We are a service arm of Northwestern University dedicated to advancing its reputation, influence and competitiveness. Through the effective deployment of information technology, we support teaching, research and the administration of the University. We are committed to innovate and improve the quality of services in a fiscally responsible manner. We collaborate efforts with other institutions and business enterprises on opportunities of mutual benefit in support of our goals.

We commit to anticipate and respond to our clients’ needs. We partner with them to find and determine the appropriate solutions. In return, we ask our clients to develop the skills necessary to use and support information technology and commit their resources along with ours.

We respect our employees and value their contributions. We provide them with opportunities for professional growth, job satisfaction and leadership. In return, we ask employees to support the organization's goals, be team players with their colleagues throughout the University and be dedicated to satisfying the needs and expectations of our clients.

**Goals**
Advance Northwestern University through Technology by:
- Partnership with Academic and Administrative Units
- Technical and Service Excellence
- Reliable and Secure Systems
- Commitment to Staff Development
- Cost-Effective Use of Resources
- Strategic Corporate and Government Partnerships

**Principles**
- Teamwork and Mutual Respect
- Honesty and Integrity
- Dedication and Commitment

mission statement

goals & principles
# Northwestern University Information Technology
## Strategic Plan
### FY2003-FY2005

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Introduction

The mission of Northwestern University Information Technology (NUIT) is to provide the highest quality information technology services to the Northwestern University community. NUIT achieves this mission through collaborative planning, partnerships, teamwork, innovation, commitment to excellence, and effective use of resources. This document presents a strategic technology plan for Northwestern University reflecting the results of an extensive consultative process to identify the technology requirements and priorities of the University community. The specific initiatives described in this planning document respond to the needs articulated by schools, academic departments, and administrative units in their individual strategic planning documents, and further expressed in campus planning meetings. (Appendix 1)

The academic and administrative units’ strategies and goals for both present and future challenges emphasize their reliance on information technologies to support teaching, research, and business processes. This reliance is visible in the efforts of academic programs to redesign curriculum and create new models for teaching and learning. It is evident in the plans of academic leadership to establish measures of research productivity, to attract and retain the most capable faculty and students, and to implement performance-based decision-making processes. Additionally, this reliance on technology is integral to efforts throughout the University to identify and explore new opportunities for improving and expanding services and, at the same time, enhancing the efficiency and effectiveness of business processes.

The FY2003 - FY2005 initiatives presented in this strategic planning document reflect both NUIT’s fundamental mission and the tightly-coupled relationship between information technology services and the goals and directions of individual schools, departments, and administrative units that represent the University community. (Appendix 2) These initiatives form a focused response to challenges and opportunities in the following areas: teaching and learning, knowledge management, student services, campus services, and the security of Northwestern University’s information and technology resources. These initiatives are designed to support the vision of Northwestern University and advance its stature, influence, and competitiveness.
Teaching and Learning Initiatives

Northwestern University faculty provides the institutional leadership for exploring and integrating innovative approaches to teaching and learning. NUIT has been an active partner in these efforts by building and sustaining the necessary technology infrastructure to foster this innovation and integration, including hardware, software, networks, consulting services, and training. Rapid growth in faculty participation and an increasing demand from academic programs are indicators of the significant success of this partnership. The FY2003 - FY2005 teaching and learning initiatives continue these collaborative efforts to enhance the educational experiences of students at Northwestern University.

**Initiative: Expand the digital media distribution services delivered over the campus data network to include new videoconferencing capabilities and video-on-demand for Northwestern University content.**

NUIT offers the University community a wide range of digital media services including hands-on workshops to assist faculty with streaming audio and video, digital imaging, and interactive media applications for teaching and research. Faculty involvement in the development of media-intensive applications for teaching and research has created a demand for expanded modes of content delivery, specifically, video services over the campus data network to the desktop. This includes both new videoconferencing capabilities and video-on-demand services for Northwestern University content. These digital media services complement the four traditional video classrooms on the University's campuses that were funded by the State of Illinois.

**Initiative: Increase the number of Smart Classrooms. Upgrade classrooms and develop new, flexible classroom models with enhanced capabilities.**

Smart Classrooms create new opportunities in teaching and learning by integrating computer, multimedia, and network technologies. These classrooms are equipped with ceiling projectors, sound systems, computers, VCRs, DVD players, slide projectors, and/or overhead visualizers. As schools and departments have integrated new technology-dependent pedagogies into their curricula, the demand for Smart Classrooms has grown rapidly and now exceeds availability. Moreover, as they gain experience with new instructional technologies, faculty members are introducing innovative, learning-oriented, instructional approaches, creating a need for more flexible classroom models with additional technology requirements.
Initiative: Replace the current Course Management System with a more sophisticated and flexible system.

A highly visible instance of faculty members using new technology for instruction is the integration of Web-based activities using the University’s Course Management System. Used in nearly 700 courses each quarter, this system enables online management and delivery of course materials and supports interaction among faculty and students. It facilitates collaboration, new learning opportunities, and any-time access to course materials. Additionally, it interfaces with the Student Enterprise System to allow faculty to provide grades electronically and provide them with up to date registration information. The Course Management System can also enhance the efforts of academic programs wishing to create opportunities for faculty to participate in continuing education and distributed learning initiatives.

As academic programs have incorporated the Course Management System into their pedagogical designs and as faculty continue to explore the potential of Web-based instruction, the existing Course Management System may not be able to meet the long-term requirements. Continued advancement in integration of new instructional designs requires a more scalable and standards-based approach that supports interoperability with other collaboration and pedagogical applications.

Initiative: Replace the Course and Teacher Evaluation Council (CTEC) application with a reliable enterprise system.

The CTEC application has become a primary tool used by students in planning their educational experiences at Northwestern University. The CTEC application supports Web access to evaluations completed by students for each undergraduate class as well as informational course materials provided by faculty. The CTEC application was not designed to support current usage levels, and its design does not ensure the reliability and scalability consistent with its role as an enterprise system. Because students rely on CTEC, its information has become an integral part of the student experience; this application will be replaced with a more reliable enterprise system.

