

Information Technology / University Libraries
Strategic Plan 2002-2007
Revised April 2005

Executive Summary

Twenty-five years after the announcement of the IBM-PC, few would deny we are in the midst of an information/communications technology revolution. While scholars argue over the novelty of the information or knowledge we encounter, one thing is clear—we are all receiving unprecedented volumes of data and information in our daily lives through ways that could not have been imagined only a few years ago. Most people find the pace of change bewildering as they try to keep up with their own areas of specialization.

Information Technology and the Libraries, by their very nature, are at the vortex of these changes. At core are three dominant and inextricably linked themes. Rapid expansion and changes in information resources and communications technologies have resulted in **complexities** (even to accomplish heretofore common activities), compounded by **personal informational overload**, in an era in which enhanced **security** is required to protect an increasingly vital technological infrastructure.

The “perfect storm” is created when these realities confront an IT/information user that has grown accustomed to a “have it your way” fast food mentality, but lacks the time to deal with increased complexities or effectively sift through a hyper-abundance of communication. Collectively, the promise of an informational mass personalization nirvana shimmers within reach of a population that collectively appears to suffer from mass attention deficit disorder.

Our challenges as well as opportunities are clear. To keep the moving target that is our environment in sight, we must adjust our strategic plan each year. At the suggestion of the UPC last year, we have melded the strategic plans of the Libraries and IT into a single document. I believe this has resulted in a richer understanding of the synergies of the two organizations.

This document represents an update to our projections. Not surprisingly, the foci match the challenges outlined above. This document also contains the strategic plan of KUNR, the public broadcasting station located on campus, which reports to the Vice President for Information Technology.

Communications

Over the past year, the areas within IT and the Libraries have strategized on several initiatives to bridge the gap between the services available and the knowledge of those services to those who might use them. These plans include an ambitious effort to launch and maintain an extensive, redesigned, and user-friendly Web site for the services available from information technologies. The Libraries will also be launching more directed informational communications regarding authoritative resources that the electronic communications revolution have made available to our community.

Our continuous upgrading and expansion of the University’s campus fiber network makes possible several exciting initiatives. We are beginning to rebroadcast digital television content across campus and we are prepared to move forward with the first campus-wide integrated telephone system in the University’s history.

Security

Given the national concern over security, including identity theft, IT will be implementing more sophisticated authentication techniques to gain access to campus networks and resources. Keeping in mind the challenge presented by complexity, the new methods of authentication should make access to University services easier for legitimate users as we move towards more ubiquitous use of a single sign-on using the same ID for all university services, including email. More intelligence built into the network will reduce the necessity for individuals to learn and remember complex policies and procedures.

Combating Complexity

While our efforts to simplify complexity are outlined in more detail within the plan, it is appropriate to note the progress being achieved in the basic maintenance of one's own computer. The desktop PC has become increasingly complex over the last decade, as its capabilities have grown. IT's introduction of a supported desktop platform has been warmly received by many on campus who no longer need to be concerned with updating virus software or even new word processing releases. Introduced initially in the administrative areas of the campus, the IT-supported, standard desktop is now beginning to spread to the academic side of the University. Combined with easy-to-use, Web-based training software introduced this spring, the computer on one's desktop can become a source of productivity rather than frustration.

Clearly, one of the most dramatic challenges facing IT and the Libraries is preparing for the programming and move into the Knowledge Center. Scheduled to open in 2008, the Center is a physical manifestation of the University's decade-long organizational unification of information technology and libraries. One of the central tenets of the programming for the new facility is to make the complexities related to IT and information resources more manageable in a one-stop environment.

Resources

IT

The resources necessary to achieve mastery over the challenges noted at the beginning of this executive summary are incalculable. Our requested resources are far more modest. The IT/Libraries are themselves providing the biggest resource economy. The organizational combination of the various areas within Information Technology and the University Libraries over a decade ago have resulted in unimagined synergies and economies that are of interest to institutions around the country.

With a relatively modest investment in resources and a presidential philosophy that viewed information technology as a strategic asset, the University has made major strides in the area of information technology support and services over the past three years. As dependence grows on the IT infrastructure in every facet of the University's operations, we seek to consolidate as well as respond to an insatiable demand for new services and applications. The two areas of greatest need are in areas that would facilitate the expansion of Web-based information for the entirety of the University community (a Web programmer/developer) and additional funding in support of the rapidly growing area of instructional technology (WebCT).

The greatest single need in the area of IT is also the single greatest need in the efficient operation of the campus—an integrated administrative information system. No single action would have a greater impact on the campus than to change the top-down management and direction of vital administrative systems. Although beyond the immediate control of the campus,

the greatest frustration to almost every member of the University community in accomplishing her/his job or to a student completing her/his degree on time is a direct or indirect result of not having a modern, integrated information system for daily, routine administrative processes. The stark contrast of our present “systems” to the ease of use and efficiencies so common in the Web services environment gives urgency to the call for dramatic and unequivocal change. Software relics, managed centrally for all of the System and remote from and unresponsive to the specific needs of the campus, simply cannot be allowed to continue to waste precious human and economic resources. This will change; the model is dysfunctional and will eventually collapse of its own inefficiencies. One can only hope that the change can take place before the collapse.

University Libraries/Knowledge Center

While the growth of IT over the past three years has achieved marked results, the authoritative, scholarly information resources and the number of staff who make those resources available have not kept pace. As is noted in the plan, the University Libraries may be the area on campus that is financially most out of step with a march towards reaching the “next level.” The University Libraries have dramatically redirected resources, staff, and philosophies. It has taken advantage of all possible technological means to be competitive, but without an infusion of human and economic resources, it will not be able to keep pace with its traditional peers, let alone gain ground on its aspirant peers.

The University Libraries are heavily used as a campus “place” as well as an information resource. Recent statistics show that from a single vendor, Science Direct, University staff, faculty, and students download a full-text electronic article every 10 minutes, 24x7x365. Science Direct is only one of dozens of electronic databases to provide full-text journal articles to the University community. The use of library information has never been greater.

As an early adopter of electronic information resources, the University Libraries were able to negotiate multi-year favorable pricing. Those early discounts are no longer available. The inflation rate for electronic journals and related products average close to 10% per year. The Libraries’ materials budgets have increased by no more than 5% in any of the last three years.

We have run out of rabbits to pull out of the hat. Our ability *simply to continue providing what was provided the previous year* is declining substantially each year and what amounts to a relative declining budget in the face of inflation will begin to have its full impact this coming year unless there is some relief. **The Libraries require more of the funding that it generates for the campus in the state legislative formula.**

The other area in which the University must increase its support of the Libraries is in the area of staffing. The University’s staffing numbers in its Libraries have scarcely changed over the past 20 years. The Libraries require additional staffing as is outlined in its “Resources Requested” section. Once again, we have stretched available human resources as far as is possible and in many new directions. Purchase of information content is only a partial solution; today’s electronic environment requires highly skilled information professionals who can make the materials in the electronic environment accessible and to encourage the use of authoritative resources. Moreover, preparation to move to the Knowledge Center has placed additional demands on the technical processing staff.

Table of Contents

What We Do in IT and Libraries	6
What We Do in Information Technology (IT)	6
What We Do in the University Libraries	8
Fundamental Assumptions and Directions	9
Strategic Initiatives, 2004-2007	11
1. Enhance Customer Service	11
2. Implement Strategies to Ensure a high level of networking and computer security	13
3. Become a Knowledge Center	15
4. Enhance campus Web services	16
5. Improve productivity services for faculty and staff.	16
6. Serve as a partner in creating a superior technology-assisted learning environment for students and faculty	17
7. Identify, acquire, and deliver appropriate information resources to support teaching, learning, research, and outreach	18
8. Serve as a partner in building a University information environment that provides secure access to accurate and timely institutional information	20
9. Implement strategies to maximize faculty and staff use of technology while minimizing the need for user support	21
10. Support Research and Advanced Computing Applications	22
11. Maintain and enhance the campus network infrastructure	24
12. Modernize voice (telephone) services on campus	24
13. Assess, promote, preserve, and provide access to unique and regionally oriented materials; identify, organize and customize the delivery of local and regional information resources	25
14. Establish policies and practices in support of the University's information technology goals and values	26
15. Improve the Information Technology division's ability to serve the University's needs effectively	26

Resources Requested – FY 2005-2006	28
Staffing Priorities (in order)	28
Operating Priorities	29
Institutional Staffing Priorities (Initiatives anticipated to be in other plans that will require IT/Libraries support)	29
KUNR Strategic Plan	30
Appendices	34
A. IT Division Status—April 2005	35
B. Environmental Context for IT	36
C. Environmental Context for the University Libraries	40
D. Process for Planning and Resource Allocation	49

What We Do in IT and Libraries

What We Do in Information Technology (IT)

- ***Develop and maintain the campus network.*** Support network growth and increased redundancy and reliability.
 - Average bytes received from Internet each day (2004): 87,834,829,351
 - Average bytes sent to Internet each day (2004): 10,451,116,880
 - Number of hosts communicating with Internet per day:
 - Average 6,448; Maximum 11,973
 - Unique device addresses on the network Spring 2004: 12,221
- ***Develop and maintain the wireless network.*** Wireless network access is available in 32 buildings and 4 outdoor areas.
- ***Manage security for the campus network.*** Maintain border controls and firewalls, conduct security audits, and respond to security incidents.
- ***Support faculty and staff desktop computers.*** The “Supported Desktop Platform” has been installed on all IT-supported administrative faculty/staff PCs and on new PCs purchased since January 2004. The supported platform enables centralized support of the workstations, allowing automatic updates of virus applications, operating system, and application software. Academic faculty/staff PCs are also supported through the Desktop Services unit on request. IT supports a 4-year replacement cycle for PCs for state-funded faculty and staff.
- ***Provide Computing Help Desk service for students, faculty, and staff.*** Constituents may call the Help Desk or the Support Center for assistance with e-mail, computer equipment, connectivity, software, or any computing-related issue. Classroom Services (TLT) also provides assistance with any computer-related issues in classrooms.
- ***Provide centralized UNIX-based e-mail, mailing lists, and Microsoft Exchange services*** for faculty and staff.
- ***Support college and departmental computing.*** Computing Systems Administrators work in the colleges and departments to support departmental servers and other computing initiatives in their assigned areas.
- ***Provide support for Web publishing.*** Web Services develops and maintains the University Web site. Custom and template-based Web design services are provided to academic departments to ensure that Web sites are easy to maintain and conform to university standards.
- ***Maintain a comprehensive information base for authentication and authorization of services.*** Faculty, staff, and students use their NetIDs for accessing many online services.
- ***Provide support of instructional technology (audio/visual and computers) in campus classrooms.*** There are 76 “smart” classrooms from the campus pool of 118 scheduled classrooms. A basic smart classroom contains fixed technology to enable a multimedia presentation. Portable technology is also supplied for instructional uses to the remaining portions of campus. TLT consults on campus instructional technology standards, technology installation, training, and maintenance.
- ***Provide presentation technology support for campus special events.*** The campus hosts an ever-increasing number of ad hoc type events from Regents’ meeting to the President’s state

of the University address to videoconferences. These events require specialized technology and support to be successful.

- **Support online learning with WebCT.** IT staff work with faculty to integrate technology into the curriculum. At present, over 11,000 students have WebCT accounts in 650 courses/sections involving 250 faculty.
- **Develop and maintain a University data repository** that is integrated, accessible (as appropriate) and easy to use for staff, faculty, and administrators. The Campus Administrative Information System (CAIS) makes available financial, human resources and student data.
- **Manage software licenses.** IT maintains campus license agreements with Microsoft, Symantec Antivirus, Macromedia, Adobe Writer, AutoDesk, and many other software packages. Symantec Antivirus and standard Microsoft Office products are available to faculty and staff at no charge. Other software is available at significant discounts.
- **Provide network-based storage.** Network-based storage provides significant benefits for users, including large amounts of disk space for central file storage and rapid recovery from failed disks, with resources usable by multiple operating systems.
- **Support administrative applications.** IT manages the equipment and software for a wide variety of applications, including Telcomm billing, Adastra (scheduling), EMS (event management system), fsaATLAS (INS reporting), Maximo (track work orders), Assessment surveys, the University Directory, and many more.
- **Support the Noli document imaging system.** Many departments on campus use document imaging applications.
- **Support telephone services on campus.** Services include telephone installation and repair, Centrex lines (4,500), more than 70 departmental key system units, voice mail, long distance, telephone conferencing, and cell phones.
- **Provide local media production services.** Consulting, design and production of video, photo, audio and digitally based programs. Broadcast quality for dynamic media and publisher quality for paper-based projects is available.
- **Provide support for videoconferencing, campus Access Grid Node sites, and the Dynamic Media Lab.** As the campus continues to evolve towards a digital convergence, many of the resources students and faculty need become a standard expectation of IT services.
- **Provide computers for student access.** IT supports general access computing labs in Getchell Library and the Student Union (127 computers). There are an additional 135 computers in the University Libraries that are available to students. Students may check out laptops from Getchell Library and TLT (in Cain Hall).

