North Dakota State University

Department of

Information Technology Services

Higher Education Computer Network
South Host Site

Annual Report
Fiscal Year
1999-2000

Ending June 30
Vision, and planning, played key role in 1999-2000 success

Information Technology Services has just completed another unusual but rewarding year. We saw 2000 begin with hardly a "Y2K" glitch only to be followed by a disastrous flood in June. The investment of a great deal of time and talent by staff in addressing these two events has had nothing but positive results. However, these events magnified the important role information technology plays in our daily work. We are now challenged to take what we learned by these events and develop plans that guarantee continuous access to the resources we need in our daily lives—no matter what goes on in the environment around us.

In the pages that follow, many activities of this past year are identified. You will find descriptions of new services, new collaborations, new technologies and new challenges. A dedicated staff have enabled ITS to move forward and into the new millennium at lightening speed, achieving many accomplishments over the course of this past year.

Bonnie Neas, Director
Information Technology Services

Information Technology Services is dedicated to providing academic, research and business technology solutions to the North Dakota State University System and its constituents. We support and live the land grant ideals in an environment of collaboration, teamwork, and individual initiative.

www.ndsu.edu/its
Information Technology Services provides North Dakota State University and its global community support services for multiple technologies and system platforms. These include networking and information services related to the technology environment of the University System. ITS serves as the South Host Site for the Higher Education Computer Network (HECN). As such, it provides leadership by coordinating academic and research computing support services for the University system, HECN and NDSU.

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Publication date
September 18, 2000
The Higher Education Computer Network (HECN) is a partnership established to encourage campuses to work together to leverage knowledge, financial resources, and people resources.

Collaboration strong focus of HECN support

The successful relationship of ITS and the HECN is built upon a mutual mission to bring people together as partners to help advance technology at an ever-increasing pace. Through the leveraging of HECN resources, staff support, and specialized knowledge, campuses can take advantage of the economies of scale in support of advancing their own technology initiatives.

Working together to meet the growing challenges of implementing and deploying new technologies, rather than duplicating services, is the direction ITS continues to pursue. ITS will continue to strengthen the core services it provides to the HECN to meet the global technology challenges of the new millennium.

Our HECN ties

By working together we can accomplish things beyond our wildest imagination.

HECN continues to be a role model for how collaboration works within the North Dakota University System. The staffs of the two HECN host sites work tirelessly together to provide robust services, such as Internet access, to all of our system’s students, faculty and staff. Other HECN South offerings include Help Desk services, training, e-mail and software site licenses. These are only a few examples of how working together brings more positive results than working alone.

The North Dakota Higher Education Computer Network (HECN) is a cooperative effort among the 11 campuses of the North Dakota University System. Information Technology Services at NDSU serves as the South Host Site, and is responsible for providing advanced network resources and technological expertise enabling students, faculty and staff across the state to access state-of-the-art technologies as tools for enhancing teaching, research, and learning.

— www.nodak.edu/hecn
Information Technology Services at North Dakota State University plays a significant role in continuing to develop and support the infrastructure of the academic computing environment for the HECN. Over the past year efforts have focused on expanding and developing infrastructure within a framework of a Category of Service (COS) model. The COS model has been in development over the last three years and provides for an opportunity to better meet the specific IT needs of our constituents. The model focuses on defining a group of services to be delivered to the HECN constituency and then developing and building infrastructure systems with appropriate levels of service and quality guarantees.

Over the last year, numerous individuals worked on a project to migrate the HECN users from the current general purpose servers (plains, prairie and badlands) to the model of institutional specific messaging servers. The task force, charged with planning, developing and deploying changes in the area of messaging (e-mail) executed a smooth transition. Architecturing a new infrastructure, developing general policies and guidelines for the transition process, and creating user documentation for the new IMAP e-mail services was all part of an effort to promote a degree of standardization to reduce overall management costs. The new server infrastructure promotes organizational autonomy, identity and independence and allows for access to a system-wide directory service.

ITS staff actively work with HECN campuses to support a variety of hands-on needs. We have assisted with Macintosh support and WAN and LAN environments, initiated security and ethical use policy administration, held numerous training sessions; and staff have shared knowledge about IT planning, lead a statewide desktop video conferencing project, and participated in the RFP for updating the state network. We continually monitor network activity both within ND and with the Great Plains Network, Internet2 and the commodity Internet to anticipate and ward off problems before they occur. With the growth and demand of e-mail lists, LISTSERV® support for both users and list administrators is ongoing. At the end of the year, 1,405 e-mail lists were defined on the LISTSERV® server.