Additional details on the Teaching and Learning Initiatives appear in Appendix 3.
Knowledge Management Initiatives

The FY2003 - FY2005 Knowledge Management initiatives focus on establishing the technology infrastructure, including hardware, software, and support services, required to integrate a substantially enhanced level of Web-based services throughout the University. Currently, efforts of academic and administrative areas are severely constrained by the lack of enterprise-wide information management and analysis tools. Knowledge management tools and services will create opportunities for schools and departments and administrative units to improve communications processes, redesign service delivery processes, and establish tightly coupled data analysis and decision-making processes. Additionally, these tools and services will enable schools and departments to respond more quickly to new opportunities and challenges.

Initiative: Provide Knowledge Management tools and services including technologies for document and Web content management, information retrieval and search, business process automation, and project collaboration.

Academic and administrative offices on both campuses are participating in the overall University effort to achieve “the highest order of excellence.” Offices are striving to improve the delivery of current information to the Northwestern community, reduce administrative complexities, implement more customer-sensitive and customer-focused processes, enhance internal and external relationships, and improve the quality of decision-making. With the appropriate knowledge management tools and services, the NUIT staff, together with staff across the University, will be able to collaborate to develop the Web-based applications required to realize these goals. The University’s constituencies for whom Web-based applications will enhance services include current students, parents, faculty, staff, retirees, prospective students and faculty, alumni, donors and research, and business and community partners.

Initiative: Provide central Web development and application hosting services.

By establishing centralized Web development services, the University will be able to realize a higher level of effectiveness and efficiency than would be possible with widely distributed development efforts. Additionally, NUIT staff will be able to facilitate collaboration among offices with similar application requirements and design shared training and workshops. Finally, the services that academic and administrative units have identified for Web deployment require an enterprise-system level of support. Many of these applications will interface with existing enterprise systems. Through centralized hosting services, NUIT staff will ensure consistent integration of management and security policies and practices.
Initiative: Implement a production system for electronic submission and processing of theses and dissertations.

Dissertations in electronic form offer many advantages over the traditional paper form. These include accessibility, potential for wider dissemination of the work, and inclusion of a variety of presentation media. Recently, the Electronic Dissertation Task Force, sponsored by the Graduate School, completed a pilot project to test the submission and processing of doctoral student dissertations in electronic form. The task force is now developing a recommendation for the implementation of a full production electronic dissertation system. NUIT has participated in the Task Force and will be responsible for implementation.

Additional details on the Knowledge Management Initiatives appear in Appendix 4.
Student Services Initiatives

Northwestern University is committed to providing the highest quality of services to students. This commitment is reflected in the recent enhancements of systems supporting student services. The Student Enterprise System offers students an array of online services including registering for classes, changing their addresses, viewing their accounts, and accessing their unofficial transcripts. Additional upgrades are needed to address areas where services to students remain dependent on outdated technology. These outdated systems cannot support the functionality expected by today’s students. They are not designed to interface with the Student Enterprise System and are not cost-effective to maintain. The FY2003 - FY2005 Student Services Initiatives continue the University’s efforts to expand and enhance services to students through targeted, innovative, and cost-effective deployment of technology.

Initiative: Replace current archaic housing applications with a system supporting equitable policies and automated room assignments.

A new Web-based housing system will be introduced in early 2003. The system will interface with the Student Enterprise Information system and will track housing assignments and room availability on a real-time basis. Using this new system, students will be able to enter their room preferences and retrieve their room assignments online.

Initiative: Replace outdated Student Loan System.

The current Student Loan System is a highly complex, customized version of an outdated and unsupported vendor provided system. This system needs to be replaced with a new, supported system that provides the required functionality and interfaces to the Student Enterprise System. NUIT will support the Office of the Controller to find an appropriate replacement.

Initiative: Support delivery of entertainment television to the residence halls over the campus network.

For many years, students in the residence halls have requested cost-effective delivery of TV with on-air and extended channels to the residence halls. This past April, a pilot program was conducted to deliver entertainment television, called NUTV, to four residence halls over the campus network. Full deployment was completed this summer (FY2003), and students in all residence halls are able to watch TV on their computers. Several channels have been reserved for use by the University to provide future transmission of performing arts, campus news, and other campus events.

Additional details on the Student Services Initiatives appear in Appendix 5.
Campus Services Initiatives

A campus-wide effort is underway to enhance the quality of services and extend the range of services offered to internal and external members of the Northwestern community. A key focus of this effort is redesigning the processes supporting the delivery of these services. This relies heavily on the availability of the appropriate technology infrastructure and resources. Each of the FY2003 - FY2005 Campus Services initiatives represents an enhancement to the University’s technology infrastructure and a contribution to the overall effort to improve or extend services.

Initiative: Replace the mainframe-based University Financial System, with a system based on current client-server, relational database technology and Web functionality.

The University's financial system, College and University Financial System (CUFS), is a mission-critical system and plays a pivotal role in the provisioning of a variety of services to students, faculty, and staff. Installed in 1983, this system is no longer supported by the vendor and cannot provide the functionality expected of a modern system. This limits the quality of service that can be delivered and restricts opportunities for electronic commerce. NUIT will support the Office of the Controller to explore and recommend a replacement strategy.

Initiative: Evaluate and Implement Events Management System.

The Events Management System provides extensive functionality for planning and managing events and is part of a suite of current software applications supporting the activities of the Office of Development. This initiative will include surveying University schools and departments to determine their interest. The University Office of Special Events, Alumni Relations, and The Office of Development's Special Events office have already expressed a need.

Initiative: Integrate a University-wide calendaring system to support scheduling and calendaring applications for faculty, students, and staff.

Central administration and some departments currently use a centrally managed calendaring system; however, this functionality is not implemented campus-wide. An integrated University-wide calendaring system will facilitate efforts of academic and administrative units to establish collaborative initiatives reducing the amount of time faculty, staff, and students spend scheduling meetings.
Initiative: Provide central digital asset management and applications.