What We Do in the University Libraries

- ***Collect, house, and provide access to tangible materials.*** Current collections include:
 - Over one million volumes of printed books and journals
 - The most extensive collection of Basque materials in the Western Hemisphere
 - The largest map collection between the Bay Area and Denver
 - The most extensive mining collection in the United States
 - An exceptional collection of primary source materials, documenting the history and development of Nevada and the University, as well as nearly 200,000 rare and unique historical photographs and millions of pages of manuscript materials
 - An extensive “regional depository” collection of U.S. government publications and a complete collection of Nevada State publications
 - A large collection of audio and video materials
- ***Collect and provide access to materials in electronic format.***
 - Electronic class reserves
 - Electronic books – 12,655
 - Electronic journals – 15,610
 - Databases - 232
- ***Provide direct information and research assistance to University faculty, staff, and students, and the general public.*** We provide assistance with finding and using information resources in all formats, found within the University’s collections, at other libraries, and on the Internet. Assistance is provided:
 - In the Libraries
 - On the web
 - In classrooms
 - In faculty offices
 - On the telephone
 - Via e-mail
 - Via online “chat” services
- ***Provide physical spaces for accessing materials, studying, using computers, and socializing.*** Spaces include Getchell Library, DeLaMare Library, Life & Health Sciences Library, and Physical Sciences Library.
- ***Create digital materials.*** We digitize primary resource materials that are one-of-a-kind objects such as photographs, historic maps, architectural drawings, and botanical slides and provide access to these objects on the Web.
- ***Support digital materials created by University faculty and used by faculty for research and instruction.***
 - Collect, process, and disseminate data sets supporting university research
 - Provide access to data sets supporting class projects
 - Support a Web gateway linking university researchers to Web-based data resources
 - Provide statistical analysis and data visualization software
 - Provide data dissemination and archiving services for researchers

Fundamental Assumptions and Directions

- User needs and the institution's mission and goals are the central drivers for all the organization's improvement efforts.
- All decisions take fully into account the impact on users. All services must be as easy as possible to understand and use.
- The University views information and technology as strategic resources, supporting and safeguarding them as critical assets.
- Policies and procedures will respect the institution's basic values (e.g., academic freedom, presumption of privacy). They will reflect the evolving framework of state and federal law and regulations (e.g., FERPA, HIPAA, USA PATRIOT Act, rapidly changing intellectual property laws). The University will comply with federal mandates that call for ensuring reasonable accommodation for disabled students.
- The University must establish a centrally managed funding mechanism for life-cycle replacement of each category of computing equipment, either building replacement and maintenance costs into the base budget or finding alternative methods of funding. Replacement cycles for standard desktop computers, computers in labs, instructional equipment (e.g., projection units, computers in classrooms), centrally managed servers, and other categories of IT equipment have been recommended and are reflected in IT budget projections.
- Basic and widely used IT core services can most effectively be provided at the campus level (e.g., e-mail, Web services, institutional information systems), with specialized academic and research computing supported at the unit level by department personnel and IT division systems administrators. In addition to demonstrable cost savings, centrally coordinated IT services, under the management of professional systems administrators, improves overall network and computing security.
- Campus-wide management and support of desktop computing, particularly for administrative units, will provide better service, efficiency, and economy of scale.
- Acquisition and delivery of high quality information must support all departments and all levels of curriculum and research. Increasing enrollments and the addition of new programs mean increased information needs.
- Information must be provided at time of need and in the most useful format. Information resources and tools must be intuitive and easy to use.
- All core IT servers will be fully redundant for maximum availability and reliability.
- Establishing purchasing standards for computing equipment and software is essential. Increased standardization will improve functionality and reduce costs.
- IT services will be as transparent as possible to users, so that users are not required to understand the IT organization in order to gain access to services. Points of access for Information Technology assistance will be kept to a minimum.

- All University personnel must understand their roles and responsibilities with regard to data, including the access, use, acquisition, and validation of data. Users are responsible for ensuring the appropriate use of data. Data custodians are responsible for ensuring appropriate access to data.
- Business and administrative processes must be migrated to integrated information systems that are responsive campus needs and that enable users to conduct transactions easily. Goals include eliminating duplicate data entry and moving towards a less paper-intensive environment for standard University processes.
- The demands for information technology funding and services will exceed the institution's ability to respond. Staff and budget resources available to IT will be reallocated on an ongoing basis to meet the highest priority needs.
- Planning for IT is ongoing, as befits a dynamic organization striving to respond appropriately to changing institutional needs, priorities, and processes.

Strategic Initiatives 2004-2007

Target dates (calendar years) and responsible Information Technology (IT) units are noted for each initiative. Budget and staffing requirements are noted if not covered by current funding. These initiatives drive role statements and corresponding performance expectations of staff members throughout the IT organization.

Abbreviations for IT units:

CC	Campus Computing
CIS	Campus Information Systems
LIB	University Libraries
TEL	Telcomm Services
TLT	Teaching & Learning Technologies
VPIT	Vice President for Information Technology
WEB	Web Services

Unit managers will develop detailed implementation plans and timelines for initiatives assigned to their respective units. Performance of individual staff members throughout the organization will be measured against progress made toward reaching or exceeding the initiatives.

1) Enhance Customer Services

Our number one priority is to provide outstanding service. IT and Library staff possess a wide variety of skills and expertise to assist the campus community to utilize current and future technologies. Our challenge is to ensure that faculty, staff and students understand the full range of services offered and how to gain access to those services. Customer service is not a strategy; it is a way of doing business.

- a) ***Improve communication with faculty, staff and students about IT and Library services.***
 - i) Migrate all content from several unit IT Web sites to a redesigned IT site before fall 2005. [2005; CIS, CC, TLT, Telcomm]
 - ii) Develop a mechanism to evaluate the effectiveness of the re-designed IT Web site. [2005; CC, WEB]
 - iii) Promote information resources that are available through the University Libraries. Develop and implement a dynamic and carefully paced marketing plan, focused on increasing faculty and student understanding of current services and highlighting expectations as the Knowledge Center becomes a reality. [2005; LIB]
 - iv) Promulgate an annual report of library statistics and summary of accomplishments to highlight the scope of library services and resources. [2005; LIB]
- b) ***Consolidate the primary points of contact for accessing IT services.*** Users should not be required to understand the IT organization in order to gain access to services. At present, users must choose one of seven service points: the Computing Help Desk, the Support Center, the main service desk in Teaching & Learning Technologies, the Library Reference Desk, Web Services, the Campus Information Systems department, or Telcomm Services. Examine the feasibility of further consolidation of user support functions. [2004-2007; CC, TLT, Telcom, LIB]

- c) ***Improve incident response tracking and evaluation.***
 - i) Evaluate the incident tracking systems that are currently in place. Determine system requirements and select a single system to unify tracking for IT service requests and work orders. [2005-2007; CC, TEL, TLT, CIS]
 - ii) Develop a system for users to place service requests via a secure Web form. Integrate service requests into the call tracking/work order system. [2005-2007; CIS, CC]
- d) ***Improve support for college and departmental computing.***
 - i) As University departments adopt the Supported Desktop Platform for desktop computing, less Systems Administrator staff time is needed to maintain the desktop computing environment. Systems Administrators will take a more proactive and strategic role in computing within the departments they support. Colleges and departments are seeking to develop a wide variety of computer systems and applications. In an unsupported environment these locally developed applications can present an unacceptable network security risk. There is also concern that database applications may contain personal student data and other sensitive information that are not properly secured. Systems Administrators will provide direction on solutions for departmental needs, working with programmer analysts in Campus Information Systems to develop custom solutions, as needed. [2004-2006; CC, CIS]
 - ii) Develop a master Service Level Agreement on which to base Service Level Agreements with individual colleges and organizational units. Put Service Level Agreements in place with all University units. [2005-2006; CC]
- e) ***Evaluate and enhance support for an expanding campus.***
 - i) Develop strategies to provide improved technology support for special segments of the University, including the University of Nevada School of Medicine (UNSOM) (north and south), Cooperative Extension (statewide), and Extended Studies. The Medical School's human IT infrastructure is woefully understaffed. This historical inadequacy grows more treacherous each year as the scope of the Medical School continues to increase. The Medical School requires numerous additional IT support positions just to reach a point where it can maintain the status quo. As additional staff are put in place, the Medical School should hire a senior position to serve as a coordinator of Medical School IT. As a separately funded entity in the state budget, the Medical School is responsible for providing the positions, but will come from IT. It should be noted that until this human resource shortfall is addressed, the Medical School places an additional and disproportionate IT support burden on the rest of the campus. [2004-2005; VPIT, CC, TLT]
 - ii) Develop a support plan for the Redfield campus. The first Redfield building is scheduled to open in fall 2005. While IT has not been requested specifically to provide for support of operations at Redfield, IT anticipates that such a request is likely to be forthcoming. At least one position, initially, will be required to support this campus. This support will be required for support of the network, telephones, desktop computers, classroom equipment, and computer labs. Determine a strategy for providing information and technology assistance to

students at the Redfield campus. [2005; CC, CIS, TLT, LIB; **requires additional funding and positions**]

- f) **Participate in implementation of a campus one-card system.**
 - i) Campus Information Systems will be an integral part of the implementation team for the one-card system. Responsibilities will include creating a private network space, hosting the database/application servers, and working with the one-card office to ensure a successful and secure implementation. [2005-2006; CIS, ongoing funding for ½ position secured; funding from One Card Project, Provost's Office]
 - ii) Replace the current ITC printing software with the UniPrint network-based printing service. [2005-2006; LIB, CC]

2) **Implement strategies to ensure a high level of network and computing security.**

It is imperative that Information Technology develop and enforce a broad spectrum of security measures to protect data integrity and proprietary resources and to prevent abuse of University computing resources.