Several ITS staff members are part of an extensive administrative printing conversion to new software called PageCenter. PageCenter made its debut at NDSU and UND in February, 2000, when a few previously selected, month-end reports were adapted to make use of this new program. At NDSU the project was successfully piloted with help from the Accounting Office and the Internal Auditor. During the 5 month pilot, documentation was created, nearly 3,000 pagesets were created, and 21 training sessions were offered to over 150 administrative staff. PageCenter will be rolled out to the HECN this coming year, changing the way administrative batch reports are distributed on campus.

The HECN Help Desk Project, or Remedy, as it has been more commonly know, revolves around the concept of a shared application to promote better tracking of help desk calls and access appropriate solutions using a searchable database. The Help Center, a new interface to the Remedy help desk application, was introduced to provide easier access for technicians to check the status of calls and track customer follow-ups. Changes included form revisions, and automatic escalation notifications on follow-ups. Development on a new interface to a solutions database will help manage the solution creation and editing process. Plans are underway to integrate this into the Help Center, and make it accessible to users to search for information via the web.
Training needs across the HECN continue to grow. Maintaining a knowledge-base on new software or new versions of a program is often difficult for campuses with limited staffing resources. ITS trainers have traveled to Bismarck, Devils Lake, Minot and Wahpeton campuses to provide training on Word 1 & 2, HTML, Netscape Composer, Eudora, Excel, Windows File Management and PowerPoint. This past year, over 100 contact hours were logged, serving 268 participants.

Arrangements were made for HECN sites to view a presentation over IVN by NETg On-line Learning with a follow-up opportunity to try the product. Training also was provided to assist campuses with the Y2K transition. In addition, “Tech Dayz” hosted by the HECN South host, provided for a two day informational exchange with the HECN coordinators.

Staff were called upon to assist with training on general desktop support, particularly with Macintosh computers and with using disk imaging software.

The ND legislature this past year called for all campuses to develop extensive IT Plans. To help streamline and coordinate activities at the campus levels, an ITS staff member assisted the North Dakota University System CIO in working with the Information Technology Department to collect data, clarify preparation, and handle assignments.

The rich knowledge-base of ITS staff members continues to be shared across the state. ITS maintains a central domain system and IP assignment services to the HECN, defining standards and setting policies on domain names. Staff from ITS investigate security threats and network compromises or acceptable use issues which often involve the development of appropriate responses and policies. To satisfy a legal and administrative requirement for the system, an ITS staff member with the appropriate expertise level was designated to serve as Digital Millennium Copyright Act Designated Agent for the University System.

ITS staff have developed a new service management page that serves as a single point for requesting e-mail, changing passwords, forwarding e-mail, and requesting a variety of other HECN services. This page can be found at http://enroll.nodak.edu and requires users to take the HECN Acceptable Use Quiz the first time they enter the site. The quiz was also revised this year.

The HECN Software Licensing Program processed 736 electronic orders for software totaling $219,793, amounting to an equivalent amount of savings to the University System. The program allows the University System to take advantage of cost-savings through volume discount purchasing. Microsoft products, Corel WordPerfect, ESRI Geographical Information Systems applications, AutoDesk CAD products, SAS and SPSS statistical software, and Mathematica are software packages available through this program.
ITS relationships build trusting environment

If you talk to any ITS staff member who has left the organization they will generally tell you that the people really made the difference. Strong dynamic relationships have been formed which signify the building of a trusting workforce. People do care about each other, support each other, and share the good times as well as the bad times much like a family, solidifying a strong team commitment which bonds the organization together.

ITS staff are called upon to wear numerous hats—and they do so with a congenial "whatever it takes attitude." This attitude is primarily due to the open, flexible environment in which staff feel they can make a difference, often going beyond the call of duty to achieve the many goals of the organization.

ITS makes training and professional development a high priority. We believe the financial investment made in this area helps to retain a strong work force. Offering challenging work and the freedom to pursue and gain more knowledge and skills through an aggressive professional development program serves as incentive in the recruiting of new staff as well.

Deadlines are constant, adapting to change continuous, and learning new technologies endless. Couple that with Y2K efforts this past year and the unexpected June flood, it is evident that ITS staff are hard to match for their work ethic and dedication to getting the job done.

ITS staff have established a work culture which emphasizes team work and collaboration, yet each and every staff member has, in their own way, made a significant contribution to the organization. A list of recognitions, accomplishments, awards, papers, and certifications are noted on page nine of this report.

The many dedicated, creative, and extremely knowledgeable staff have helped ITS and the University System achieve tremendous goals. Their talents and contributions are often far-reaching and are recognized at national levels as well.