A substantial portion of the University’s information resources is stored on file servers located in individual departments or on the desktops of individual faculty and staff. Under these circumstances, it is not possible to ensure adherence to consistent, reliable, and secure data management policies and practices. Provisioning central digital asset management and applications will enable the integration of institutional data management policies and practices and create the opportunity for the University to realize the efficiencies associated with consolidation of data management responsibilities.

Initiative: Discontinue Campus Cable TV System and move its function to broadcast digital video distribution over the campus IP network.

The current cable television system, which serves a few campus locations, was installed in 1983. The system has been used primarily for viewing campus events, such as graduation, in remote locations. This system will be replaced with broadcast digital video distribution over the campus network. These Web-based broadcasts will be accessible from both on-campus and off-campus locations.

Initiative: Establish pilot projects to explore options for supporting mobile equipment access to campus resources and recommend appropriate equipment.

There is a growing need for mobile access to the University’s services and information resources. This initiative is designed to explore the options and opportunities for providing this access in a secure and reliable manner, test mobile equipment, and develop recommendations based upon the results of the pilot projects.

Initiative: Upgrade the Chicago Network Operation Center.

The Network Operation Center on the Chicago campus dates from the early 1980’s. This center houses voice, data, and video network facilities serving the University. Although maintained over the years, significant limitations of this facility now threaten NUIT’s ability to provide reliable services to the University community. During FY2003, this facility will be upgraded to make needed improvements to the power plant, environmental systems, fire suppression equipment, and security systems. This upgrade will also enable NUIT to meet current growth needs, and it will position Northwestern to take advantage of opportunities for future services, including the convergence of voice and data services over a single network infrastructure (referred to as Voice over IP).
Initiative: Upgrade the Evanston Network Operation Center.

As with the Chicago facility, the Network Operation Center in Evanston dates from the early 1980’s and needs significant upgrading to be able to continue to provide reliable voice, data, and video network services to the University and provide for growth. NUIT plans to upgrade the Evanston facility during FY2004.

Initiative: Migrate to Voice over IP.

Today, a convergence of voice, video and data services provided over a single network infrastructure is occurring. Voice over IP provides voice and data over one network. This technology has been under evaluation and testing by NUIT for the past three years. Migration of services by telecommunications and networking vendors is still evolving. Detailed analyses and planning for the potential migration to Voice over IP will begin FY2003.

Additional details on the Campus Services Initiatives appear in Appendix 6.
Network Security Initiatives

Northwestern University requires a comprehensive approach to securing its information and technology resources including strategies and mechanisms for preventing, detecting, and responding to security threats and attacks. Securing mission-critical University information and technology resources is required to protect the integrity and ensure the accessibility of these resources. The FY2003 - FY2005 Network Security Initiatives address those aspects of security that need to be either added or augmented to provide a higher level of security consistent with the mission-critical nature of these resources. Specifically, these initiatives address network intrusion detection, network perimeter security, physical security, protection of servers and applications, disaster recovery, user authentication, and practices associated with user responsibilities.

**Initiative: Implement an Intrusion Detection system.**

Intrusion detection is a key component of a comprehensive approach to network security. The number of attacks on the University network has been growing steadily, and responding to these attacks has become an increasingly complex task. An Intrusion Detection system will provide real-time feedback on the status of the University's network and will allow efficient detection in the early stages of an attack, thereby reducing the probability that a University resource will be compromised.

**Initiative: Implement a firewall (security software) to secure central servers.**

Perimeter security is another critical component to network security and firewall protection is a central element to securing the perimeter of a network. Without an effectively configured firewall, servers connected to the network are vulnerable to denial of service attacks that can disrupt services and compromise the University's information resources. This initiative addresses the need for a firewall configuration, which includes policy management, auditing, vulnerability assessment, and host intrusion detection.

**Initiative: Replace the present custom authentication system with an industry standard authentication system.**

Network authentication to control access to network resources by individual users is an essential part of an overall security strategy. The University's current authentication system was developed in house when commercial solutions and standards were not available. The adoption of a system consistent with industry standards is required to minimize the cost of deploying new software services and to eliminate both the development costs associated with maintaining a custom system and the risks associated with maintaining a one-of-a-kind system.
Initiative: Relocate servers supporting University enterprise systems and other critical systems to a secure, centrally managed facility.

Securing the University's information and technology resources includes security of the servers supporting critical University systems. To ensure consistent application of security policies and practices associated with preventing unauthorized access, all servers interfacing with University enterprise systems and other critical University systems will be located and maintained in a secure, centrally managed facility.

Initiative: Provide server redundancy for Central University Systems.

A critical aspect of securing the University's information technology resources is disaster recovery. Steps have been and continue to be taken to improve the University's disaster recovery capabilities. Two years ago, a disaster recovery site was designated and configured to support up to 15 servers. Last year, servers were located in this disaster recovery site. These servers are configured to support selected critical University applications such as payroll and registration. Additional disaster recovery sites must be identified and configured to provide redundancy as electronic information and accessibility to it increases.

Initiative: Assess the physical security of both the Evanston and Chicago Network Operating Centers and develop recommendations for security provisions reflecting the mission-critical nature of these locations.

Physical security in the Network Operating Centers at both the Evanston and Chicago campuses has not been substantially updated since 1984. This initiative addresses the need to update physical security at these locations.

The following initiatives have been implemented or are in implementation planning.

Initiative: Provide redundant fiber path from the Network Center to the central server location.

Redundancy in the University's network infrastructure enhances its overall reliability and reduces the impact of a single point of failure. To reduce the probability of interruption to University services resulting from a network outage, the University's Emergency Planning Committee has recommended that a redundant fiber path be installed between the Network Operating Center and the central server location that houses the University's enterprise servers.
Initiative: Expand the critical 2-way radio communication system to support communication capacity required during major campus events as well as emergency situations.

The 2-way radio communication system is the primary communication vehicle for Northwestern University Police and is also used extensively by Student Affairs, Facilities Management, Athletics, Risk Management, and Information Technology. The expansion of the radio system will provide increased functionality such as provision of campus-to-campus communication and, importantly, increases communication paths, which in the current configuration are “busy” during heavy usage. Funding for this initiative was the result of the efforts of the University Emergency Planning Committee.