- a) **Ensure that critical operating system and application updates are regularly installed on all desktop computers.**
 - i) The Supported Desktop Platform enables campus-wide management of the desktop, including remote updates for virus software, operating systems, and standard desktop applications. Deploy the Supported Desktop Platform on all appropriate desktops in both administrative and academic units. [2004-2007; CC; **\$200,000-\$300,000 in additional funding from 2005, depending on degree of campus adoption**]
 - ii) Under the Microsoft Campus Agreement, upgrade all PCs to Windows 2000 or Windows XP Professional. Supporting only two major variants of the Windows Operating System will simplify management and improve security. [2005-2006; CC]
 - iii) Complete purchase of a campus licensing agreement for Apple OS X. This will ensure that users stay current with the two major desktop computing operating systems—Windows and Mac OS X. [2005; CC]
- b) **Establish secure authentication for all services on the campus network using the NetID.** The foundation of basic security is a fully functioning authentication system. A goal is to eliminate the need for a user to remember multiple logins and passwords.
 - i) Deploy the NetID for secure authentication for all networked services, including network access, file services, electronic data services, Web services, and e-mail. Specific goals for 2005 are NetID authentication for Equinox e-mail users and for remote users of Library electronic resources. [2003-2007; CC, CIS, LIB]
 - ii) Coordinate with departmental computer lab managers to adopt best practices for secure server and workstation management. Encourage departments to use the NetID to control access to lab computers. [2004-2006; CC]
 - iii) Implement password “self help” so that faculty, staff, and students can be provided with prompts for forgotten passwords. [2005; CC]
- c) **Replace insecure protocols with more secure alternatives.** Currently many passwords are sent over the network as clear text and can be intercepted. Replace applications that use clear text passwords with applications that utilize more secure

- authentication mechanisms. Some applications targeted for replacement are insecure versions of FTP, Telnet, IMAP, and POP. [2005-2006; CC, CIS]
- d) ***Establish policies and guidelines for secure authentication of all devices attached to the campus network.*** [2005-2006; CIS, CC; requires portion of additional position].
 - e) ***Provide network and services access to University guest users.*** Establish a 'Guest' Domain to allow temporary managed access to campus network resources including the Internet and other services on the network that require authentication. At present, the ability to grant such access is limited. This project serves the needs of departments and individuals hosting workshops on campus, visiting lecturers, and vendors who require network access while on campus. [2005; CC]
 - f) ***Register all network-based services.*** All network-based services will be registered. Web servers and e-mail servers have been registered; the registration of FTP services is underway. The goal is to register all services by the end of 2005. [2005; CC]
 - g) ***Adopt and support effective practices for secure server management.*** Adopt industry-accepted guidelines for server management. Publicize and encourage employment of best practices. Once security policies and practices are well publicized, begin auditing all resources for compliance, offering assistance to sites that do not conform to the policies. [2004-2007; CC, CIS; requires portion of additional position]
 - h) ***Offer a training/certification program to ensure a minimal level of competence for all server administrators.***
 - i) The Microsoft training path is being extended to a second round of systems administrators and other IT professionals. This training covers the Windows XP and Server 2003 coursework as approved by Microsoft. It includes eight courses to be delivered on-campus by a certified Microsoft Training Professional. [2004-2005; CC, CIS]
 - ii) Explore strategies for offering Microsoft training to systems administrators in other divisions. [2005-2006; CC]
 - i) ***Develop additional strategies for virus threat management.***
 - i) Explore the possibility of restricting access to the network for computers that are not running current versions of the campus-provided anti-virus software. [2005; CC, CIS]
 - j) ***Support secure network transactions.*** IT has deployed a PKI infrastructure to support encrypted e-mail, SSL certificates, smart-card authentication, and encrypted file systems. Encourage systems administrators to use the PKI infrastructure to support secure network transactions. Kerberos is the primary cross-platform authentication method and templates are available for Solaris, Linux, and Mac OSX. Begin to investigate Kerberos relationships to non-IT supported systems such as those in the Department of Computer Science. [2004-2006; CC]
 - k) ***Require encrypted Oracle connections.*** All users connecting to the Oracle data warehouse will use an encrypted Oracle client to ensure all sensitive data is secure. [2005; CIS]
 - l) ***Continue deployment of internal firewalls.*** Provide protected zones within the University network that can be used to secure desktops and other resources from both external and internal threats. [2004-2007; CC, CIS]

- m) **Create a backup plan for all core servers.** Use networked storage for backup. However, the amount of data to be backed up may mean that backups will need to be stored daily on hard disks to meet time and network bandwidth restrictions – storage purchases will need to be sufficient to accommodate this need. Devise a method for storing archived backups off-site – either in other buildings on campus or, preferably, off-campus. [2004-2005; CC, CIS, LIB]
- n) **Develop a written network and computing security plan.** [2005; CC, VPIT]
- o) **Develop a written disaster recovery plan.** [2005-2006; all IT directors]

3) Become a Knowledge Center

The concept of a “Knowledge Center” will continue to evolve during the construction of the new facility. New services will be introduced in Getchell Library, and the revised Knowledge Center Web site will be in place before the new building is occupied. The Knowledge Center will allow enhanced integration of information technologies, learning technologies, and content in a variety of formats to enrich the student experience and faculty productivity.

- a) **Work with architects and consultants to finalize design development and construction plans for the new facility.** [2002-2007; LIB, TLT, CC]
- b) **Prepare legacy collections for incorporation into the Knowledge Center.**
 - i) Determine which materials will go into the open stacks. Process all materials that are not barcoded. [2002-2007; LIB]
 - ii) Create catalog records for all materials that will be housed in the Automated Storage and Retrieval System, including selected government publications. [2002-2007; LIB; requires two classified positions for collection preparation]
 - iii) Develop appropriate metadata for online discovery and physical or online retrieval of all Library-owned materials. Create online information to help people locate materials wherever they are housed. [Ongoing; LIB]
 - iv) Investigate options for online access to government publications, including ongoing participation in national efforts and local digitization, replacing as many print documents as possible with authorized electronic versions. [2005-2007; LIB]
- c) **Develop and expand the information and technology support services to be offered in the Knowledge Center.**
 - i) Plan the integration of the current computing help desk and reference desk services, which are to be merged into a single “information center.” [2002-2007; LIB]
 - ii) Plan for “roving” assistance throughout the Knowledge Center. [2006-2007; LIB]
 - iii) Hire a head of the Information Center to plan and coordinate new services. [2005; LIB; requires new position]
- d) **Improve off-site delivery of information services.** Enhance information delivery services by providing campus users with an alternative face-to-face information consultation service, sending librarians to meet with them in their location. [2005; LIB]
- e) **Design a Knowledge Center Web site to replace the current library Web site.** Coordinate design and development among staff in the Libraries, TLT, and Campus Computing who will be located in the Knowledge Center. [2005-2008; LIB]
 - i) Improve the quality of the student experience through embedding information resources in online instructional tools and resources. [2004-2007; LIB, TLT]

- ii) Improve the research infrastructure through the development of Web-based tools for knowledge development, dissemination, and discovery. In 2005, purchase and implement a suite of products from Syndetics Solutions, including book cover images, book reviews, summaries and annotations, first chapters, and author notes. These objects will be integrated into the library's online catalog, making it easier for users to locate the books that will be of most value to them. [2005; LIB]
- f) ***Review the organization of the University Libraries*** in light of changes to come with the Knowledge Center. Examine all library positions and plan for adjusting positions where appropriate. Identify gaps in skill sets and design a staff training program to prepare staff to support new services in the Knowledge Center. [2005-2007; LIB]
- g) ***Develop assessment tools for the blending of offerings of an electronic library of the 21st century and the services to be offered in the Knowledge Center.*** [2005; LIB]

4) Enhance campus Web services.

- a) ***Develop enhanced services for faculty and staff to use in Web site development.***
Deploy PHP/MySQL to enable Weblog applications and other custom database applications. Explore the value of Weblog technology as it relates to the University. Identify the role IT units will have in supporting Weblogs. [2005; TLT, CC, CIS, WEB, LIB]
- b) ***Develop a form generation application*** that allows users to generate secure Web forms to collect survey research data. Application has been tested and is ready for production. [2005-2006; WEB; requires ½ new position]
- c) ***Develop a secure database service.*** At this time, IT does not have the personnel or servers required to support the storage of sensitive data. There is a widespread need for this service to support research as well as institutional information. [2004-2006; CIS, WEB; requires ½ new position]
- d) ***Encourage colleges and departments to use centralized Web services*** rather than managing Web servers at the unit level. This eliminates unnecessary and costly duplication of services that needlessly complicates the user environment and compromises network security. [2003-2007; WEB]
- e) ***Create and implement guidelines for Web page design.*** [2005; WEB]
- f) ***Continue the simplification of content management*** by encouraging broader use of Macromedia Contribute. Expand departmental site redesign program from 20 sites per year to 30 per year using the established methodology for the design and deployment of template-based Web sites. [2005; WEB; requires new position]
- g) ***Build and maintain Web sites that are accessible to people with disabilities.***
Continue monitoring the applicability of Section 508 and ADA to the University's Web presence. Strengthen accessibility policy and training in this area. [2004-2006; WEB]

5) Improve productivity services for faculty and staff.

- a) ***Improve centralized UNIX-based e-mail services for faculty and staff.***
 - i) Create a fully redundant and robust e-mail service for current Equinox mail users. Migrate users to the new service. [2005; CIS]
 - ii) Enhance anti-spam services. Allow users to opt-in to the service and choose service parameters. [2005; CIS, CC]

- iii) Move all mailing lists from Equinox to a special-purpose server. [2005; CC]
 - b) ***Expand Microsoft Exchange services to additional users.*** MS Exchange is the system that has been selected for users who require shared calendaring, personal productivity tools, and collaboration tools that cannot be as readily supported on UNIX e-mail. The goal is to expand the availability of centrally provided MS Exchange services to support 3,000 users, making it unnecessary for departments to run their own Exchange mail servers. [2004-2006; CIS; additional funding required]
 - c) ***Evaluate campus licensing of Adobe Acrobat (full version).*** Most University desktops have a version of Adobe Acrobat installed. Forty percent of installations are Adobe Acrobat (full version), which is necessary for generating PDFs and for working with advanced forms. [2005; CC]
 - d) ***Ensure that faculty staff, and vendors can securely access computing and information services from off-campus.*** Access to computing resources from off-campus must be controlled due to security and licensing concerns. Simultaneously improve security and usability of remote access services.
 - i) Microsoft Terminal Services 2003 has been determined to be the preferred method for allowing remote secure access to the network. Proof of concept has been successful and production equipment will be deployed. [2005; CIS,CC]
 - ii) Investigate secure file access methods such as WebDAV over SSL, Web-based messaging over SSL connections, or any technology that makes access to resources easier for the user while minimizing internal support requirements. [2004-2005; CC]
- 6) Serve as a partner in creating a superior technology-assisted learning environment for students and faculty.**
- a) ***Increase students' access to computers.***
 - i) Increase the number of public workstations in the Libraries. [2005; Libraries]
 - ii) Increase the number of laptops with wireless cards available for checkout to students. [2004-2005; TLT]
 - iii) Work with Residential Life and Housing to establish two technical Resident Assistant positions to support computer use and the computer labs in the residence halls. [2005; VPIT, CC]
 - iv) Explore partnerships with Dell to encourage students to purchase standard configurations of laptops. [2004-2005; CC]
 - b) ***Recommend a strategy for "e-portfolio" development.*** [2005; TLT, CC, CIS, WEB]
 - c) ***Create a mechanism for Academic Faculty to submit grades electronically.*** [2005; CIS]
 - d) ***Develop guidelines for distributing IT funds for informational and instructional technology projects.*** [2005; TLT, VPIT]
 - e) ***Create a mechanism for Academic Faculty to submit grades electronically.*** [2005; CIS]
 - f) ***Increase support for faculty using WebCT (course management software).*** WebCT impacts over 650 courses/sections with 11,000-plus student accounts. The growth of online instruction has been exceptional over the past four years with no expected decline in growth for the near term. To meet demand for support for recent and

anticipated growth, additional staff will be needed. [2005-2006; TLT; **funding for one full-time administrative faculty position**]

- g) ***Create performance measures for the use of classroom technology and online learning.*** Evaluate how much the technology is being used and how effectively the technology is adopted. Work with faculty and provide them with data to be used in assessing classroom technology and online learning. [2004-2006; TLT]
- h) ***Expand support for classroom instructional technology.***
 - i) Update and/or replace classroom instructional equipment on a 3-to-5-year cycle, depending on type of equipment. Funding has been identified for life-cycle replacement of equipment in existing level-4 classrooms, level-5 classrooms and equipment in the pool for lower classroom levels. Identify a stable funding source to support equipment replacement in conference rooms and specialized labs. [2004-2006; TLT, VPIT]
 - ii) Work with faculty, students, university administrators, and Facilities Services to establish campus standards for instructional equipment in the classroom. [2005; TLT, VPIT]
 - iii) Finalize initiatives already underway to establish systems that will remotely monitor, troubleshoot, and administer classroom projectors and computers over the campus network. [2005-2006, TLT]
 - iv) Evaluate newer technologies for applicability to the University's teaching and learning processes. Examples: (a) annotation through electronic whiteboards or pen-tablet computers, (b) recording class sessions and posting on the Web through a streaming server, (c) haptic devices, (d) 3-D imaging, (e) immersive displays. [2005-2007; TLT]
 - v) Collect data to determine the effectiveness of instruction that is being given to faculty in the use of classroom equipment. Faculty increasingly use media-based teaching materials, which creates a greater need for training. The primary goal in training both faculty and students in classroom-based technologies is to instill a sense of self-sufficiency. [2005; TLT]
- i) ***Develop strategies for supporting student and faculty use of information in digital formats.***
 - i) Assist in making information literacy an integral part of the University of Nevada, Reno, experience, both at the undergraduate and graduate levels. Pilot an information literacy model in a "core" undergraduate class such as English 102. [2005; LIB]
 - ii) Identify information literacy outcomes for the undergraduate experience at the University. [2005; LIB]
 - iii) Develop an online course evaluation instrument to obtain student and faculty perceptions of the value of the library instructional program. [2005-2006; LIB]
 - iv) Develop a coordinated program of services to support students and faculty in using digital images and streaming media for instructional purposes. Integrate digital media elements into authored multimedia products for classroom as well as distance education applications. [2004-2008; TLT, LIB]
 - v) Design, develop, and support facilities where faculty, staff, and students can create digital multimedia projects. Planning is underway for a facility in the

Knowledge Center, which is to open in 2008. Expanded services will require additional permanent staffing. [2004-2008; TLT]

- vi) Determine the feasibility of expanding professional media production. IT receives requests to produce analog and digital media in support of instruction, research, and service. In some instances broadcast quality media must be locally produced to service commercial media markets. [2005; TLT]

7) Identify, acquire and deliver appropriate information resources to support teaching, learning, research, and outreach.