Considering the extreme competition for IT workers, retaining and recruiting such a high caliber of staff will be a continual challenge.
Information Services group provides diverse support services

The staff of Information Services promote, deliver, support, and continually investigate quality technology solutions and tools to enhance learning and business productivity. Information Services is comprised of 8 functional work groups: Administrative Applications Development Group, Administrative Printing, Client Services, the ITS Facilities Group, the ITS Help Desk, Internet Strategic Applications Group, SENDIT Technology Services, and the ITS Training Group. Core services include:

- Help Desk and documentation services
- Software Site License Program
- Strategic internet use support and monitoring
- Consulting, training and education
- Student computer clusters and instrumented classrooms
- Classroom technology design and support
- Printing, plotting, OMR scanning, electronic distribution of reports
- Administrative applications development
- K-12 consulting and internet support

Information Services staff work together as teams to assist HECN, NDSU and K-12 clients in using appropriate technologies to accomplish their goals. IS staff are committed to excellence in promoting and delivering information technology services and solutions, advancing the ITS mission through collaborative partnerships.

Learning Technologies bridges learning and information technology

The Digital Conferencing group manages a state-wide task-force to research desktop video conferencing technologies and recommend quality point-to-point and multipoint IP-based video conferencing solutions to NDUS and the state government.

The Instructional Technology Group bridges learning and technology by developing learning applications and providing distributed learning services for faculty and staff.

ITS and the Department of Statistics jointly support the Statistical Consulting Service at North Dakota State University. This service is available to all faculty, staff and students at North Dakota University System institutions.

The goal of the ITS WWW Development Team is to provide World Wide Web (WWW) services to NDSU faculty and staff unit representatives, to develop and manage WWW sites for ITS, and to train NDSU faculty and staff unit representatives in the use of the Web Development toolkit supported by ITS.

An organization is only as strong as its people—and ITS is a VERY strong organization. I'm very proud to be part of an organization who has a very talented and committed group of people who work hard to provide the best they can for those they serve. We place a high priority on professional development because our service can only be as good as what we know. In this environment, new learning is the default. We need to continue learning so that we can provide effective services.

— Bonnie Neas
Networks and multi-user systems component for delivery of technology

The NDSU network group manages the NDSU local area network (LAN) and connections from the LAN to the Internet and Internet2. Services include wiring, network equipment installation and configuration, troubleshooting, planning and design, and network security. In addition to full data networking services, the network services group also provides infrastructure design, installation, and maintenance for the NDSU physical plant (telephone, security, cable TV, environmental control, point-of-sale).

The Multi-user systems group manages the computer server infrastructure for the NDSU campus and for the Higher Education Computer Network (HECN) South site. These servers provide many basic services such as file and print services, email, and World Wide Web. In addition, many specialized, server-based applications are provided to meet the needs of the academic and research communities for NDSU and the HECN.

Essential to ITS —skilled and diverse support staff

Administrative and budgetary support staff play an integral and fundamental role within ITS. Complex budget, accounting, human resource support, and daily communication processes are handled by the cooperative effort of the administrative support staff. These staff are relied upon every day to help keep communication and paperwork flowing within the organization. Although the members of this team have different areas of responsibility, they work together to support one another on a daily basis.

Students gain skills, and share knowledge

ITS has a strong heritage of providing students opportunities for on-the-job learning. Over 100 students work side-by-side with full-time staff members, applying their skills in real-life work environment. Knowledge is continually shared between staff and students. Students contribute to the work efforts of individual faculty members, particularly in the areas of web and multimedia design. This year, before classes started, ITS conducted a two-day student orientation program to review safety issues, customer service, and guidelines and policies of ITS. Additional specialized training is also provided. Student employees are an essential part of the ITS organization. We rely on them to help us meet the growing demand for technology support.

Staff Recognitions

Years of Service Awards:

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<td>Brian Abraham</td>
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<td>Marty Hoag</td>
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Awards:

Internet2 Innovation Award (for outstanding contributions to normal science at the 1999 Internet2 Megaconference)

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<td>Marty Hoag</td>
<td>Sandy Sprafka</td>
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<td>Rosi Kloberdanz</td>
<td>Joel Writer</td>
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<td>Bruce Curtis</td>
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Certifications/ Degrees:

- John Underwood, CCNA (Cisco Certified Networking Associate)
- Gary Whaley, MCSE (Microsoft Certified System Engineer)
- Terry Wieland, RCDD (Recertified - Registered Communication Distribution Designer)
- Cathy Hanson, PHR (Recertified - Professional in Human Resources)
- Felix Guerrero (Received M.S. in Zoology)

Papers:

See appendix
ITS partnerships benefit a wide spectrum of research activity

ITS supports a strong collaborative effort with the research community at NDSU which ultimately benefits the HECN constituency. To move forward with research collaborations requires the advanced use of our networks and a high-level of technical expertise.