Initiative: Deploy the Network Registration System (NetReg) to each residence hall computer.

NUIT is planning to deploy a program of registering all residence hall computers. By requiring registration of these computers in residence halls that are connected to the University’s network, NUIT is able to regulate file sharing and respond quickly to incidences of inappropriate network activity.

Initiative: Provide the Norton Anti-Virus software to faculty, students, and staff.

Each system connected to the University’s network is a potential attack target and a single compromised system poses a security threat. As part of NUIT’s overall security effort, in April 2002, Norton Anti-Virus software was selected and made available to staff, faculty, and students.

Summary

The FY2003 - FY2005 initiatives outlined in this strategic planning document continue the service-oriented evolution of Northwestern University’s technology infrastructure and services. These initiatives are designed to add to and leverage existing technology and to establish new technology infrastructures and services. Northwestern University Information Technology will continue to work closely with the University’s schools, departments, and administrative units to tailor implementation of these initiatives to address campus priorities. NUIT leadership will continue its collaborative sessions with Deans, Department Heads, and campus Information Technology Directors to explore future technology directions and ensure alignment between NUIT initiatives and campus technology requirements. NUIT is committed to achieving its mission through collaborative planning, partnerships, teamwork, innovation, commitment to excellence, and effective use of resources. Ongoing collaborative planning efforts will ensure that the University’s technology strategies and initiatives remain focused on supporting teaching, learning, research, and business processes in expansive and enhanced ways, and as a result, contribute to advancing the stature, influence, and competitiveness of Northwestern University.
Appendix 1 - Strategic Planning Approach - Fiscal Year 2003

- Review Strategic Plans of schools and department for technology elements
  Participants: Vice President and Chief Technology Officer, Associate Vice President and Deputy Chief Information Officer and Information Technology Directors

- Confirm Information Technology division understanding of school and department Strategic Plan technology elements with deans and department heads
  Participants: Vice President and Chief Technology Officer, Associate Vice President and Deputy Chief Information Officer

- Determine White Paper topics for future technology deployment
  Participants: Vice President and Chief Technology Officer, Associate Vice President and Deputy Chief Information Officer and Information Technology Directors

- Brainstorming sessions to ascertain school and department technology needs and issues over the past year:
  - Discuss, document and prioritize their technology needs
  - Review their issues with technology
  - Develop list of current Northwestern University Information Technology activities in schools/departments
  Participants: Information Technology Directors with their staff

- Review and document results of Northwestern University Information Technology Director/Staff Meetings to be included in Strategic Planning discussions at annual retreat and review and discuss white papers
  Participants: Associate Vice President and Deputy Chief Information Officer and Information Technology Directors

- Determine and document for review at annual retreat:
  - Internal Northwestern University Information Technology activities to improve operations and service
  - Services for possible elimination
  - Revenue opportunities
  - Initiatives that can be handled within IT operations budget
  Participants: Associate Vice President and Deputy Chief Information Officer, and Information Technology Directors

- Review results of above Northwestern University Information Technology pre-strategic plan activities for consistency with University Goals
  Participants: Associate Vice President and Deputy Chief Information Officer
• Review results of above Northwestern University Information Technology pre-strategic plan activities with school and department “Chief Information Officers” and request their input
  
  Participants: Associate Vice President and Deputy Chief Information Officer

• Annual Information Technology Retreat: review data gathered, engage in traditional strategic planning methods and update 3-year plan
  
  Participants: Vice President and Chief Technology Officer, Associate Vice President and Deputy Chief Information Officer and Information Technology Directors

• Meet with Deans – Speech, Music, Journalism, Education & Social Policy, and Library to review Information Technology strategic plans and refine as necessary
  
  Participants: Vice President and Chief Technology Officer, Associate Vice President and Deputy Chief Information Officer and Information Technology Directors

• Meet with Information Technology Advisory Committee-Review Strategic Plan and garner consensus
  
  Participants: Associate Vice President and Deputy Chief Information Officer

• Review Strategic Plan with University Budget Committee Participants

• Refine plan to emerge into University Information Technology Three Year Strategic Plan
  
  Participants: Vice President and Chief Technology Officer, Associate Vice President and Deputy Chief Information Officer

• Share Plan in various forums – University groups, Trustees, and Partners Participants

• Review objectives quarterly to determine progress, new directions, and changes
  
  Participants: Associate Vice President and Deputy Chief Information Officer and Information Technology Directors
Appendix 2 - NUIT Constituent Groups

*University Committee on Information Technology*
This faculty committee with ex officio representation from the University Library, Office of the Provost and Information Technology advises the Vice President and Chief Technology Officer on the deployment of information technology to support the academic programs of the University.

*Information Technology Coordinating Council*
The members of this council include representatives from the Schools, Library, and the administrative offices of the University and advise the Vice President and Chief Technology Officer on information technology issues and encourages collaboration between the schools and administration of the University in the effective use and deployment of Information Technology resources and services.

*Information Technology Rates and Services Advisory Committee*
The members of this committee, school faculty and deans, representatives from University administration and outside experts, review NUIT telecommunications service plans, re-charge rates, pricing methodology and marketplace rates and advise the Vice President and Chief Technology Officer.

*Chief Information Officer Roundtable*
The members of this group are the technology leaders in the schools. They meet to discuss information technology operational issues and exchange information to improve the use and delivery of information technology throughout the University.

*Associated Student Government/Information Technology*
This group, created by the Associated Student Government, includes Information Technology management and students and is used to solicit student input on issues that relate to technology.

*SES Core Coordinating Team (SCCT)*
The directors of the functional areas, which are primary users of the Student Enterprise System (SES), and Information Technology staff, agree upon goals, prioritize projects, coordinate processes and jointly solve problems to insure that the Student Enterprise System is used effectively as an integrated system.
Electronic Time Entry Committee (ETEC)
This committee is comprised of staff that has responsibility for Human Resource functions in their schools or departments. The committee offers input, advises and assists with issues related to implementation of Electronic Time Entry System.