- a) ***Increase the materials budget by 10%.*** The library's materials budget has increased by no more than 5% in each of the last three years, and in one of those years, suffered a 5% rescission. The materials budget is eroding in relation to inflation. Scholarly journals are the heart of the library's collection, and journal inflation is advancing at a rate of approximately 9.5% per year. Savings and "deals" realized in the early days of electronic databases and journals are no longer available. Our ability simply to continue providing what was provided in the previous year is declining. [2005; LIB; **funding required**]
- b) ***Learn more about faculty interests in teaching and research, about the information faculty value, and how they use it.*** Use focus groups, examination of current faculty funding and publications, and other means. Adjust collection development policies in light of this information. [2004-2005; LIB]
- c) ***Monitor the cost-benefits of continuing to provide bibliographic databases, as better means of access evolve.*** [2004-2005; LIB]
- d) ***Make it easier to find and use information.***
 - i) Develop a comprehensive solution to enhance access to electronic resources, utilizing various tools including electronic resources management and reference linking systems. Hire a library technician for electronic resources management to assist in managing the reference linking system and enhancing record quality in the electronic resources management system. [2004-2007; LIB; **new position required**]
 - ii) Develop and implement tools to extract and generate information from library applications automatically, such as RSS feeds for new acquisitions and updates to electronic reserves. [2004-2005; LIB]
 - iii) Evaluate options for searching across databases and implement a solution. [2004-2005; LIB]
 - iv) Explore commercial information management solutions, develop applications, and employ other techniques to solve information access problems. [2004-2007; LIB]
- e) ***Promote the use of the Libraries' materials and information in digital formats in instruction.***
 - i) Hire an Online Course Support Specialist. This position will work with TLT staff, the Excellence in Teaching Program, the Computing Help Desk, academic faculty, and the Assessment Office to integrate electronic information resources and digital objects into courses. [2006; LIB; **new position required**]
 - ii) Librarians and instructional designers will collaborate to develop new communication channels with faculty. Examples: a) use WebCT workshops to

introduce instructional faculty to the online learning environment, b) make joint presentations to academic faculty who are contemplating use of WebCT, c) jointly prepare Web-based and paper-based literature describing services and resources available to teaching faculty. [2005; LIB, TLT]

- 8) **Serve as a partner in building a University information environment that provides secure access to accurate and timely institutional information.**
- a) ***Establish a means for collecting, storing, and accessing institutional digital records.*** The management of official digital records on campus is a challenge that requires collaboration among many organizational units. Apply information access and retrieval expertise to examining preservation, storage, and access to institutional data. Work with University administrators to develop a plan for electronic records management. [2004-2006; VPIT; 2 new positions required; see Resources Requested]
 - b) ***Establish goals and priorities for specific projects*** such as the President's State of the University address, recordings of special campus events, and digital photographs of the University. Determine scope, responsibilities, and choose storage mediums as appropriate for each category of material (e.g., external hard drives, networked storage, CDs, DVDs). [2004-2007 LIB, TLT, CIS, WEB]
 - c) ***Expand the scope of the Libraries' KnowledgeWorks and Digital Projects units to develop a comprehensive infrastructure that supports the lifecycle of faculty-generated digital information.***
 - i) Provide access to digital products of research and scholarly activities through hosting, managing, and preserving those products. Develop a suite of KnowledgeWorks services to manage digital objects and data for researchers and teaching faculty; draft policies, procedures, and a marketing plan. Example for 2005: make Seismological Laboratory shake table data available on the Web. [2004-2007; LIB]
 - ii) Investigate the desirability and practicality of developing an institutional repository for faculty publications and projects. [2005-2006; LIB]
 - d) ***Develop a strategy for implementing online forms for routine transactions such as travel and leave requests.*** [2004-2005; CIS].
 - e) ***Improve the functionality of the online campus directory to make it the authoritative source for directory information.*** Add the "general listings" section of the printed directory to the online directory. Permit corrections to the directory to be submitted online. Either eliminate the printed directory or enable production of all sections of the printed directory from the online database with limited editing. [2004-2005; TEL, CIS]
 - f) ***Create a campus digital-signage, media distribution system.*** Several digital signage projects are underway on campus, including a project with the Office of University Relations (Communications Department). While the Communications Department will control the content to be displayed on plasma monitors, there is a need for technical, production and operational support. The most effective and efficient way of distributing content is from a centralized point, across the campus network to the monitor sites. [2005; TLT]

9) Implement strategies to maximize faculty and staff use of technology while minimizing the need for user support.

- a) *Participate in central coordination of information technology training.* At present, staff in various University units perform information technology training. Participate in a task force on training that is being organized by the director of Human Resources. Define IT and Library roles and responsibilities for training. [2005-2006; VPIT, TLT, WEB, CC, LIB]
- b) *Explore the feasibility of developing a set of basic technical competencies for various categories of faculty and staff.* Work with Human Resources and with existing faculty and staff organizations to assess the general level of support for this initiative. Determine whether meeting a minimum skill level would be mandatory or optional. [2004-2006; CC, VPIT]

10) Support Research and Advanced Computing Applications.

- a) *Support the management of large datasets used in research.* The Libraries' DataWorks unit supports the management of large datasets and provides an advanced academic computing environment for research and instruction.
 - i) Currently, DataWorks provides a four terabyte redundant distributed storage system for large dataset storage. Storage will be expanded to accommodate research needs. [2005; LIB]
 - ii) To assure stable, ongoing service, the Library will add redundancy to key servers, to include Mapserver (ArcIMS and Metadata servers), SQL (including ArcSDE), and SharePoint. [2005-2006; LIB]
 - iii) To provide a dependable and robust data backup environment for DataWorks and other Library data resources, tape library systems will be upgraded and expanded. This procurement will support a multi-tiered back-up strategy based both on daily incremental backups and monthly full system backups (stored off-site). [2005; LIB]
- b) *Support advanced visualization, modeling, data analysis, and computer mathematics applications.* DataWorks provides a sophisticated thin client-server environment that allows users to run advanced applications at their workstations. DataWorks systems are currently supporting the research work of a number of faculty and graduate students. At least one additional graduate assistant is required to provide consultation to users regarding the use of these advanced applications. [2004-2007; LIB; **funding for one graduate assistant**]
- c) *Support collaboration via the Internet and Internet2.* Collaboration among researchers and collaboration for instructional purposes is becoming increasingly important in higher education.
- d) *Evaluate campus licensing of Adobe Acrobat (full version).* Most University desktops have a version of Adobe Acrobat installed. Forty percent of installations are Adobe Acrobat (full version), which is necessary for generating PDFs and for working with advanced forms. [2005; CC]
 - i) Assess the video conferencing and distance education technology, facilities, and support provided at southern and rural Nevada UNSOM sites. Generate a plan that ensures well-developed facilities, contemporary technologies, quality support, and high levels of program and system reliability. [2005-2007; TLT]

- ii) Adopt video compression standards (MPEG4\H.264) as campus standards for videoconferencing. [2005-2006; TLT]
- iii) Continue to support Access Grid Node (AGN) development on campus. Communicate to campus constituents about Access Grid Nodes and the role AGNs can play in research and instruction. [2004-2006; TLT]
- iv) Develop equipment and software standards for Web conferencing at the desktop. LiveMeeting, HorizonLive, and Webex are examples of software that will be considered. [2005; TLT, CC]
- v) Purchase and support collaboration software that meets the needs of faculty and administrators who need to share large documents with outside constituents. Continue to support Microsoft's SharePoint for those constituents who find it meets their needs. [2005; LIB, CC, CIS, TLT, WEB]
- vi) Develop a plan to expand the ways in which our video conference facilities are used. This may include producing videos to be incorporated into online curricula. Another use may be to record class sessions so they can be posted online or distributed via optical disc. [2005; TLT]
- e) ***Offer advanced consulting and information services for members of the campus community.*** Take an active role in the current campus initiative to support researchers. Be sure that appropriate constituents understand the services that IT and the Libraries are offering. [2004-2005; CC, LIB]

11) Maintain and enhance the campus network infrastructure.

The University of Nevada, Reno, is a network-centric campus. A functional network that supports integration of data, voice, and video technologies is the backbone on which all information services are built. Network bandwidth and speed must continually be increased to accommodate increased demand and new initiatives such as Access Grid Nodes, Internet2 advanced research projects, digital video, and telephony. It is the goal to bring the network to a level that is redundant in the core, redundant to the distribution layer, with gigabit uplinks to all appropriate buildings.

- a) ***Upgrade telecommunications rooms.*** Telecommunications rooms in all buildings on campus need to be brought to minimum level of standards to support effective network services. According to a Western Telecommunication Consulting survey in 2001, it was estimated that it will cost approximately \$666,000 to upgrade or replace substandard telecommunications rooms. IT plans to build and upgrade telecommunications rooms over a six-year period (2002-2007), to bring all telecommunications rooms up to levels that support telephony and other expanded network needs. [2002-2007; VPIT; additional funding required, but should be covered by comprehensive campus telephony project]
 - i) Funding in the amount of \$215,000 is required to upgrade the network aggregation points and fiber end point rooms for a new campus telephone system. [2005-2006; TEL; additional funding required, but should be covered by comprehensive campus telephony project]
 - ii) Create a policy requiring that appropriate telecommunications rooms and pathways be constructed whenever building renovations are planned. Telecommunications rooms must be a fundamental priority. Building networks

- are at risk without a permanent suitable location for supporting the data/voice wiring and equipment. [2005; VPIT]
- b) **Replace outdated network wiring and electronics.**
 - i) Replace core network routing hardware to support lossless failover, internal firewall services between subnets and 10 Gigabit links to data centers. [2005; CIS]
 - ii) Relocate core network functions to a generator/UPS power protected room with restricted access. [2005; CIS]
 - c) **Expand the capacity and redundancy of the fiber network.** IT recently purchased the equipment needed to install and terminate all indoor and outdoor fiber plants. This will allow repair or installation of fiber optic cable without long lead times.
 - i) Upgrade the fiber optic backbone to provide single-mode interconnections that can support 10 Gigabit Ethernet links between all network aggregation points. [2004-2007; CIS]
 - ii) Add network redundancy. This includes upgrading the links with System Computing Services to accommodate the new OC48 link to CENIC and SCS's location of a second switch outside of the SCS Computing Center building. IT will activate a second core to provide core routing and link redundancy. Scheduled for summer 2005. [2005; CIS]
 - iii) Upgrade the fiber link from the Medical complex to the SCS Computing Center. [2005; CIS]
 - iv) Activate a second link to NevadaNet for redundancy. [2005; CIS]
 - d) **Complete installation of wireless network services.** Implementation of wireless services began in 2003. Complete the installation of wireless networks in all scheduled buildings. [2003-2005; CIS, CC]
 - e) **Explore solutions for improving off-site networking.** Examine strategies for extending networking to the Manogue property and providing services to buildings on Evans Avenue. [2004-2005; CIS]
 - f) **Improve network performance and operational responsiveness.**
 - i) Improve centralized logging and analysis of network monitoring and auditing data related to network performance. Improving analysis of this data requires robust database services and use of high-performance storage (SAN). Development of appropriate backup strategies for offline storage and retention of network monitoring data is also essential. [2004-2005; CC, CIS]
 - ii) Expand real-time network monitoring. Evaluate the concept of placing network computers around campus in critical locations to gather applications performance metrics such as latency, throughput, and loss. [2005; CIS]
 - g) **Create private VLANs for appropriate network traffic.** Create a VLAN for the building security systems and for the heat plant network. Migrate Metasys and Perimeter Security devices to protected networks. [2004-2005; CIS]
 - h) **Begin to provide DHCP services** to allow for easier desktop management and to use IP address space more efficiently. This project requires considerable programming and depends on filling the internal IT programming position. [2005-2006; CIS, CC]
 - i) **Convert services formerly provided via analog video to digital video.** The 20 year-old analog broadband network is failing. The digital network will replace the broadband network as the means for delivering video services. Phase one is to

- conduct a pilot project for distributing local commercial cable television (Charter Communications) over the digital fiber network, with the goal of becoming operational by the start of fall semester, 2005. [2005-2007; CIS, TLT]
- j) ***Develop a structure to support increased use of streaming services.*** A working group from CIS, CC, and TLT will address the technical issues surrounding streaming services. Identify scaled down applications to test the viability of various models. [2005-2007; CIS, TLT, CC]
 - k) ***Explore the use of Wimax technology*** for its potential to deliver broadband connectivity to areas of northern Nevada that have no access to broadband. WiMAX is a standards-based wireless technology that provides high-throughput broadband connections over long distances. [2005-2006; TLT, CIS]

12) Modernize voice (telephone) services on campus.