Support has been provided to the electron microscopy lab for the on-line storage and archival of microscope images. A close working relationship has also been maintained with a research group in the Department of Computer Science to work on issues of networked database development and component based message delivery. This participation has included contributions to the Virtual Archive Storage Terminal (VAST) which received an initial $250,000.00 in federal funding.

ITS has also helped the archaeology department develop a system for the on-line archiving of three dimensional images of artifacts. The system leverages network and imaging technology to reduce geographical and logistical barriers in the study of artifacts. Additional NSF funding is being sought to extend the technology.

The use of high-performance clustered computing facilities known as the HURD and MIDAS continue to support researchers. New research and methods papers involving numerical simulations conducted on the HURD have been published.

Other efforts have involved bringing new quantum mechanical programs on-line which are being used to support research in the area of drug-protein interactions.

Once again, ITS provided coordination and technical expertise between NDSU and Senator Byron Dorgan’s office for the “Telecommunications Technology in North Dakota” conference. The conference, held May 31, 2000, focused on a theme entitled “Opportunities and Challenges for Rural America.” ITS staff also worked with the seniors group, providing hands-on computer training and internet access. The conference was attended by nearly 500 participants from across the state.
Collaborative efforts are seen throughout NDSU and extend beyond the immediate campus environment

Client Services staff have been an active partner with the Group Decision Center supporting the technical needs of the program.

CSG staff worked with the Memorial Union to install a new server which uses Events Management Software (EMS) to enhance scheduling capabilities. Video conferencing centers are becoming a popular communication means. ITS staff have been involved with discussions regarding centers with the School of Education, and the Department of Apparel, Textiles and Interior Design. Staff worked with the College of Agriculture to help secure a grant to place video conferencing equipment at several research extension centers around the state. The staff were also consulted in regard to the video conferencing needs of the Skills and Technology Training Center.

Working together with the Health, Physical Education & Recreation Department, and the Communications Department, several Women’s Volleyball games were aired over Web Radio. The College of Arts, Humanities and Social Sciences has since continued to enhance the Web Radio Project, partnering with ITS as a resource for technical issues.

The Skills and Technology Training Center is a joint venture between NDSU, North Dakota State School of Science and the surrounding communities which it serves. ITS has provided computer support services for the STTC, and has completed networking of the building this past year. ITS staff provided LAN and desktop support to the center, and are also involved with the Cisco Regional Academy.

SENDIT Technology Services (STS) serves as an internet support center for North Dakota K-12 schools and libraries. A unique partnership between ITS and SENDIT has existed for over 10 years, allowing technology support and service to be extended throughout the state and into many rural communities. This past year ND School Net and SENDIT merged into one organization forming SENDIT Technology Service. The merger allows staff to develop and implement new services under one name, one plan, and one budget.

SENDIT Technology Services staff presented at six statewide conferences, offered eight road shows and presented thirty workshops across the state to inform and teach educators about the services offered by STC. SENDIT Technology Services hosts over 33,000 users who generate at least 1.2 million e-mail messages a month. The SENDIT Help Desk received an average of 500 e-mail messages and 250 calls each month. This past year nearly 600 educators participated in various training programs. SENDIT Technology Services continues to extend its relationships and collaborative efforts throughout the state, helping to bring state-of-the-art technology to the forefront of the K-12 classroom environment across North Dakota.

"To produce something of value that is not specifically yours or mine, requires an investment in a relationship that is ours."
— Workforce Magazine August 2000

ITS staff have been involved with many collaborative "cutting edge" technology experiments and events. The following represents a partial listing:

• Web Radio Project
• Internet2 Mega Conference
• Remote 2000 Class
• Access Grid project
• Multicast deployment
• IP-based Desktop Video conferencing
• Web-based submission, review and viewing of proceedings of the Midwest Instructional Computing Symposium
• Active Measurement Program
• Investigation of digital signatures/certificates
There are many demands placed upon us for numerous types of services. Whether it be for infrastructure or support services, staff continually meet face-to-face with constituents to learn and discuss the possibilities of how we can help.

Staff strive to develop and support a set of core services essential to carrying out the ITS mission of "...providing academic, research, and business technology solutions to the North Dakota University System and its constituents..."