ADVANCE Steering Committee (ASC)
This group serves in an advisory capacity to the Director of Finance and Technology for University Development and is comprised of representatives from areas that use the Development system and Information Technology staff. The committee reviews, coordinates, and prioritizes the projects and resources to support the ongoing deployment of the ADVANCE Development System throughout the University.

Electronic Thesis and Dissertation Task Force
This group is comprised of staff from the Graduate School, The University Library and Northwestern University Information Technology. The task force was formed to design and implement a pilot for submission and processing of doctoral student dissertations in electronic form. After completion of the pilot, the group is now charged with developing specifications and a recommendation for implementation of a full production Electronic Thesis and Dissertation System.

Student Financial Services Task Force
This group is comprised of staff from Student Accounts, the Controller’s Office, Student Loans, Associate Provost for Enrollment, Financial Aid offices, and Information Technology. This task force is working with the Office of Change Management to improve the delivery of student financial services through more efficient processes and Web-based self-service systems initiatives.

Residence Hall System Implementation Team
Comprised of staff from University Housing and Northwestern University Information Technology, the team is working together to implement a Web-based Housing Management System.

University Network of Information Technology Specialists (UNITS)
This group is a community of support staff, working in divisions and departments, which share technical assistance information across the University. Northwestern University Information Technology organizes this group and provides advice, training opportunities, and technical assistance for them.
**University Relations Committee (URC)**

This committee includes Northwestern University Information Technology staff and individuals from departments and schools who represent the University’s interest in providing timely and easily accessible information on the Web. The steering committee also is charged with the development and application of policies and standards for the Northwestern University Web site, such as privacy, intellectual property, information security, editorial and style guidelines, and commercial activity on the Northwestern Web site.

**Provost's Office Classroom Committee**

This committee is co-chaired by the VP of Facilities Management and by the Associate Provost for Budgets, Facilities and Analysis. The committee includes NU faculty, staff from Northwestern University Information Technology and the Searle Center for Teaching Excellence, and managers from the Registrar Office and Facilities Management. This group steers Northwestern University investments in campus classrooms and learning spaces. The Provost Office Classroom Committee pays attention to all forms of classroom improvements, but much of the attention of the committee has been on the development and evolution of Smart Classrooms.

**Kresge Digital Media Studio Faculty Advisory Committee**

This advisory committee consists of faculty from Medill, Music, and Communications. The committee works with Northwestern University Information Technology to guide the development of class-support services and common standards for this primary teaching lab. The committee also serves as mediator for competing NU course use demands of this teaching space.

**2East Liaison Group**

This group includes representatives from the NU Library and NUIT Academic Technologies that have offices in 2East, the floor of the University Library building that is dedicated to faculty support services. The 2East Liaison Group plans faculty development workshops, seminars and brown bags. The group also publishes a joint email to NU faculty about teaching and technology issues.

**Northwestern University Computer Emergency Response Team (NU-CERT)**

NU-CERT is lead by NUIT and its members are from the Schools and administrative divisions of the University. NU-CERT provides a defined point of contact for communication about computer and security issues with national and international security organizations and law enforcement agencies. NU-CERT’s members collect and disseminate information on issues related to computer security, including information configuration, management and bug fixes for computing systems. This sharing of information among the members ensures continued focus on security at Northwestern.
Appendix 3 - Teaching and Learning Initiatives

**Digital Media Distribution Services**

Digital media distribution services have become a key function at major universities and are crucial to teaching and research missions. Digital media distribution is now a University-wide requirement, and it is a key resource for multiple disciplines. Funding is needed to provide the infrastructure and services to support the continued evolution of digital video services over the campus data network, including support of new videoconferencing capabilities and provision of video-on-demand services for Northwestern University content (e.g., recording live Webcasts for later use).

**Smart Classrooms**

Planning for Smart Classrooms is coordinated with the Provost’s Office Classroom Committee. Recurring funding has been put in place recently to bring all 28 current NU Smart Classrooms up to current technology standards, as well as to provide funding for their continued maintenance and periodic upgrade. Additional funding will be required to expand the number of Smart Classrooms, to develop new classroom models, and to introduce new capabilities with wireless and video. By developing lower-cost laptop-based classroom models, we hope to be able to increase the number of Smart Classrooms that can be put into play on campus with the addition of modest new additional monies.

**Course Management System**

Over the last three years, the University’s Course Management System has established itself as an information technology innovator to Northwestern University teaching activities. It is being used today by almost 700 courses each quarter, and faculty adoption continues to grow. This proposal assures that we will continue to have a flexible and reliable course management system in place for our faculty/student needs by Fiscal Year 2005. This objective is mission-critical to Northwestern University teaching efforts, and will require an upgrade of the current system or its replacement.

**CTEC (Course and Teacher Evaluation Council) Replacement**

The CTEC suite of applications has become one of the primary tools students use in planning their educational experience at Northwestern. CTEC includes the gathering and publishing of student course evaluations and the publishing of faculty provided in-depth material about offered courses, all available on the Web. It also supports academic and administrative analysis of course evaluation information. CTEC, a system designed in house, is not an enterprise-class system, even though it is depended upon as though it were one. It is not uncommon for the system to crash under the ever-increasing usage load. Redevelopment of CTEC on an enterprise platform will ensure the reliability, scalability, and extensibility of this system.
Appendix 4 - Knowledge Management Initiatives

Knowledge Management Tools and Services
As the University’s intellectual and administrative assets become almost entirely electronic, little has been done to systematically organize, manage, and secure these electronic assets to assure they can be used effectively as University personnel, programs, and priorities change over time. To address this need, Knowledge Management brings together a number of technologies that leverage the University’s networked environment and investments in desktop systems. These technologies include document and Web content management; information retrieval and search; business process automation; and project collaboration. Knowledge Management tools and services provide the enabling technology for innovative University initiatives, including Web Publishing Content Management; Electronic Thesis and Dissertation; Document Management and Workflow; and Digital Media Content Management.