- a) ***Replace the current Centrex telephone switch and the diverse and aging telephone equipment on campus with a modern unified telephone/voice mail system.***
 - i) Develop a business plan to finance a new telephone system. Work with Western Telecommunication Consultants, Inc. to negotiate a final agreement with one of two telephone equipment providers remaining in the RFI process. [2005; TEL; additional funding required, but should be covered by comprehensive campus telephony project] Develop a detailed implementation plan for the new telephone system. [2005; TEL]
 - ii) Create a new position in Telecom Services to oversee the voice services project and manage the new PBX and related services. The position will require campus or corporate PBX experience, with the candidate being well grounded in traditional telephony as well being open to emerging telephony technology. [2005; TEL, VPIT; additional funding required, but should be covered by comprehensive campus telephony project]
- b) ***Complete the 911 emergency database update project for 4,000+ telephone lines.*** [2003-2005; TEL with Facilities and SBC]
- c) ***Implement a new call accounting package for Centrex services.*** Eliminate use of the SBC magnetic tape by the end of 2005. [2004-2005; TEL, CIS]
- d) ***Develop a method for ensuring audit control for long distance bills.*** [2005; TEL, CIS]
- e) ***Begin experimentation with voice over Internet protocol (VoIP).*** The University's most recent accreditation report suggests that faculty should be able to place calls from classrooms to request technical assistance. Explore the feasibility of using VoIP telephony for this purpose. [2005-2006; CIS, TEL, TLT]

13) Assess, promote, preserve, and provide access to unique and regionally oriented materials; identify, organize and customize the delivery of local and regional information resources.

- a) ***Update collection policies as appropriate and reassess collections in terms of revised policies.*** [2005; LIB]
 - i) Develop a comprehensive vision for Basque collection development, assessment, and management in order to provide effective access to unique materials for local

- and international researchers. Compile a detailed inventory of Basque archival materials. [2004-2005; LIB]
- ii) Analyze collections for gaps in regionally oriented materials and create a plan for enhancing collections in these subjects. [2005-2006; LIB]
- iii) Produce a collection-level inventory of unique and regionally oriented materials that are not represented in the public online catalog. [2005; LIB]
- b) ***Identify unique materials that are at risk of deterioration.***
 - i) Develop a preservation plan for selected materials. [2005-2006; LIB]
 - ii) Investigate and make recommendations about preservation metadata for the Library's "born digital" collections. [2005; LIB]
 - iii) Seek outside funding for preservation projects. Submit grant proposals for preservation of Basque and Special Collections materials. [2005; LIB]
 - iv) Investigate partnerships and grant funding for digitizing unique and important materials. [2005-2007; LIB]
- c) ***Determine appropriate levels of access for uncataloged materials in Special Collections and the Basque Library and Nevada materials in the Business and Government Information Center.***
 - i) Where appropriate, provide collection-level access to these materials through the online public access catalog. [2005-2006; LIB]
 - ii) Provide more granular access to these collections through finding aids, local databases, and Web exhibits. [2005-2007; LIB]
 - iii) Investigate strategies for creating access to the Libraries' backlog of uncataloged materials in foreign languages. Hire a Knowledge Access Librarian to catalog materials (primarily Spanish language). [2005; LIB; **new position required**]
- d) ***Provide organized access to Web-based resources of regional interest.***
 - i) Develop a bioregional Web site to support the Academy for the Environment and integrate it with existing regional collections, such as the Keck digital maps collection. [2005; LIB]
 - ii) Develop a Web site to highlight and present the University's Tahoe-related research, publications, and outreach activities as well as library materials related to Lake Tahoe. [2004-2005; LIB]

14) Establish policies and practices in support of the University's information technology goals and values.

- a) ***Monitor, interpret, and implement, as required, state, and federal information policies.***
 - i) Assess a wide variety of policy promulgations to assure appropriate application to and implementation within the university environment. Recent examples of federal legislation and resulting regulatory directives include compliance with the various provisions of the Health Insurance Portability & Accountability Act (HIPAA), implications of IT security related to the USA PATRIOT Act, and the Department of Justice's new and enhanced requirements regarding the tracking of international students. Complex information infrastructure security directives are also anticipated in the weeks, months, and years ahead. [Ongoing; VPIT]
 - ii) Continually review existing policies for acceptable use of campus information systems in light of a growing number of areas impacted by a flurry of federal laws

- and regulations, i.e. security, privacy, anonymity, intellectual property. Ubiquity of IT is increasing the possibility of institutional liability. [Ongoing; VPIT]
- iii) Assess, on an ongoing basis, future use of information systems on campus in light of national and state law. Implementations of Web-based services and secure payments require substantial policy development as do a myriad of other activities such as faculty submission of grades online. [Ongoing; VPIT]
 - b) ***Participate in campus efforts to promote understanding of scholarly communication, copyright and intellectual property issues.***
 - i) Work with the Excellence in Teaching Program to develop a series of campus-wide programs relating to scholarly communication. [2005; TLT, LIB]
 - ii) Find opportunities to participate in discussions of plagiarism, copyright, and other intellectual property in appropriate forums. [2005-2007; TLT, LIB]

15) Improve the Information Technology division's ability to serve the University's needs effectively.

- a) ***Develop a career path for administrative faculty in IT.*** A new hire with minimal experience might start at Administrative Faculty Level 1. As experience and knowledge is gained, and with exemplary performance, qualified staff should be able to move through Administrative Faculty Levels 2 and 3. [2004-2007; VPIT]
- b) ***Evaluate the division's current and future space requirements.***
- c) Expand the number of available offices to accommodate current needs and anticipated growth of IT staff. Examine possibilities for expanding in Cain Hall as current occupants move to other buildings over the next few years. [2004-2007; VPIT]
- d) ***Complete the development of well-equipped IT server rooms.*** Primary IT server rooms are located in Getchell Library and Cain Hall. The goal is to distribute IT servers among multiple server rooms on campus for convenient access as well as to provide redundancy, minimizing service disruption in the event of a disaster in any one building.
 - i) Complete upgrades to the Getchell Library and Cain Hall server rooms to meet standards for electrical service, temperature and humidity control, and physical security (locks, alarm). [2003-2005; CC, CIS]
 - ii) Develop a plan to migrate the mini-server rooms to the Health & Safety building with its dedicated high-capacity cooling. [2005; CIS, CC]
- e) ***Develop a model for managing IT projects that includes comprehensive planning, testing, and signoff by stakeholders, organized implementation, and follow-up.*** [2005; VPIT]
- f) ***Consider establishing the position of IT Acquisitions/Inventory Coordinator*** to participate in negotiations and auditing of all software and hardware agreements, to assist departments with managing software and computing equipment inventory, to review IT-related purchase requests for compliance with standards, to assist users with IT-related purchases, and to explore and recommend a process for inventory control. Hundreds of thousands of dollars are spent University-wide each year on computing-related purchases. Institution-wide savings can be realized by improving the information available to purchasers of computing equipment and software and/or providing more rigorous oversight of these acquisitions. The savings are not only in

- purchase dollars, but also in the reduced cost of ongoing support. [2005; VPIT; requires additional position]
- i) Develop a method for tracking and maintaining records for all hardware and software purchases and contracts in IT. [2005; VPIT]
 - ii) Determine the viability of RFID as a means for inventory control. [2005; CIS]
- g) ***Assess the strengths and shortcomings of IT services.***
- i) Review and modify the performance indicators for every IT unit. Compile and publish all measures that are currently available. Collect additional information. [2005; all IT managers]
 - ii) Undertake a broad-based, campus wide study of perceived strengths and shortcomings of IT service. [2005-2006; all IT units]

Resources Requested – FY 2005-2006

Staffing Priorities (in order)

- 1) 2005-2006: **Information Center Manager**; responsible for the development of responsive and holistic on-site and remote reference services, coordinates with manager of the Computing Help Desk to integrate service points, directs public services staff training, oversees development of a new Knowledge Center Web site.
 - i) Librarian II or III
- 2) 2005-2006: **Online Course Support Specialist**; responsible for optimizing access to electronic materials for online courses, scanning services, distance education support. Works closely with TLT instructional designers.
 - i) Librarian II (entry level)
- 3) 2005-2006: **Library Assistant for collection preparation** (before the move to the Knowledge Center) and ASRS support and scanning for desktop delivery and digital projects (after the move).
 - i) Library Assistant II (class 23-01)
- 4) 2005-2006: **Library technician for electronic resources** management; to assist in managing the reference linking system and enhancing record quality in the electronic resources management system.
 - i) Library Technician I (0.5 FTE, class 27-01)
- 5) 2005-2006: **Administrative Faculty in Support of WebCT**; to meet the demand for rapidly growing instructional technology applications.
 - i) Administrative Faculty II
- 6) 2005-2006: **Library Assistant for collection preparation** (before the move to the Knowledge Center) and ASRS support and scanning for desktop delivery and digital projects (after the move).
 - i) Library Assistant III (class 25-01)
- 7) 2005-2006: **Knowledge Access Librarian**; responsible for cataloging foreign language materials; Spanish required.
 - i) Librarian II (entry level)
- 8) 2005-2006: **Graduate assistant for KnowledgeWorks**, to manage large data sets and develop data management tools.
 - i) **Graduate Assistant (.5 FTE) \$6,000**

- 9) 2005-2006: **Library Assistant for collection preparation** (before the move to the Knowledge Center) and ASRS support and scanning for desktop delivery and digital projects (after the move).
 - i) Library Assistant II (class 23-01)
- 10) 2005-2006: **Web Developer Position**; under campus Webmaster, will develop departmental Web applications and enhancements to university-wide applications.
 - i) Administrative Faculty II [See: (4)b,c]
- 11) 2005-2006: **Web Designer Position**; under campus Webmaster, will design and build departmental Web sites and enhancements to university-wide web sites.
 - i) Administrative Faculty II, See: (4)f]
- 12) 2007-2008: **Facility Manager, Knowledge Center**; responsible for planning and carrying out building safety and security functions; oversee building management.
 - i) Administrative Faculty II

Operating Priorities

- 1) **Increase the library materials budget by a minimum of 10%. [ESSENTIAL]**
- 2) More rapid expansion of standard, supported platform, \$200,000 (2)a)i]
- 3) Video over IP, Phase II, \$100,000 (video, including cable TV to campus classrooms over campus fiber optic network)

Institutional Staffing Priorities (Initiatives anticipated to be in other plans that will require IT/Libraries support)

- 2005-2007: **Electronic Records Manager and Support Staff Position**; to develop and implement a campus-wide plan for managing, preserving, and providing appropriate access to institutional records, including the formulation of a campus records retention schedule.
 - i) Administrative Faculty II
 - ii) Classified Staff Support
- 2005-2007: **Redfield IT/Library Technician**; to support for the Redfield Campus (degree of support required is unknown, but a single position at a remote location will be insufficient)
 - i) AV Tech II

**Information Technology/KUNR FM
Strategic Plan 2004 – 2008
Revised April 2005**

Executive Summary

The next few years will focus on research and planning activities to improve fundraising efforts, hire key personnel, update, and refurbish broadcast equipment at the rural transmitter sites, and upgrade the KUNR studio and office facilities. (A new main transmitter will be installed on McClellan Peak soon to improve the quality of the signal that is sent to the rural transmitter sites.) KUNR has broadcast the current program line-up for many years and it is necessary to assess how effective these shows are today. New marketing strategies and promotional materials will be designed to support and promote any changes that are made.

