committee that is drafting the new Student Code of Conduct to ensure that the university's stance on copyright infringement is clear. In addition, we work with Apogee, the company who is currently providing network services to students residing in university housing, to ensure that take down notices from copyright holders are addressed in a timely and appropriate manner.

Increase security training and education of faculty, staff, and students.

Although most press reports regarding computer security threats concentrate on viruses, worms, etc., the simple truth about IT security is that most breaches are caused by ignorance or negligence of computer users and/or computer administrators. If machines are patched regularly, users take proper precautions about sharing data or exposing their machines to theft, and administrators take the steps that are readily available to protect their machines, IT security breaches would be rare. Thus the key to improving security is to educate our users about their responsibilities and the things they can do to protect themselves and the university from miscreants bent to stealing information. Our strategy therefore is to step up our educational efforts, with the goal of reaching everyone at UNT at least once a year with the training needed to keep us secure.

Increase network security.

The campus network is currently configured to protect university computing resources from a variety of known threats. In addition, network monitoring devices have been implemented to allow for early detection of threats and remediation of incidents. However, as new vulnerabilities arise, the network must be configured in a manner that will allow it to be adaptable to prevent new incidents. To help improve UNT's network security posture, CITC will consider new methods for protecting the network, such as the implementation of a campus VPN, zoning and segmentation of the network based on functional security requirements, the implementation of network access control (NAC) and increasing the rule set on the campus border firewall to reduce the risk of threats infiltrating the network. In addition, enhancements to the intrusion detection system and implementation of the web security assessment tool will be made a priority as we continue to improve our efforts to protect the computing environment.

Data Security.

An increasing number of regulatory standards and laws govern the use, distribution, and control of sensitive university data. In response to those standards and laws as well as to protect the integrity of UNT's computing resources, has purchased a software package (McAfee's Total Data Protection) that allows to implement encryption on university machines and to control the flow of data to external devices and network endpoints. That software will be installed and made operational over the 2008-2009 school year. We will also implement software to help classify and control university data, and will conduct an inventory of sensitive data on campus.

### Implement Computer Access Modification System (CAMREQ).

The CITC has been working with Human Resources and Financial departments on campus to implement a computer system which will allow departments to request or modify computing access for new and current employees. The system should be made available to authorized personnel within the general UNT community by mid-fall semester of 2008. Implementation of CAMREQ will resolve problems associated with the slow provisioning of computer ids (EMPL ID and EUID) for new hires, and will also assist system and network managers in the timely removal of computing access for employees who no longer need such access.

improve the IT experience at UNT

Provide high-quality Helpdesk services to students and employees.

Access to IT support services is of critical importance to the students, faculty, and staff of the University. While desktop support to most faculty and staff on campus is provided by distributed units and those units' own helpdesks, the CITC provides a central helpdesk operation that provides assistance to all UNT users on those IT services provided by the CITC (EIS, WebCT Vista, e-mail, data communications, etc.) The CITC helpdesk also uniquely serves as students' access to assistance on computer-related issues of all types. Because of its role as a "broker" of IT services between users, the CITC, and distributed support units in many cases, the CITC helpdesk will continue in its role as an advocate for computer users trying to use the campus' IT infrastructure and services.
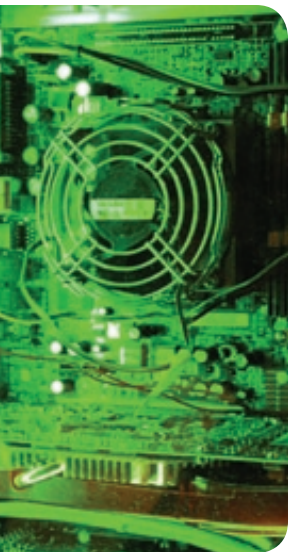
provide effective learning space technologies

Classroom Support Services (CSS) maintains the standard instructional equipment in general-purpose classrooms at UNT's Denton Campus. Toward that end, equipment is maintained or replaced on a rotating basis with an emphasis on reliability and technological relevance to current teaching methods. To achieve those goals, CSS as well as Academic Computing and User services will:

Design and support classroom technology on the campus.

Learning space technologies emerge and evolve at a rapid pace and Classroom Support Services takes great care to balance campus needs for classroom technology with the available budget. CSS carefully listens to comments by users of equipment in the supported classrooms, evaluates those expressions of need, and selects equipment that provides effective learning space technologies. Generally, technology refreshes are accomplished every three years, with some additions of new equipment in intervening years as demand dictates (such as sound capture equipment to support UNT's iTunesU initiative.) CSS will continue to provide that superior service to the campus, assuming that the current funding model (student technology fees) remains essentially unchanged.
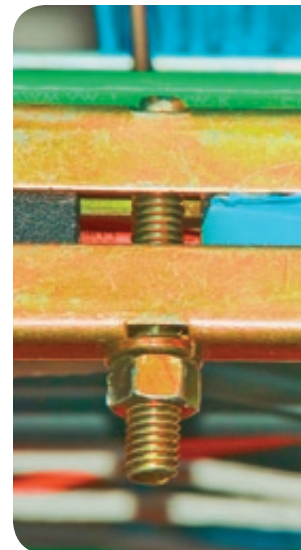
Explore a support model for non-general purpose classrooms on campus.

Because of the high level of support that CSS provides to UNT's general purpose classrooms (the "110" classrooms,) there have been frequent requests for similar service to rooms that currently fall outside of CSS's mission, the 210 and 220 classrooms. CSS has therefore undertaken an analysis of the costs and implications of providing its services for those classrooms, which likely will take the form of a startup cost for CSS to equip rooms with its standard setup and ongoing costs to maintain the equipment and refresh it on the same schedule as its 110 classrooms. That analysis and a pricing model are expected to be completed by the end of the Fall 2008 semester.

Develop and manage shared computer classrooms for academic instruction.

The CITC's Academic Computing and User Services division has taken on the management of four computer classroom facilities at the Discovery Park. These "110 classrooms are available to any department on campus needing to use computers as an active part of their classroom instruction and may be scheduled through the Registrar's office. ACUS provides technical services to keep the computers available and useful to classes and also coordinates software availability in close cooperation with the departments who need to use these facilities. As computer classrooms become more a part of mainstream instruction it is anticipated that a centrally-managed computer classroom service may expand to include the main Denton campus as well.