Web Development Application Development Application and Hosting Services
Many departments are very interested in a central service that provides Web authoring and hosting applications. These departments do not have the necessary expertise nor can they support reliable hosting. Some schools that have the financial resources have purchased this expertise or used outside firms to provide the service. As a result, University assets and services are being held and delivered from outside firms with unknown commitments to security and availability. Without on-campus alternatives long-term, the applications will be written by firms and individuals without awareness or concern for University standards or support in the future. The funding outlined represents the cost of computer platforms for hosting and staff expertise to develop the Web-database applications.

Electronic Thesis and Dissertation System
An Electronic Thesis and Dissertation Task Force sponsored by the Graduate School has completed a pilot project to test the submission of doctoral student dissertations in electronic form. The task force is now focused on developing a recommendation for the implementation of a full knowledge management production system for the electronic submission and processing of dissertations. Electronic dissertations offer many advantages over paper dissertations, including wider dissemination of the work, search ability internally, archiving, and the inclusion of variety in presentation media.
Appendix 5 - Student Services Initiatives

Housing System Replacement
Student Affairs is committed to replacing the current lottery system for room assignments with a more scientific and equitable method. The University has been using three separate housing systems with archaic mainframe technology. A new housing system will automate room assignments and eliminate the challenges inherent in maintaining and enhancing the legacy mainframe housing systems.

Student Loan System Replacement
The Student Loan System (ACLS) handles the banking processes that allow the University to function as a lender. It was created using IBM software that has been unsupported for several years. It has needed extensive modifications to interface with the SES (Student Enterprise System). With each modification or operating system upgrade, the probability of application failures increases. ACLS is a highly complex, customized version of an outdated vendor system, which is not documented or supported by the vendor. The current system must be replaced by either a University designed system or a vendor system.

Entertainment TV in Residence Halls
With the approval of the Board of Trustees, the Office of Student Affairs has directed Information Technology to provide entertainment TV (NUTV) to the residence halls. NUTV will be delivered over the University’s campus network using state-of-the-art technology. This initiative responds to ongoing requests from the student body. With this new technology, services can be provided more cost effectively than with traditional cable deployment.
Appendix 6 - Campus Services Initiatives

Financial System Replacement
The University’s oldest mission-critical system, CUFS (College and University Financial System) was implemented on the mainframe in 1983 and is no longer supported by the vendor. Today’s technology and the technology on the horizon have radically changed expectations. A new relational database/client server financial system with secured Web access is needed to provide better access for end users while retaining and improving functionality required by the University.

Events Management System Evaluation
The Office of Development is the principal user of the recently installed Alumni System, which provides alumni records and development support functionality. A complete, stand-alone Events Management System is part of the purchased software suite. It provides extensive functionality for planning and managing events. The University Office of Special Events, Norris Center, the Chaplain’s Office, and schools and departments are among those who sponsor events or manage venues and are potential users of a campus-wide events management system. This initiative will include surveying University schools and departments to determine their interest and implementing the system. The University Office of Special Events, the Alumni Office and the Development Office of Special Events have already expressed their need for the system.

University-wide Calendaring for Faculty, Students and Staff
A University-wide calendaring tool will provide faculty, students and staff with the ability to create personal calendars and easily schedule meetings with other members of the University community. While many departments use the current calendaring tool, not all do, and generally staff - not faculty or students - use the service. Scheduling meetings with others still often involves a flurry of email or phone messages to find convenient times for all participants. This initiative will make calendaring as ubiquitous a service as email.

Central Digital Asset Management and Applications
The need for central digital asset management and applications is becoming increasingly important to the University. Network storage facilities allow the storage and retrieval of information from anywhere, anytime. Network storage allows electronic information to be systematically backed up and files accurately maintained, archived, and retrieved in a structured, reliable environment.
Replacement of Campus Cable TV System
The current cable television system was installed in 1983 and serves a few locations across our campus. The system has been used primarily for viewing campus events in remote seating locations. This system will be replaced with broadcast digital video distribution over the campus network in much the same way as the proposed student entertainment TV.

Mobile Equipment Access to Campus Resources
As the University community becomes more mobile, using laptop computers, and PDAs (Personal Digital Assistants) to access information via wireless connection will increase in importance. This funding establishes pilots and provides recommendations, which address the equipment mobility needs of the community.

Upgrade of Chicago Telecommunications Facility and Upgrade of Evanston Telecommunications Facility
In the early 1980’s space on the Evanston campus and Chicago campuses was built to accommodate telecommunications equipment and staff. These facilities have served the University well over the past twenty years, and while they have been maintained, they have not been significantly upgraded to provide growth needs and serve the variety of new technology services. NUIT is at the limit of power requirements, environmental systems and fire suppression equipment. In addition, the facilities do not meet the current stringent security requirements. The drivers of these upgrades are the strategic importance to the University of the current systems, networks, and equipment housed in these locations; known and planned technology requirements; current and anticipated growth services; the need for expanded disaster recovery alternatives; improved security; and the ability to continue to deliver reliable services.

Voice over IP
The provision of voice over the data network is the next known and accepted major technology change. Over the past three years, NUIT has been investigating and analyzing the marketplace providing this new technology. It is anticipated that during the next three years a business plan will be developed and deployment will begin of Voice over IP at the University.
Appendix 7 - Network Security Initiatives

Network Security - Intrusion Detection
Computer break-ins from off campus via the network continue to rise, and the management of these break-ins and their prevention has become an increasingly complex task. The risks regarding computer break-ins range in severity from the loss or theft of desktop files and data, to loss of research data, to loss of mission-critical business information of the University. An Intrusion Detection system will allow efficient detection of incoming hostile traffic on the network.

Firewall for Central Server Security
A firewall configuration prevents attacks on our servers causing denial of service that can take hours to fix. The attacks on our servers have increased substantially over the last year. A firewall configuration along with security software, which includes policy management, auditing, vulnerability assessment, and host intrusion detection, is included in this initiative.