The strategic plan contains plenty of time to research and assess possible changes so that there is confidence in their success once they are implemented. Too often, the station has initiated hasty adjustments that then have had to be revised. This causes confusion for listeners as well as staff. After proper review of research studies and consultant recommendations, KUNR will build and present the case for revising program content, increasing the number of members and membership building activities, and marketing strategies to announce those changes.

A careful scrutiny of major KUNR activities is crucial because of the erosion of public radio listeners in our market. Satellite radio will continue to be a threat as more and more people acquire receivers to tune into these channels. Capital Public Radio in Sacramento is aggressively appealing to our public radio listeners and is mailing direct marketing campaigns requesting membership and support. The initiatives outlined below will address the station's competition and improve the station's efficiency and relevance for delivering program content as well as administrative support.

What We Do at KUNR FM

Mission Statement

KUNR is a non-commercial, listener-sponsored, public radio station providing northern Nevada and northeastern California with a stimulating and diverse mix of music, news, public affairs, and cultural programming. KUNR serves its communities with thought-provoking discussion and perspectives that contribute to an informed citizenry in a way heard nowhere else in the region.

Summary of the Services KUNR Provides

- Broadcast NPR and local news, weather and music programming 24 hours a day, every day of the year
- Liaison between the arts/cultural community and the listeners throughout northern Nevada and northeastern California
- Secondary Emergency Alert System (EAS) resource
- Self-supporting through a variety of fundraising techniques, including Spring and Fall Membership drives

Strategic Initiatives

1) Improve Fundraising Effectiveness

The number of nonprofits continues to increase and there is more competition for every donor's contribution. It is paramount that fundraising be conducted professionally and efficiently with professional pitch announcements, plus software and accounting procedures to support accurate measurements.

- a) Work with professional fundraising consultants to improve the effectiveness of membership campaigns. (2005)
- b) Research fundraising methods at other University licensed public radio stations that are similar in size. (2004 – 2006)
- c) Investigate options for improved online fundraising solicitations, including options to capture increased data by volunteers during membership campaigns. (2005 – 2006)
- d) Upgrade current data systems (Raiser's Edge) to accommodate customized reports, process data faster and sort information into additional queries. (2005 - 2006)
- e) Determine major donors who have capacity to make a contribution of \$1,000 or more per year to the station (2005 – 2008)
- f) Enhance fundraising training for underwriting/development staff (2004 – 2008)

2) Determine and hire essential staff positions

The KUNR staff is relatively small (nine full-time employees, eight part-time employees) and everyone wears a variety of "hats." The perspective of each staff member is influenced by the amount of duties s/he now performs. Therefore, it is vital to have an outside entity give guidance to staffing improvements.

- a) Review current clerical support positions and duties with a consultant to determine the level of effective support. (2005 – 2006)
- b) Review current staff positions and structure of membership campaign activities with a consultant to determine if additional positions are needed. (2005 -2006)
- c) Review current underwriting staff positions with a consultant to determine further development expansion needs. (2005 -2006)
- d) Investigate the option to hire a part time station engineer. (2005 – 2006)
- e) Continue the review of all current positions and assignments. (2005 – 2006)

3) Improve the delivery of the KUNR broadcast to transmitter areas

Many of the rural transmitter sites were established nearly a decade ago and equipment is wearing out. KUNR owns the equipment at some sites and is responsible for signal quality at others. However, the listener does not understand or care about these distinctions. They hold the station responsible for maintaining the quality broadcast of programming. Not all communities are able to find the resources to upgrade and repair their sites even if they are responsible. KUNR must assume the responsibility of maintaining or overseeing the maintenance of the equipment at these sites.

- a) Assess the functionality of the equipment (antenna, transmitter, co-ax cable etc.) at Battle Mountain, Eureka, Hawthorne, Incline Village, Lovelock, Verdi, Winnemucca, and Yerington. (2005 – 2007)
- b) Develop a plan to increase the level of power and sustainability of affiliate station KNCC, in Elko. (2005 – 2006)
- c) Install a new KUNR transmitter on McClellan Peak. (2005)

4) Continue to upgrade the on-air and administrative office facilities

The KUNR offices and studios have been neglected and need serious maintenance. In addition to new carpet, paint and furniture, the station must address the changes in technology and software.

- a) Remodel the former news room (room 119) into the main KUNR on-air studio. (2005)
- b) Upgrade the equipment and remodel the current Studio B. (2005)
- c) Determine the need for additional software programs to enhance the news department. (2005)

5) Develop means to assess our current KUNR program line-up and determine future effective program content.

The station has maintained the current program line-up for several years. Many public radio stations are switching formats or increasing NPR content. KUNR needs to assess the timeliness of its programs and assess their interest to the majority of KUNR listeners. (What do listeners really want to hear?)

- a) Work with a public radio marketing team to conduct listener research with regards to satisfaction with current shows. (2005 – 2006)

- b) Hire a consultant to review all program content and make suggestions for future programming. (2005 -2006)
- c) Meet with management of at least three public radio stations (similar in size to KUNR) to assess their current program content and strategies for future programming. (2005 – 2007)

6) Improve KUNR's visual image and upgrade marketing materials.

KUNR's visual image has not been updated for many years. A visual branding of the station is key to influencing listeners that the station is timely, innovative, and progressive.

- a) Work with a professional graphic artist to design a new station logo. (2005)
- b) Design a new underwriting media kit and other station marketing materials such as pamphlets, bumper stickers, brochures. (2005 – 2006)
- c) Trade with newspapers, magazines, cultural organizations to actively promote the station in their publications. (2005 – 2008)
- d) Continue to be the media sponsor of community cultural events such as the Nevada Chamber Music Festival and the Performing Arts Series. (2005 – 2008)
- e) Continue to maintain a fresh look on the KUNR website and increase the level of content. (2005 -2008)

APPENDICES

- A. Process for Planning and Resource Allocation
- B. Environmental Context for IT
 - a. Special section on potential replacement of administrative systems
- C. Environmental Context for University Libraries
 - a. Declining Power of the Materials Budget and Staffing in Much Larger Facility
 - b. Description of the Knowledge Center
- D. Summary of Accomplishments in 2004 in IT
- E. Summary of Accomplishments in 2004 in the University Libraries

IT Division Status – April 2005 (Appendix A)

In 1997, the Northwest Association accrediting report expressed “general and serious concern over computer technology” at the University of Nevada, Reno, noting that, “faculty and staff in most parts of the University were largely left on their own for years to acquire needed hardware and software and that instruction, research, and other efforts have suffered.” A parallel concern was “the lack of technical support for computer technology.” Since that time, the University administration has fundamentally changed the prevailing institutional philosophy regarding information technology. In funding IT in a meaningful way, a conscious decision has been made to treat IT as a strategic asset rather than simply a cost to be avoided or controlled. Fundamental to this change in philosophy was the provision of IT with a budget that could be used to engage in realistic planning and to be more efficient by taking advantage of working towards being a true network-centric operation through more common software architectures. Such an approach is yielding more effective planning, performance, and operations. Spanning applications, operations, and information infrastructures is also the key to reducing IT complexity.

Even though this funding base only emerged in August 2003, detailed planning allowed IT to put the new funding to work. Much of the early work involved upgrading the campus network backbone; progress that is more conspicuous has been seen as the requisite new staff positions have been filled.

While the IT funding and institutional direction in IT can only be deemed dramatic, it is important to keep in mind that IT is digging out of a very large hole that has permitted long-standing wasteful and overly decentralized IT coordination. We also know, as the President has pointed out, that additional IT funding will be needed simply to support current operations, let alone, rising information technology demands and opportunities.

The Division’s highest priorities are pointed out elsewhere, but it is important to note that inadequate levels of IT support will continue to exist at spots throughout the campus due to the lack of systems support personnel. While we are hoping to mitigate some of these shortfalls through technology solutions described elsewhere, additional personnel will be needed and will continue to be a high priority. This priority will be a challenge as adoption of IT in almost every facet of the University’s enterprise continues to grow at a high rate. Both of these shortfalls are nowhere more evident than in support of the rapidly growing instructional and IT support needs of the University’s School of Medicine in Reno and in Las Vegas.

ENVIRONMENTAL CONTEXT for IT (Appendix B)

The environmental context for IT in higher education is framed in this section along three major themes: aging legacy systems that lack interoperability at a time when modern, mature integrated systems are available, a national IT concern over the challenges posed by securing information systems and networks and demands to comply with numerous laws, regulations, and directives to ensure appropriate levels of security; and the opportunities available through embracing instructional technology across the curriculum.

Legacy Administrative Systems

The one area where the University of Nevada, Reno differs dramatically from its peers in a broad environmental context of institutions of higher education is in the area of enterprise administrative systems. Administrative computing systems on which the University of Nevada, Reno relies presents numerous points of failure, ineffectiveness, as well as missed opportunities. Modern higher education administrative systems were developed to perform much more than transaction-based operations. Their various applications are tightly integrated to provide insight into the operations across the enterprise and to be critical tools to assist in the planning efforts of the institution. Typically, primary components of such systems consist of modules covering human resources, financial, and student information. This integrated approach to administrative functions is essential in an age in which strategic planning has placed demands on a solid, usable source of data. These data are required to be used in institutional assessment not only by the institution itself, but also by a variety of entities ranging from accrediting bodies to state government.

Modern administrative systems also provide the capability to deal with electronic commerce and to offer business transactions and processes in a network-centric environment. This includes a centrally coordinated uniform interface that provides a wide variety of integrated online Web services for such functions as admissions and payment of application fees; payment of tuition and student bills; purchase of books, computers, software, etc., online; business-to-business electronic procurement; hazardous materials tracking; electronic processing of accounts payable invoices; EFT; direct deposit of payroll and travel reimbursement; multifaceted one-card systems; electronic reporting of grades and ordering of transcripts; and records management and imaging to move to a less paper-intensive campus environment.

As important as these functions are to a modern campus, perhaps the most dynamic advances are occurring in the area of student services. Mature, integrated higher education administrative systems tightly link student information with the institution's strategic academic and economic objectives in areas such as student retention, recruitment, and graduation rates; enrollment management; resource management; revenue generation; academic planning; marketing; as well as performance assessment at the student and institutional level.

Student oriented Web services also are readily available and provide numerous opportunities for self-help interactions and communications in newer, integrated systems. Routine services are easier and made available electronically at any time and at any place without intermediation of student services staff.

Due to the centralization of core administrative software at System Computing Services (SCS) of the University and Community College System of Nevada, the University of Nevada, Reno is in a peculiar position regarding administrative computing. The University is one of only a handful of major state universities in the nation that does not have its own campus administrative systems or have access to a modern integrated, centralized system based on relational database technology. This lack of capability is a major impediment to creating a responsive administrative IT service environment on campus.

Numerous efforts have been made to change the status quo. Consultants have come and gone and their recommendations have been dismissed due to resistance to change as well as the initial cost of replacement of increasingly fragile systems. SCS's existing systems, operated and maintained for system-wide use, are rigid, have a steep learning curve, lack essential functions, are stand alone and defy critical integration. Clearly, these systems put the University at an increasingly competitive disadvantage.

Through the building of campus data warehouses for each of these functional areas, the University of Nevada, Reno has blunted the green screen plague of these aging, inflexible systems. However, there is a limit to what the University can do within a data warehouse environment to overcome administrative systems that lack the basic, let alone advanced, capabilities of modern enterprise systems installed at peer institutions. Moreover, the present funding of administrative systems at System Computing Services also means that funds that might come to the campus will always be hard to obtain for local administrative systems initiatives due to the belief that funding the System's needs for administrative computing are satisfied via the mainframe operations at SCS. At present, the University is working through and around SCS for administrative computing; finesse is the main tactic, but the age and inflexibility of the legacy systems are making this more difficult with each passing year.