Prioritizing the volume of work to satisfy the constant request for expanded and new services continues to be a challenge.

A WWW development team was formulated to assist various departments and offices with the redesign and look of their web pages. ITS staff and students assisted offices such as EEO, Accounting and Business, Business College, and International Services and others, to have a more pronounced appearance on NDSU’s web.

ITS continues to provide ongoing support for administrative application development. We’ve worked on projects with Alumni, Budget Office, Counseling & Disabilities Services, Graduate School, ITS, Motorpool, Nursing, Pesticide Office, Student Academic Affairs, Student Health, College of Pharmacy, Construction Mgmt & Eng, Project Success, Registrar, and Sociology. Need for help in this area continues to grow.

Staff have been working diligently to provide help in understanding how viruses invade machines and initiated an active campaign to deploy anti-virus solutions throughout the University System environment. This was critical during the Y2K period when viruses ran rampant.

— Customer Service is key word for ITS staff.
Our clients get help from us in so many different ways.
The Service Center has taken on the responsibility for handling the scheduling of various computer labs on campus. Technology Fee dollars enabled ITS to add a staff person to better manage the task of cluster reservations and equipment checkout. The demand for cluster usage continues to rise as both students and faculty make use of the facilities. The classroom clusters are used heavily by instructors. To enhance the scheduling process, specialized scheduling software was purchased.

To answer computer questions and provide helpful information about the services of ITS the help@ndsu publication once again was distributed throughout the campus during the Fall of 1999. This publication received a 2nd place award in the newsletter competition at an annual ACM Special Interest Group on University and College Computing Services conference. In addition, the Help Desk implemented a new status messaging system which allows callers to quickly be alerted to any current networking outages taking place. Work has begun to enhance on-line documentation to provide for clearer and more precise instructions regarding the many "how-to" computing questions.

ITS staff are on the scenes when desktop machines go haywire or new systems are added, but it doesn’t end there. Staff serve as consultants to aid departments with special needs, software updates, anti-virus programs, printer problems or networking solutions. Desktop support extends to working with cluster machines as well, supporting 325 PCs and 115 Macs in 25 different rooms throughout the campus.
Special attention is also paid to those students who take classes through distance education. ITS assists students in meeting their educational needs by linking these students with the resources available through the Interactive Video Network. Students call us to enroll, obtain textbooks, receive classroom materials and acquire information on future course offerings.

New students to campus often need help understanding our computer technology and how to best to make use of the many services ITS has to offer. Staff continue to work with the academic program, "Skills for Academic Success 199" to help provide instruction, answer questions and assist students in becoming comfortable with the available technology on campus.

The newly created Cluster and Classroom Service Center merged a variety of services together to improve services to our customers. By combining the support provided ACM student cluster consultants (ACMCO) and the student multimedia consultants, knowledge can be more readily shared with each other, more cross-training can take place, and student scheduling is more adaptable. This arrangement offers students, faculty and staff a "one-stop" center for cluster and classroom computing services.

A wide-range of services is supported by the cluster consultants. Under the supervision of full-time staff these student employees act as "tutors" assisting other students needing help with computers and software problems. Consultants answer questions from students of varying degree, ranging from users with limited skills to highly proficient skills. The consultants also replace printer toners and refill printers with paper along with coordinating problems with the ITS hardware technicians. In addition, they provide monitoring services for the cluster labs in IACC building.

The student consultants assist with burning CD's, scanning pictures and text, creating large audio-video presentations that require zip or jaz disc storage, and supporting specialized multimedia software. The multimedia lab is the only public area on campus where movie clips can be digitized, audio clips recorded, and CD's created. New advanced equipment is continually being added to maximize the exposure students have to new technologies.

The color and plotter printers have become extremely popular. Additional printers and a plotter were purchased this year to help meet the demand for use and decrease wait time.

Additionally, a large array of equipment is available for check out and a list is provided in the appendix.
The Technology Learning Center, funded by Technology Fees, focuses on providing computer training for students at all skill levels. Sessions include training on many popular software programs as well as on internet and e-mail programs. The sessions are short and are offered at convenient times for students. The TLC this past year offered 106 computer training sessions serving almost 500 students. Additionally, 82 training sessions were requested by instructors—serving 861 students. The TLC, under the direction of a full-time staff member, uses student instructors to help conduct the various training.

The questions many students ask when looking at a university environment are, "What are the computing facilities like? How many systems are there? How old are the computers?" ITS supports numerous computer clusters throughout the campus. The facilities are continually upgraded with high-performing systems and peripherals, as well as current software. The machines owned by ITS are on a three year replacement cycle which gives students access to fairly new equipment. The adjacent table provides information about the cluster environments supported by ITS.