Standard Authentication Environment
Authentication systems allow access to electronic resources through user name and password validation. SNAP (Simple Network Authentication Protocol) was developed at Northwestern University and has been in service for seven years. SNAP must now be migrated to industry standards to minimize the cost of deploying new software services and to reduce the cost of maintaining this custom system.

Relocation of Servers to the Central Server Location
Servers in departments that interface with University enterprise systems and other critical University systems must be protected from being compromised and maintained in an effective uniform method. Relocation of these servers from departments and schools to our secure centrally managed facility will minimize these risks.

Network Redundancy to Central Server Location
A proposal to provide a redundant fiber path from our Network Operations Center to our central server location has been submitted to the University's Emergency Planning Committee. This is the top funding priority of the Committee.
Server Redundancy for Central University Systems

The additional redundancy site at the Chicago campus will have 860 square feet of data center space. The space will handle 21 racks for server hardware, an Enterprise Storage Unit and Tape Library. The critical University applications will be designed to run from both the Chicago location and the current Evanston data center. We expect to have the site completed in 2004 in conjunction with the Chicago Network Operation Center.

Physical Security of Network Operation Centers

The central server support location is protected by a card key access system and recent renovations have secured windows. The physical security in the Network Operation Centers in Evanston and Chicago was installed in 1983. The security issues in these areas are being addressed as part of the growth and infrastructure evaluations now in progress. The resulting recommendations should ensure that access is secure and appropriate for the increased critical systems in these locations. In addition, all central network and server addresses and building names have been removed from our Web sites.

The following initiatives have been implemented or are in implementation planning.

Expansion of 2-Way Radio System

In response to communication overload conditions during the August, 2001 flood and during major campus events, the University Emergency Planning Committee successfully spearheaded a request for funding to expand the 2-way radio communication system. This will significantly improve communication capacity and allow easy communication between central functions on both campuses. This system is the primary communication facility for Northwestern University Police and is also used extensively by Student Affairs, Facilities Management, Athletics, Risk Management, and Information Technology.

Network Registration System

The deployment of a Network Registration (NetReg) system is planned for each residence hall computer. This system is designed to provide information on network usage and allow Information Technology personnel to regulate file sharing and react quickly to computer viruses.

New Anti-Virus Software

In April 2002, Norton Anti-Virus software was made available to staff, faculty, and students. This new software was selected because it was far more robust and less expensive than the previous software. It can be accessed on the network or with a CD. The CD is available at no charge on both campuses.
Appendix 8 - Partnerships, Gifts & Grants

Northwestern University Information Technology (NUIT) continually seeks partnerships, gifts, and grants to create and fund opportunities to evaluate emerging technologies, support faculty research, and advance the University’s mission and stature. NUIT participates in partnerships with members of the Northwestern University community, other higher education institutions, private companies, and governmental bodies. In fiscal year 2002, gifts and grants in support of NUIT efforts were valued at more than $3.4 million.

During fiscal year 2003 through fiscal year 2005, we will continue to pursue this level of collaboration. Proposals written by faculty in Law, Feinberg Medicine and Engineering have been submitted to major funding agencies and include an information technology component. This effort will be expanded over the next three years. Current efforts are summarized below.

The Collaboratory Project

The Collaboratory Project is a Northwestern University initiative that provides project consulting, training, technical advice, and Web-based resources and services to K-12 teachers and their students who are interested in using Internet technologies to advance education. Funded by a grant from the Illinois State Board of Education and SBC-Ameritech, it provides these services to educational, cultural, and nonprofit organizations. The Collaboratory also has received a grant from the State of Illinois to fund a foreign language initiative and a grant from the National Educational Computing Association to support an initiative in the fields of music, art, and writing. We are seeking funding from the National Science Foundation and the Department of Defense Authority to continue and expand The Collaboratory.

STAR TAP and StarLight

StarLight, the next generation to STAR TAP (Science Technology and Research Transit Access Point), is a co-location facility located at Northwestern University for global advanced research networks. It was designed and developed in partnership with the University of Illinois at Chicago and Argonne National Laboratory, and is funded by the National Science Foundation. StarLight is being designed to support large-scale global eScience based on Grid computing and advanced applications related to next-generation optical networking. StarLight will lead federal, state and international research networking.
EuroLink
Related to StarLight is EuroLink, another cooperative project with several organizations, including Argonne National Laboratory, the University of Illinois at Chicago, and CERN, the European Organization for Nuclear Research (High Energy Physics), and SURFnet (Netherlands National Research and Education Network). This facility, soon to be located at Northwestern University, provides links to Europe as well as capabilities for network middleware architecture and component development.

TransPAC and Asia-Pacific Networks
TransPAC is a program that allows United States advanced networks to interconnect with Asia-Pacific networks, including those that are coordinated through the Asia Pacific Advanced Networking organization (APAN), in addition to TransPAC, we are engaged in projects with other Asia-Pacific advanced education and research network organizations, institutions of higher education, and research centers, including SingAREN (Singapore Research and Education Network) and TANet (Taiwan).

I-WIRE
NUIT is a partner in the I-WIRE project (Illinois Wired/Wireless Infrastructure for Education and Research). Funded by the State of Illinois, this infrastructure is being developed to provide access to TeraGrid, a next-generation, national high-performance distributed infrastructure. The Grid computing concept envisions multiple highly distributed global resources being integrated into and used as a single fabric. NUIIT is involved in multiple Grid projects that are designing services to support this infrastructure and address data communication optimization requirements that are not offered by traditional service providers.

Advanced Optical Networking and OMNInet
The Optical Metro Network Initiative (OMNI) is creating a model for next-generation, optical networking. It was established by NUIIT in partnership with SBC-Ameritech, Nortel, University of Illinois at Chicago, Argonne National Laboratory, and the Canadian National Research Network. The research partners have created an advanced metro network test bed (OMNInet) based on leading-edge photonic technology. These services will enable a wide range of advanced applications, including those related to digital video, streaming media, remote access to scientific instruments, virtual-reality, data mining, computational scientific research, engineering, health care, and finance.
**Metropolitan Research and Education Network**

NUIT’s iCAIR unit manages the Metropolitan Research and Education Network (MREN), which is a regional partnership that provides advanced, high-performance network connectivity for higher education organizations and research labs in seven states in the Midwest. MREN also provides connectivity to various national research and education networks, and to international research and education networks through StarLight.