Shortfall of SCS Administrative Systems

The organizational issue is in many respects secondary to the patchwork of SCS-operated systems, purchased on the cheap without a clearly defined strategic vision. The cost to rectify this situation on a statewide basis has traditionally been considered prohibitive. As a result, incremental efforts at upgrading existing systems have been undertaken and the commitment to existing vendors with a decreasing user base is almost unshakeable. Moreover, internal, exhaustive efforts to write code to make these systems functional is extraordinarily expensive and can, in no way, compensate for the dramatic advantages offered by modern integrated administrative systems.

The legacy nature of the administrative systems requires massive mainframe architecture and there is no opportunity to scale down the architecture to reduce costs. The current SCS administrative systems and vendors are: Student Information System (SIS) [Informs], Financial (Advantage) [American Management Systems], and Human Resources (HR) [Integral]. These are *old* systems, from the age of green screens and before. These three vendors are in various stages of moving to new versions that are "Web-enabled." Regardless, this is too little too late in light of the mature integrated applications that now dominate the higher education administrative

software market and does not solve the basic functionality shortfalls of such disparate and aging systems.

Today's Higher Education Administrative Software Marketplace

Modern higher education administrative software reached relative maturity by the end of the century. Leading systems today incorporate “best-practice” solutions in the major business modules (human resources, financial reporting, and student administration). The earlier tendency to purchase best-of-breed functional units from different vendors has given way to the purchase of highly integrated systems from such firms as Oracle/PeopleSoft or SunGard SCT (Banner). These systems are several generations ahead of what SCS is currently using in that the modern systems embed a solid enterprise-wide strategy through a robust database that supports open standards and a plethora of development tools. Modern higher education administrative software systems have fleshed out their fundamental modules and are actively partnering with other established vendors to provide integrated solutions to enhance Web services such as electronic purchasing, portals, and course management software such as those represented by Web-CT.

In short, advances in administrative computing support and Web services will continue to be difficult to accomplish at the University. We trail peer institutions and will so as long as the NSHE maintains its present course. Individual software components for discrete administrative functions are being added on a standalone basis on all of the campuses throughout the System.

Security and Compliance

Increasingly, the environmental context for IT on campus grows closer to the broader international context of IT, regardless of sector. Beyond basic funding, the overriding national concern across all manner of IT operations is the present and emerging directives, regulations, and statutory compliance issues. Ten years ago, when IT was not recognized as being so pervasive in everyday life, these issues were all but non-existent in national political discourse and were of far less concern to IT operations. Prior to the turn of the century, however, the seeds of discord were planted in such areas as fundamental economic/property rights in a digital era and individual privacy concerns. These initial concerns grew rapidly in the post-9/11 era when matters of national security kindled latent concerns about privacy, and corporate misdeeds brought increased national attention to digital recordkeeping.

Consequently, the environmental context in which University IT functions must now deal relates directly to the regulation of unwanted commercial email, elimination of any extraneous uses of Social Security Numbers (SSNs) as primary identifiers, illegitimate uses of peer-to-peer file sharing technologies, intellectual property rights, privacy, and an assortment of federal legislation and regulatory matters that are only partially encompassed in the U.S.A. PATRIOT Act, the Gramm-Leach-Bliley Act of 1999 (GLB), the Health Insurance Portability and Accountability Act of 1996 (HIPAA), the Student and Exchange Visitors Information System (SEVIS), and the Digital Millennium Copyright Act. These and additional directives, combined with growing U.S. government sentiment that higher education computer activities are inherently insecure, all need to be evaluated in light of the principles of academic freedom fundamental to the University environment. Ultimately, these issues, in tandem with persistent and increasingly virulent outside attacks on University networks and systems require that the University have its IT infrastructure as secure as possible.

Instructional Technology Adoption

Another area of national concern and one that we, in IT, recognize as being of increasing importance to the University of Nevada, Reno is the growth of information technology to enhance the instructional experience. Nationally, and even locally, integration of IT into classroom and extra-classroom activities has reached critical mass. This environment is undergoing constant change that is supporting new pedagogical approaches and creating new forms of learning communities. Moreover, student enthusiasm to access educational opportunities at a place and time of their choosing is unmistakable.

For faculty, this means retooling, but it also means that faculty can be more effective through a customized and flexible learning environment to meet the needs of increasingly diverse student groups. These changes all demand critical evaluation from academic affairs on the campus. To succeed, such changes require ongoing investment in enabling services that include tools and support staff capable of facilitating the development of courses as well as numerous and well-maintained “smart classrooms.”

Environmental Context for the University Libraries (Appendix C)

The future of the library is that there is no library; the functions that the library performs have been blown up and are scattered throughout the universe ... In [the] aftermath, however, the possibilities are greater, not fewer. But it is increasingly difficult to innovate within the status quo.¹

Getting to the “Next Level”

The University Libraries’ strategic planning takes place in a rapidly changing and complex information technology environment that has dramatically altered library users’ expectations and information-seeking behavior. During the remaining years of the University’s strategic planning cycle, the University Libraries, Teaching and Learning Technologies (TLT), and Campus Computing will be evolving into the Mathewson-IGT Knowledge Center, a physical manifestation of the Information Technology (IT) organizational structure at the University of Nevada, Reno. During 2008, a new building will be occupied, containing a suite of new on-site services. Simultaneously, the staff that comprises the various areas within the Information Technology division will be working towards a Knowledge Center Web, a sophisticated information service designed to deliver customized content and services of high value to the campus community in their residence hall rooms, homes, offices, and laboratories.

While the Knowledge Center is important and exciting, it does not, in itself, bring the University Libraries to the “next level,” on par with the institutions to which the University aspires. Only additional staff and increased funding for information resources will get us to that level. Table 1 shows the average for important measures for the UPC’s selected eight next-level institutions, compared with the value for each measure at Nevada. We fall short in the most critical areas. The University Libraries have only about one-third of the staff of these institutions, and spend only about one-half what the other institutions spend on materials.

2002-2003	Next-level average	Nevada	Percent of next-level average
Volumes added	80,723	25,922	32%
Volume increase	60,983	22,206	36%
Total volumes	3,007,502	1,105,147	37%
Government Documents	354,131	1,357,804	383%
Computer files (monographs)	7,127	3,519	49%
Mss. & archival materials (linear feet)	19,055	8,389	44%
Maps	161,913	147,865	91%
Graphic Materials	419,103	256,483	61%
Audio materials	28,039	46,188	165%

¹ Outlook 2004: Issues in the information marketplace. (2003, December 19). *InfoAboutInfo Briefing*, 6(32), 10. [Outsell, Inc.].

Video materials	18,033	16,220	90%
Monograph expenditures (all formats)	\$1,888,650	\$932,801	49%
Serials & database expenditures (all formats)	\$5,315,421	\$2,939,719	55%
Expenditures for other materials **	\$267,272	\$74,032	28%
Miscellaneous expenditures PPP	\$323,193	\$176,880	55%
Binding expenditure	\$159,141	\$18,433	12%
Total materials expenditures	\$7,794,535	\$4,141,828	53%
Electronic Resources (serials + monographs)	\$2,131,685	\$1,892,194	89%
Percentage of budget for electronic resources	28%	46%	
Other operating expenditures	\$1,996,356	\$489,759	25%
Total Library Expenditures	\$17,836,656	\$9,529,974	53%
Professional Staff (FTE)	59	26	44%
Nonprofessional Staff (FTE)	126	46	36%
Total Staff (FTE)	185	72	39%
Percentage of professional staff	32%	36%	
Student Assistants	58	32	55%
Staff +student assistants	244	104	43%
Total Circulation	511,880	222,496	43%
Interlibrary Loan -- sent to other libraries	38,845	7,378	19%
Interlibrary Loan -- received from other libraries	28,780	9,129	32%
Ph.D.s Awarded	256	93	36%
Ph.D. Fields	55	43	78%
Faculty (instructional)	1,286	628	49%
Total students (full-time, not FTE)	22,510	9,946	44%
Graduate students (full-time, not FTE)	3,273	1,259	38%
Library staff/student ratio	1 / 122	1 / 138	

*University of Arizona, Colorado State University, University of Nebraska-Lincoln, University of California-Davis, Iowa State University, Washington State University, University of Colorado, University of Utah

**non-serials, non monographs (audiovisual, journal back files, maps, manuscripts, etc.)

*** Bibliographic utilities, literature searching, security devices, memberships, catalog records, etc.

With a relatively small staff, our biggest challenge is to deal with the University's present needs while preparing the Libraries' collections and services for the move to the Knowledge Center. **Several key staff positions are needed immediately to insure a successful move:**

- **Information Center Manager** -- responsible for the development of responsive and holistic on-site and remote reference services, coordinates with manager of the Computing Help Desk to integrate the two service points, directs public services staff training, and oversees development of a new Knowledge Center Web site. [Librarian II or III]
- **Two Library Assistants for collection preparation** (before the move to the Knowledge Center) and for ASRS support and scanning for desktop delivery and digital projects (after the move). [Library Assistant II and III]

Building a Knowledge Center

Even the most traditional and respected research libraries are beginning to reinvent themselves to fit a world turned upside down by the Internet. Libraries are being redesigned as collaboration spaces for students and faculty, as technology laboratories for access to advanced hardware and software, and as social spaces where informal communication is enabled. Designing a state-of-the-art facility that will bring together the talent, skills, equipment, and technological expertise within scattered IT units into one physical place provides exceptional opportunities to create an optimal environment for academic collaboration and innovation that may serve as a model for higher education.

As a testament to the difficulty of these attempts at change, national statistics show that visits to libraries and the use of physical library materials and services continue to decline in the majority of academic libraries.² At Nevada, we responded early to these changes and were able to build on our organizational advantages and strengths in reinventing the library as a component leading to the Knowledge Center. The organizational integration of the library with IT units in the early 1990s pre-dates what is now the widespread convergence of information technology and information content – positioning the library to respond quickly to changing campus information needs.

Designing spaces to house future services has focused staff attention on the study of trends and forecasts in the information arena with an intensity that has inspired the redesign of our traditional services and library spaces to anticipate campus needs that have not yet been expressed. A culture of responsiveness to change is cultivated in the library, allowing the University's Libraries to break from tradition more readily than its counterparts. Risks and experimentation have paid off during early efforts to hasten the transition from a print-based scholarly communication system to a digital environment. The groundwork has been established for staff to take on additional roles in a more broadly defined information environment and knowledge economy.

Campus conditions – the growth in enrollment, the shortage of space, and the central location of Getchell Library – have transformed the library into a crowded social center with food and drink, group study areas, and an expanding computer lab, providing a strong foundation for designing Knowledge Center services for students with diverse needs.

Providing Information

The Knowledge Center is being designed to meet the learning needs of tomorrow's students and the collaboration, information, and technological needs of tomorrow's faculty. The emphasis is on enabling students and faculty to consume and produce digital products more effectively. However, the "analog" library resources that will be housed and used in the Knowledge Center are rich and significant, representing a huge investment by the State of Nevada and a large body of knowledge that will not be accessible in digital format for many years. Although online journals and databases are increasingly popular, **books and other print materials are still heavily used and valued.** Library collections to be housed in the Knowledge Center will

² Association of Research Libraries. *Statistics*. <www.arl.org>

continue to consume staff and financial resources. Staff pressures related to the move to the Knowledge Center are already acute, as additional staff are needed to prepare collections to be moved.

The University Libraries spend a higher proportion of our materials budget on electronic resources than research libraries as a whole (see Figure 4). Print materials, however, are still in demand, still requested, and still purchased and used, although in-house use has declined (see Figure 1).