### Cluster Labs supported by ITS

**New Clusters:**
- Ehly 119 - 18 Dells, w/Video conferencing capabilities
- Morrill 111 - 14 Dells, "Team Building Classroom"

**Cluster Statistics**
- 12 different buildings have cluster labs
- 25 different rooms
  - 20 rooms can be reserved for classes
  - 7 rooms are open 24 hrs - 7 days/week
- Total Computers: 440 --- 115 Macintoshes 325 PCs
- Total Printers: 54

Through the Technology Fee Awards, ITS continues to support free black and white cluster printing services to all students. High-tech multimedia equipment, specialty clusters, and student training needs are also sustained through allocated funds from Technology Fees. In addition, these funds help foster numerous other technology advances on behalf of the students at NDSU. ITS received $638,053 of new money from this source of funding. Many of our programs could not be offered without the favorable support of members on the Technology Fee Committee, which include students, faculty and staff. A complete list of Technology Fee funded projects can be found in the appendix of this report.

More and more students are coming to campus with their own computers. With the residence halls fully networked, ITS supported approximately 1200 ResNet users who took advantage of connecting to the network from their room. The ResNet program assists students with setup and connectivity problems. The number of computers in the residence halls has grown 40% from 1000 to 1400 machines. Having a direct backbone connection from the residence halls helps to decrease traffic through the modem pool lines. Dial-in modem pool access still remains high with about 3,000 active users.
ITS is not just about infrastructure or solving computer hardware and software problems. Our mission is to enable faculty and staff to use technology tools efficiently and effectively in their daily work. We strive to provide resources and assistance so faculty and staff are able to use technology to the fullest extent. Whether it’s faculty member in a teaching classroom, a researcher collecting data, or a staff member working with a spreadsheet, we want to help advance user technology competency, research capabilities, and technical skill levels.

ITS staff launched a new and fun way to learn the ins-and-outs of the web. "Web Boot Camp," a 2-day intensive seminar, was created to provide participants with an opportunity to tie all the pieces of the web together. By learning or reviewing HTML, Composer, Dreamweaver, web design, file transfer, interactive form building and graphic basics, participants are able to meld the whole web experience together and feel more competent.

A distributed learning system was purchased this past year as a move to help faculty more easily use the web as a learning tool. Blackboard Campus is the underlying system that unifies academic computing resources and integrates with existing back-office systems. ITS staff provide support and training for CourseInfo, a web-based tool suite used to help faculty and staff build and manage information, including course and training materials, virtual courses and classrooms. Features of CourseInfo include announcements, updates, and reminders page; quiz generator; on-line gradebook; whiteboard, chat, and threaded discussions. Use of such a teaching delivery system has become extremely popular in number of classes. NDSU currently has over 250 CourseInfo courses and over 5,000 users.
ITS, the Computer Science Department and Minnesota State University Moorhead worked on a collaborative project to implement an IP-based video conferencing classroom experience. The Remote 2000 project provided an opportunity to research and implement innovative computer-based connections between sites that allowed the instructors and students to clearly see materials and collaborate in new ways. This was truly a significant test of the teaching and learning opportunities and problems associated with distant-site collaboration.

Security issues are always a threat to the campus network. Staff and HECN constituents have formed a Security Incident Response Team (SIRT) to help detect, identify, investigate and remediate network security incidents and issues, helping to maintain a consistent, reliable network for all users.

Assistance is provided to faculty, staff and students with planning, managing, processing, and presenting data associated with research projects. A staff member and graduate students from the Statistics program help to compile data for clients by customizing programs written to SAS and assist with analyzing the data collected. Statistical consulting logs show contacts were made with over 250 different clients. Faculty from NDSU, other colleagues from Jamestown, North Dakota, and professors at Minnesota State University Moorhead have used the resources and expertise of the statistical consulting group in the writing of research papers. The, ITS statistical consultant was coauthor of these papers and gave presentations with these faculty and graduate students regarding the research work conducted. Various trade journals have published the works of these professionals.

A project team to build an “Access Grid” node at NDSU was formed to expand teaching, research, and learning opportunities using this technology. The Access Grid project fundamentally is an applied research activity, not yet fully developed to function as a production system. However, as part of its development, it is being used for many “production” activities, such as, project collaborations, high-performance computing training and seminars, and “Chautauqua” events. ITS staff joined with parties from all over the nation to collaborate in two of the Chautauqua events to explore the strengths and weaknesses of using this remote-site environment. A highlight for several staff was our ability to view and participate in a high-performance computing “Chautauqua” event late summer of 1999. Dozens of people in many locations across the country helped coordinate the activities and were part of this broadcast event. ITS staff and a number of faculty members were able to view presentations on Superclusters using this technology mechanism.