**Visualization Laboratory**

With equipment donations from Sun Microsystems, we are providing a state-of-the-art visualization laboratory for faculty use and to demonstrate low cost capabilities that might be appropriate for departments with significant visualization needs. A few years ago the graphical demands of high-end visualization required expensive systems beyond the reach of an individual department or researcher. Today, advanced visualization can be carried out using PC graphics boards at a modest cost. The facility is intended to be a scalable system that allows researchers to carry out desktop visualization in their department and then transfer their data and the state of their visualization to the laboratory for more intensive analysis.

**International Virtual Institute for Materials Science Institute and Materials World Modules**

iCAIR supports the Materials Sciences Research Center, which is creating an International Virtual Institute for Materials Science and a series of learning modules funded by the National Science Foundation. This includes investigating new potentials for international Nanotechnology research collaborations and developing new techniques for distributed learning over next-generation networks.

**Electronic Encyclopedia of Chicago History Project**

The Chicago Historical Society and the Newberry Library have been developing The Encyclopedia of Chicago History, to be published by the University of Chicago Press in the fall of 2004. NUIT is working with these two research institutions to develop an electronic version of the encyclopedia that will follow shortly after the print encyclopedia’s release. NUIT developed a prototype Web site for the project several years ago that was used by the Chicago Historical Society to obtain initial funding. During fiscal year 2003, we expect the Chicago Historical Society to contract for additional Web development services. This project will provide new opportunities for Northwestern students to work on public history projects, and it will provide digital materials with which new American Studies courses at Northwestern can test their pedagogical ideas.
Hubble Space Telescope Project
Funded by the National Science Foundation, the Hubble Space Telescope Project provides an interactive college-level Web lab that allows astronomers to use the Hubble Space Telescope to determine distances to galaxies and the age of the universe. NUIT will continue to provide technical staff support for this project, which is part of the Astronomy Web Lab Series of the Weinberg College of Arts and Sciences.

Dunhuang Caves Project
Funded by the Andrew F. Mellon Foundation, this initiative is creating a virtual archive of the wall paintings, texts, and other objects from these Chinese caves, most of which are now in museums all over the world. It is a prime example of digital technology deeply transforming the documentary basis for study of a particular time and place in history. NUIT provides technical staff support to Northwestern Professor Sarah Fraser (Art History) on the Dunhuang Caves Project.

NSF/JISC Digital Libraries Grant
NUIT is partnering with Professor Jerry Goldman of Northwestern University on a 5-year, digital library grant from the National Science Foundation to develop expanded audio library capabilities. NUIT will provide hardware, database and archive technology support.

Ayeware Project
NUIT has worked for the last two years on an online governance system and a classroom research tool, called Ayeware, supporting Professors Dieremeier and Feddersen of the Kellogg School of Management. In fiscal year 2003 we plan to evaluate other potential funding partners to expand this work. For example, talks are underway with OpenText Corporation about possible co-development of Ayeware on top of their document management and collaboration system.

OKI-Mellon Grant Proposals
OKI is the Open Knowledge Initiative (OKI) funded by the Andrew F. Mellon Foundation and led by a team at the Massachusetts Institute of Technology to develop the next-generation of course management system architectures. NUIT has submitted two grant proposals to Mellon for development of OKI-compliant online seminar tool.
Northwestern University Information Technology partners with local, state, national and international government agencies; corporations; foundations and other academic institutions to explore emerging technologies. These include:

**Government Agencies In:**

City of Chicago  
City of Evanston  
State of Illinois  
U. S. Federal Government  
Canada  
Germany  

City of Chicago  
City of Evanston  
State of Illinois  
U. S. Federal Government  
Canada  
Germany

**Corporations:**

Avaya  
Cisco Systems, Inc.  
IBM Corporation  
Nortel Networks  
SBC Ameritech  
Sun Microsystems  
Teleglobe Communications, Inc.

**Collaborative Relationships:**

APAN – The Asia Pacific Advanced Network  
AREN – The Advanced Research and Education Network  
Argonne National Laboratory – Electronic and Computing Technologies Division, Mathematics and Computer Science Division  
CANARIE – The Canadian Network for the Advancement of Research, Industry, and Education  
CERN – The European Organization for Nuclear Research (High Energy Physics)  
Chinese Academy of Sciences  
EVL – The Electronic Visualization Laboratory at the University of Illinois at Chicago  
Fermi National Accelerator Laboratory  
GiDVN – Global Internet Digital Video Network  
HARnet – Hong Kong Research and Education Network  
iGRID – An International Grid for Global Community Networking  
I-WIRE – Illinois Wired/Wireless Infrastructure for Education and Research  
MERIT – Michigan State-wide Network  
MREN – Metropolitan Research and Education Network  
NaukaNet – Russian Science Research Technology Network  
NCSA/PACI – National Computational Science Alliance/Partners for Advanced Computing Infrastructure  
NGI/NGIX – Next Generation Internet Initiative  
NLANR – National Laboratory for Advanced Networking Research  
OARnet - Ohio Academic Resource Network  
QUILT – Advanced Regional Networking Organization  
SARA – Dutch national expertise center in the field of high performance computing and high performance networking  
STAR TAP – Science, Technology and Research Transit Access Point Project (NSF)  
SURFnet – A national computer network for higher education in the Netherlands  
Telemetric – The Center for Telematics and Information Technology at University of Twente  
TeraGrid – Multi-year effort to build and deploy world’s largest, fastest infrastructure for open scientific research/NSF  
UCAID – University Consortium for Advanced Internet Development  
University of Chicago  
University of Illinois at Chicago  
University of Illinois at Urbana - Champaign  
vBNS – Very high-speed Backbone Network Service  
WTCM – Science and Technology Research Center in Amsterdam
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