

## Summary of Previous Technology Plans

### I. Technology Plan for Academic Years 1989/1990 - 1993/1994

Past technology planning efforts began in 1986 with the preparation of a Title III grant for developing a College-wide technology infrastructure. Prior to this time, Northland Pioneer College planning priorities including maintaining adequate facilities for holding classes, recruiting qualified instructors, managing transportation schedules for instructors travelling to sites spread out across a vast service area, and establishing library, administrative and student services had taken precedent over integration of information technology within the teaching/learning paradigm at Northland. The use of computer technology within the institution was modest and inconsistent at best.

Within the Title III grant proposal, several ambitious planning objectives for using technology to deliver academic resources and services throughout a vast and remote service area (21,000 square miles) were set forth. In 1987, Title III grant and College operational/capital funding enabled Northland to begin development and implementation of technology planning strategies formulated before and during academic years 1989/1990 through 1993/1994.

The following primary technology planning goals were established during this period:

- to develop and implement a distance learning system (audio/video) that would provide access to higher education for citizens residing in areas distant from Northland's scheduled class locations;
- to improve communication service for staff and students by implementing a telephony system with connectivity to Campus sites;
- to provide access to computers for student research and study activities, as well as computer technology for registration and other administrative services.

Outcome assessment for this technology planning period indicated that the College completed major planning goals including: completion of a wide area microwave network for delivery of distance learning through audio and video transmission; establishment of a college-wide telephony system; development of computer labs; and implementation of a centralized mainframe administrative system. Completion of the initiatives contributed to a number of achievements including:

- the ability for students throughout the service area to attend NPC classes in locations remote from the instructor's Campus;
- an expansion of the scope and level of curriculum available to students;
- reduction in travel time for instructor's enabling more effective use of professional service;
- more efficient use of administrative staff in data entry, retrieval and record keeping by decreasing the number of manual print-based activities;
- improvement in College-wide communication for staff connected through the telephony system.

While planning initiatives led to the establishment of the first College-wide technology infrastructure, the final 1989/1990 through 1993/1994 planning assessment study identified a number of critical issues to be resolved.

One of the most important issues identified was the need to improve the quality, reliability and functionality of the primary Wide Area Network systems -- distance learning technology, telephony, and data transfer -- to meet emerging academic and industry technical standards. After approximately six years of operation, student and faculty surveys and analysis from expert consultants indicated that the overall performance and reliability of Northland's technology infrastructure and systems was not adequate to effectively support instructional, administrative and communication services. While microwave transmission of data between towers located throughout the service area provided acceptable reliability during favorable weather conditions, rain and snow storms, lightning and other adverse conditions severely disrupted system activity and diminished transmission quality. Maintaining the system proved to be difficult since some towers were located in remote mountainous areas that were, at times, impossible for staff to reach during heavy snow fall. One factor that could hardly be predicted at the beginning of 1990 was the rapid change

in interactive video transmission technology. Within a few years, formats transmitted over WANs which produced low resolution and poor video and audio quality were replaced by compressed/decompressed formats capable of transmitting images at 30 frames per second with better resolution and improved audio via standard WAN data lines.

Another critical factor responsible for the unreliable performance of the WAN was the failure to replace existing telephone cabling, electrical wiring and other transmission circuits with more current media such as category 5 cable, fiber optic and high capacity grounding and bonding materials.

In addition to issues relevant to the quality and reliability of Northland's technology infrastructure, the College lacked formal technology standards to ensure reliable performance and to provide students and staff from all locations with equitable access to resources and services. Although interactive video and audio distance learning methodologies had been adopted at Northland, little progress toward development and implementation of new forms of instructional delivery including online courses and computer-assisted instruction had been achieved.

## **II. Technology Plan for Academic Years 1994/1995 - 1999/2000**

Based on the needs, recommendations and observations from the previous planning period, the College established two critical activities to be undertaken during the first part of the technology plan for academic years 1994/1995 through 1999/2000: (1) the College would employ consultants with expertise in developing instructional and telecommunication technology to assist in re-engineering Northland's networking technology, hardware and software applications; and (2) the College would actively pursue additional funding through grants and bond proposal to complete technology planning activities.

With the assistance of technology consultants, the College established the following goals for this planning period:

- to develop and implement a single wide area network transport medium that would deliver video/audio, voice and data formats via standard WAN land lines (T1 circuits);
- to replace the existing infrastructure topology with cabling, circuits, and other components that would not be adversely effected by weather conditions, distance and other environmental factors, and to implement adequate bonding and grounding to protect system components from electrical storms;
- to migrate from non-integrated, main-frame based systems and the various decentralized systems deployed throughout the College to an integrated client/server architecture that would provide access to networked users from public or staff computers to data stored on shared, relational data bases;
- to ensure that the following critical systems will meet or exceed community college academic and/or information industry standards: interactive distance learning system; administrative system; telephony system; library system; instructional and library student research/study computers, staff computers, and other components used for data transfer, Internet access, email and WEB publication.

The successful passage of the Northland Pioneer College District Bond Proposal and College operational/capital funding provided budget support for completing the following key planning strategies:

- the development of a entirely new infrastructure based on Asynchronous Transfer Mode (ATM) technology enabling the transport of interactive video, audio, voice and data transferred over single medium with improved quality, performance and reliability;
- the conversion from microwave transmission to land lines (T1 circuits) and implementation of adequate bonding/grounding of WAN/LAN major components to decrease disruption of system activities and protection of hardware;
- the implementation of an interactive video system based on industry standard H.320 compression enabling improved video/audio quality and reliable transmission to Campus and Center sites, including the ability to operate

all interactive video system features, tools and components from any site at any time during a distance learning session.

- the implementation of an administrative system with all modules (admissions, registration, advising, financial aid, business and other administrative applications) fully integrated and using a common relational data base.
- the implementation of approximately 800 network client workstations within instructional labs, office facilities, libraries and other areas throughout the College operating under a standard Windows NT client server operating system;
- the implementation of a telephony system with improved clarity, reliability and functionality, and the capacity to serve all full-time and part-time staff, work areas, and public service sectors;
- the establishment of an integrated group of reliable and robust servers, routers, hubs and switching equipment supporting College wide data transfer, application sharing, Internet access, email, WEB page development and publication, and network security;
- the inventory, testing and upgrade of all critical systems to meet Y2K compliance requirements.

Outcome assessment findings indicated that the planning initiatives completed during academic years 1994/1995 through 1999/2000 represented an extremely active period for Northland in the area of technology. Through the completion of several planning strategies during this period, the College achieved significant progress toward effectively incorporating technology in the teaching/learning process, improving administrative productivity and enhancing student services. Despite this progress a number of important technological issues were not resolved. Critical issues included: inadequate access to institutional resources and services, the Internet, email and other instructional and administrative applications for a large number of Northland's staff and students; the need to expand distance learning technology, electronic library resources, and other computer-based student services to Centers and Community sites; lack of training for staff and students to fully utilize technologies; the need for a formal policy and timely process for developing, publishing and managing Northland's WEB page; the need to recruit and develop qualified technical staff to support and manage technology.