Multimedia cart reservations have increased over 40% this past year creating an even stronger need for support services. Six projectors on multimedia carts, and two checkout projectors in the Service Center have been updated. In addition 15 new overhead projectors have been purchased for campus usage.

ITS continued the initiative of more instrumented classroom environments to provide improved quality in computer-aided classrooms.
The growing storage requirements of NDSU and the HECN continues to be a major concern. ITS is an early adopter of the storage area network (SAN) model and is continuing to grow this infrastructure. The NDSU SAN currently provides 750 gigabytes of storage and we expect this to more than double within the next two years. Considering one GB of storage holds approximately 670 million pages of text, our storage capacity need is phenomenal. The deployment of additional storage space will help to support service delivery and improve backup capabilities.

The technical infrastructure at NDSU continues to evolve rapidly as the demands of our users and the services they need changes. The NDSU campus network is being upgraded to gigabit speeds at the core. Concurrently, connections to offices within buildings will be upgraded to switched 10/100 Mb from the current shared 10Mb service. Internet connectivity bandwidth is also being increased. It is expected that the demand for bandwidth will continue to grow. Another area of increasing concern is network security; protecting the University from attacks and insuring that we are not an originating site for outgoing attacks. New software and equipment is being installed to help monitor our security and to help us respond appropriately.

Data network and servers are core elements of infrastructure

Staff have been working for the last year on a major upgrade of the campus core network and the backbone network located in the Industrial Agriculture Communications Center (IACC). The redesign of these networks will support greater connectivity speed, increase efficiency of data management, and accommodate for future growth of advanced technologies.

A high level requirements document was developed and circulated for comment, and an RFP was initiated for leading data networking providers to respond to for product and support. The upgrade within the IACC complex offers switched 10Mb connectivity to the desktop and plans are in process to roll out this connectivity to the rest of campus buildings over the next several years. Although we are pleased with the progress of the network redesign, the June flood has caused a delay in completing the upgrades and work is still in progress.

The operations center, or server machine room, is also being redesigned. In addition to standard networking, the operations center will feature fiber optic systems to support the ongoing development of a Storage Area Network. Facilities for remote management of electrical power are also being installed. Again, the flood has hampered the completion of the upgrade. The end result however, will be a state-of-the-art server operations center.
Developing and maintaining a consistent, coherent and maintainable infrastructure is a significant challenge to ITS staff. Keeping pace with deploying new technologies and enhancing services requires constant upgrades and changes to the system. Continued work and development within the context of a network-enabled computing environment will provide systems with the ability to support increased service level needs and decrease hardware and support costs.

ITS system administrators worked internally to develop the essential components of the new service delivery structure. The work was conducted within the framework of a project known as the User Services Management System (USMS). Development of this multi-component system included the areas of user database development, LDAP directory deployment and the Kerberos authentication system. The USMS also provides an important technology foundation needed to support the delivery of future services. Most importantly, the concept of an HECN-wide directory system and organizational specific security realms will be important for the development and delivery of digital identification services.

A significant culmination of this work occurred in late summer 2000 when five new institutional server machines were brought on-line to support the HECN member institutions participating in the new services infrastructure. These servers will support the messaging needs of the member institutions. The new server infrastructure promotes organizational autonomy, identity and independence while leveraging standardization to increase maintainability and reduce ownership and management costs.

Infrastructure management performed an integral role during the Y2K transition and with the restoration of network and e-mail services after the flood. Months of preparation for the millennium transition resulted in no significant service interruptions for the University System. Quickly restoring networks and services after the flood was critical to helping the campus cope with the loss of voice communication.

Consolidating and simplifying the server infrastructure is ongoing. Two new SUN servers were brought on-line as commercial components of the server infrastructure. These servers support Oracle service delivery as well as the Statistical Analysis System (SAS) and general computing. In addition to the SUN systems a large number of Intel based Linux servers have been deployed in a standardized environment to support various services. As consolidation occurs, work continues toward removing a large number of older legacy systems from service. Overall, this is reducing administrative overhead costs and increasing service reliability.

The biggest challenge remaining for both networking and server infrastructures is business continuity or disaster recovery. This past year, with the summer flooding, it became evident that we must take steps to improve our ability to survive disaster situations as so much of the NDSU and HECN now depend on the availability of the services this infrastructure makes possible.
Preparing for Y2K involved the efforts of all staff. Each area within ITS had key roles and responsibilities to seeing that the institution was ready for the rollover. The network services area held primary responsibility for ensuring that all of the network components were Y2K ready and that contingency plans developed for all network applications and services. ITS staff developed, coordinated and maintained the Y2K compliance database for the NDSU campus.

ITS (HECN–South Host) had great success using the Operational Plan staff developed to stay ahead of the millennium transition. As planned, the staff took all servers and services off-line at noon, December 31, 1999. All data and applications were backed up. NDSU began to place systems and facilities back on-line at 0:15 a.m., January 1, 2000. Each system was verified and tested in turn. All systems were operational by 3:05 a.m. Client Services and select users continued testing the services throughout New Year’s Day, and no issues of consequence were reported.

Several ITS staff members were involved with a statewide IP-based desktop video conferencing project. The task force worked with the Information Technology Department to develop recommendations for desktop video conferencing equipment. Three levels of equipment were recommended as standards, with evaluation and research in this area ongoing.

Projects
- Millennium Transition
- Common Calendaring
- IT Planning
- Video conferencing project
- Enroll process
- Web Radio Project
- Access Grid
- Flood Recovery
and many more

ITS seems to have a niche when it comes to engaging in "projects." Much of what we do stems from staff getting excited about a potential new technology and what follows is a project team ready to research and delve into the possibilities. ITS staff are often juggling several projects all at the same time while still maintaining a daily work routine of their essential responsibilities. Most projects involve an array of individuals who bring their knowledge, skills, and competency to the discussion circle, enhancing the project's outcome.

Preparing for Y2K took months of planning, transition went smoothly...
Technology facilitates learning beyond the classroom walls

The new millennium begins with thoughts of where we have been and where we are going. The last two decades have been a time of great change in the higher education environment spawned by information technology. Looking ahead, information technology will continue to foster rapid changes not only to the educational environment, but also the work, home and economic environments. The following is just a brief reflection of where the future may take us.

Educational institutions will need to offer more learning opportunities and related services to students anytime and anywhere, meeting the needs of both the residential student and distance learner. Learning is coming in many new forms, from published hardcover books to on-line books, from physical labs to on-line virtual labs, from daily newspapers to on-line instant news feeds and from desktop computers to hand-held and wearing apparel electronic devices. Learning will continue to take place in on-site classrooms but will move more-and-more to the home or workplace. Access to on-line learning resources anytime and anywhere will be accommodated and more and more wireless devices will be used.

Last but not least, organizations will need to adjust to a workforce whose members are much more mobile and who have less loyalty to a work location. More employees will work at home. There will be a need to change human resources policies to reflect the needs of a changing work force.

The advances in information technology have generated an exciting time in life and the future looks equally as exciting and challenging.
Statistics quickly illustrate 1999–2000 work effort

**Faculty, staff and student training & support**
Conducted 116 training sessions; training 898 staff/faculty on a variety of software programs
Over 100 faculty/staff received additional one-on-one training sessions or support
Over 50 people have completed Web Boot Camp
The bi-weekly "Technology Lunch Box" sessions averaged 15-20 participants
The Teaching Learning Center offered 106 training sessions, serving almost 500 students

**Help Desk & desktop support**
Calls made to general support line (231-8685) total 23,150
  *of those, 16,168 calls were taken by Help Desk staff, with the remaining 6,982
    going to Software Licensing and Cluster/Classroom Service Center
Outgoing calls made by Help Desk staff - 9,935
Help Desk walk in traffic - approximately 4,000
Help Center tickets entered by NDSU for assistance - 1733
1250 e-mail users were migrated to the new mail@ndsu system
Approximately 2000 desktop computers were checked for Y2K support

**Technical infrastructure**
129 data requisitions were completed this year
287 voice requisitions were processed
300 data ports were added to the network
47,000 feet of category 5 wire were installed; 3,500 feet underground wire installed
14,543 records were processed for the Y2K compliance database

**Other areas....**
Generated 29,000,000 e-mail messages totaling 670 gigabytes
1405 e-mail lists defined on the LISTSERV® server
Contract with Great Plains Network for 20 megabits/second of commodity Internet service for the eastern HECN
Appendix

The following material is supplemental data pertaining to Information Technology Services

Additional information

Organizational chart
Organizational changes
Professional development
Spreadsheet - professional development/travel
Papers & presentations
Technology Fee Summary awards
Cluster/classroom/equipment checkout information
Graph - Weekly calls to ITS support line