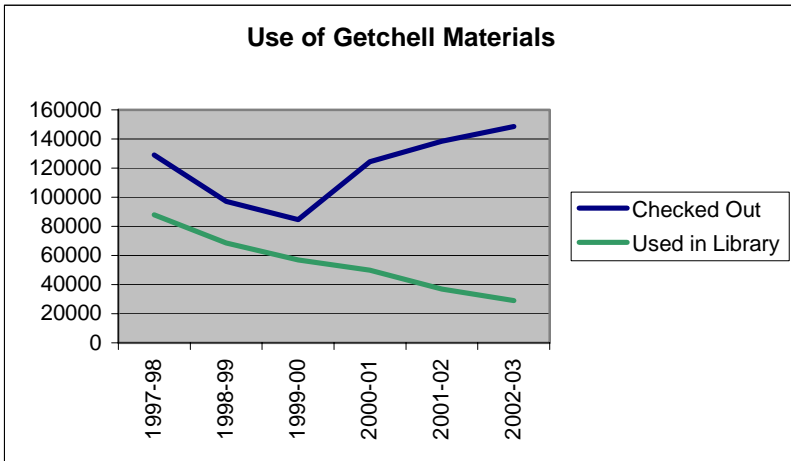


Figure 1

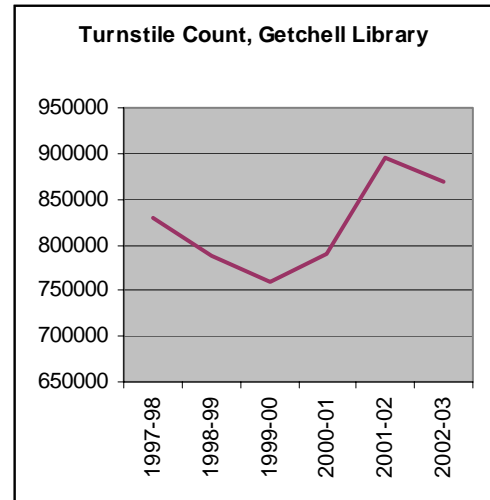
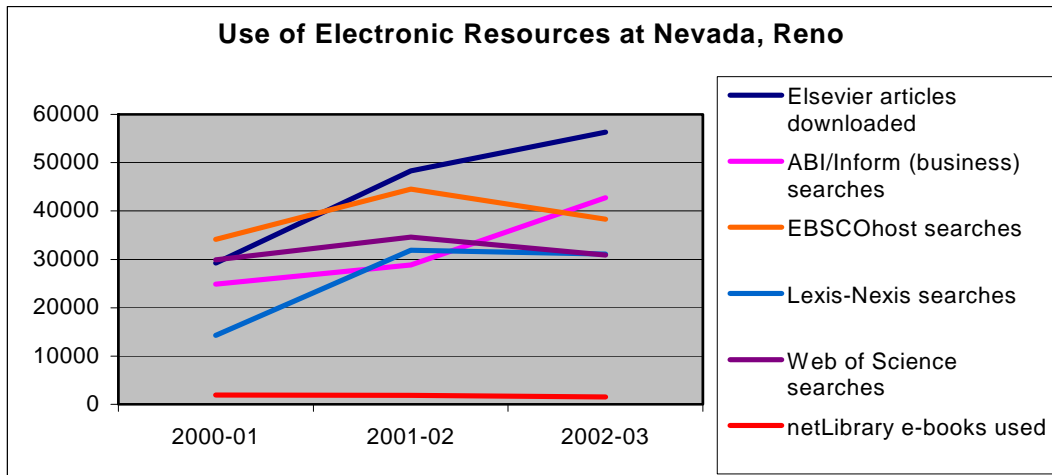


Figure 2

Electronic books have not yet attained the popularity of electronic journals and databases (see Figure 3). The library has gradually been building an e-book collection and monitoring its use, and it appears that when our users want books, they generally ask for those in print. We predict that e-books will eventually become as ubiquitous as e-journals, but until that time, the library will continue to acquire printed books. In addition, not all print titles are yet available in electronic format.

Through anticipatory budgeting, partnerships with other academic libraries, and the discounts available to early adopters, the Libraries have acquired an impressive collection of electronic



journals. Journals formerly available at the University only through Interlibrary Loan are now available online through one of several comprehensive package deals from publishers and are being used – heavily, in many cases. However, the terms of these agreements lock the Libraries into **substantial financial commitments that can only be sustained through a combination of careful reprioritization of library resource acquisitions and increased funding**. In other words, many of our journal subscriptions are no longer by title; they are purchased as larger groups of titles. While we have achieved substantial discounts and more titles in total, we no longer have a granular way to reduce journal subscriptions, one title at a time. **It should be noted that annual increases in the cost of subscriptions (individual and bundled) range from 5-9%.**

Figure 3

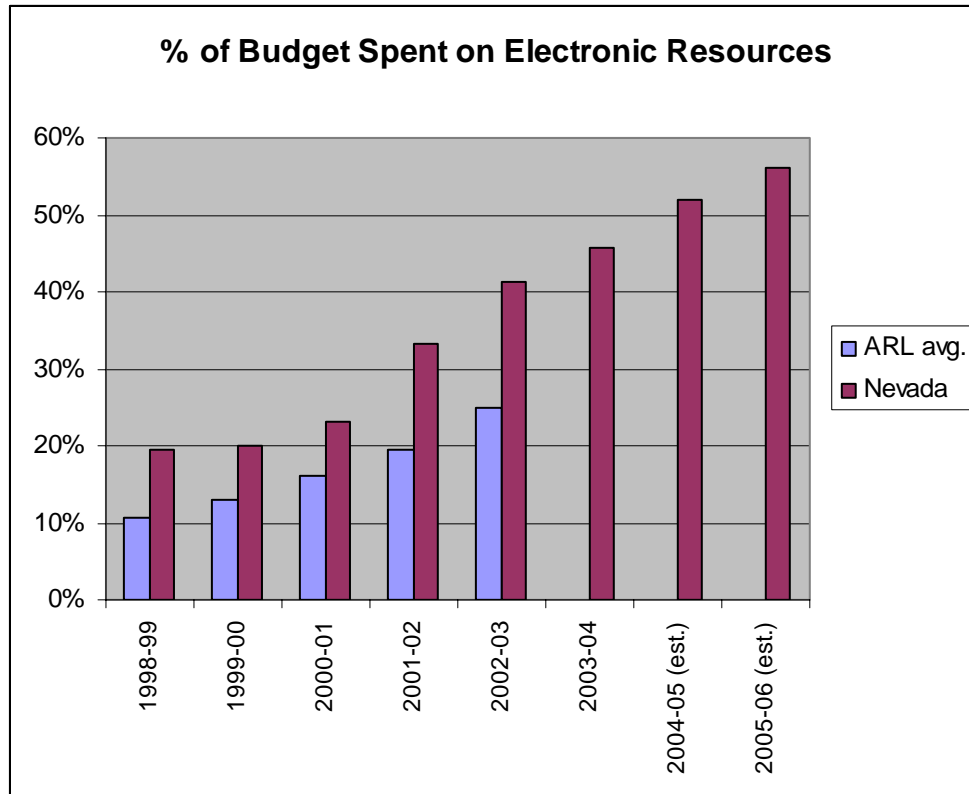


Figure 4

The Libraries house **unique primary research materials**. For many students and faculty in the humanities and social sciences, scholarly research depends on the availability of primary sources. Research libraries preserve and provide such primary resources as part of their basic mission. Ultimately, these collections differentiate the University of Nevada, Reno Libraries from other libraries and attract scholars from around the world (as in the case of the Libraries' Basque culture materials), as well as serving the Nevada community. Digitization will greatly increase the visibility and the usability of these materials, but the cost of digitization and the Library's sparse staffing will limit the scope of any digital initiatives.

Developing a Knowledge Center Web

The Knowledge Center Web will enhance the value of information delivered to the desktop by **integrating the online information resources with content management tools, to make acquiring content and creating new knowledge more transparent**. The Knowledge Center Web will support collaborative online workspaces and provide tools and other infrastructure for faculty to use in constructing online scholarly communication and research communities. The Knowledge Center Web will reflect the realities of the post-Gutenberg world-- "*a world where video, images, sound, and interactive things are on a much more equal footing with text, and text is no longer privileged in the ways it has been historically.*"³

³ C. Lynch, Digital library opportunities. (2003). *Journal of Academic Librarianship*, 29(5), 286-289.

Although quality online information is no longer scarce, the University Libraries provide a fundamental service to faculty and students in selecting, brokering, and organizing targeted, authenticated, quality resources. Many of these resources are either unavailable elsewhere or available to individuals only at high cost. Using the library's gateway to online resources will save members of University community time and make them more efficient and effective in doing their academic work. For the Libraries to be successful in serving this gateway function, these basic conditions must be met:

- The Libraries must know users and must understand what information resources they need, how they use them, and how they prefer to access them.
- The Libraries must promote our role as a gateway to valuable Web-based resources to which the University community otherwise would not have access. In recent large-scale studies, students and faculty have expressed strong confidence in their abilities to bypass university libraries to find any information they need on the open Web. Their confidence is often misplaced.
- Library-provided resources must be easy to find and easy to use. Google-familiar users will neither tolerate obstacles in accessing resources nor cope with complex information retrieval systems. Research shows that Web users will make cost-benefit tradeoffs in terms of the quality of information and the time and effort it takes to discover and consume it.

Managing University-Generated Data, Information, and Knowledge

Recently, the distinctions between “academic” IT and “administrative” IT have become less apparent. The organizational merger of traditionally separate functions has resulted in efficiencies, synergies, economies of scale, and has transformed our focus to a “user-centered” perspective with these values:

- administrative data and internal knowledge have value to external stakeholders;
- “institutional research” has academic applications;
- the university's customers want to do business online and they need the information that will help them conduct business outside of office hours;
- the Web opens up new and better possibilities for sharing organizational information within the University; and
- members of the University community want more interpenetration between their own data, unpublished organizational data, and other information resources.

Increasingly, interoperability among systems as well as ease of end-user access (within the limits of privacy and confidentiality requirements) is a necessity in information systems on campus. As part of the IT organization, the Libraries have taken on duties and roles with administrative information that are not common in academic libraries. The Libraries are involved with “University” information in several traditional and non-traditional ways:

- The University Archives collects published and unpublished documents, records, and other materials from the University and the offices of the University and Community College System of Nevada (UCCSN) and organizes and preserves them for research use.
- The Library's DataWorks unit has created a GIS project to estimate the number of University of Nevada, Reno students residing in each Nevada Board of Regents district.
- DataWorks, in conjunction with the University Planning and Budget Office, tested and evaluated SPSS Cubes and SQL Server software as a platform for the University's *Data Book*.

The Libraries can play a larger role in collecting and organizing information about the University. The management of digital records on campus is a challenge that is appropriate for library involvement. Organizationally, an electronic records specialist could be affiliated with University Archives or with an administrative IT unit. There is no individual on campus with qualifications to fill such a position, and for various legal, administrative, and historical reasons, the University needs to provide for such a position.

Supporting Knowledge Acquisition, Development, and Dissemination through KnowledgeWorks

The Libraries have developed a team-based approach to providing enhanced services for knowledge acquisition and development through a new organizational entity called "KnowledgeWorks." KnowledgeWorks is a collaborative working group, not a formal organizational unit. KnowledgeWorks is a coordinating umbrella for three collaborative initiatives: DataWorks, MediaWorks, and WordWorks. The mission of KnowledgeWorks is to coordinate Library and IT staff and resources to provide effective access to the digital scholarly output of University of Nevada, Reno researchers, and to enhance access to digital resources that support University research and scholarly activities. The role of KnowledgeWorks is to identify new projects that are cross-departmental, such as the Campus Photo Tahoe Projects initiated in 2004, and to bring together the appropriate Library, IT, and University staff and resources for implementing such projects.

DataWorks supports academic data services:

- DataWorks provides storage space for data, such as the large Census dataset maintained by the State Demographer. DataWorks provides "hosting" space for University units publishing e-journals. For example, DataWorks will soon host the College of Engineering's e-journal, *International Journal of Microwave & Optical Technology*.
- DataWorks supports software for data analysis and visualization – available both in the DataWorks Lab and on the Citrix Applications Server. DataWorks supports and promotes ArcIMS, Cubes, and SharePoint collaboration software. For example, the University's Human Resources department is planning to use SharePoint for faculty search committees, enabling Web access to applicant resumes, evaluation forms, and other shared documents.
- DataWorks hosts and manages the WM Keck Earth Sciences and Mining Research Information Center Web site, which receives approximately 500 hits each day. In collaboration with various state agencies, several new geo-datasets are added each year. Keck

additionally provides geography-based point and click interactive access to data through ArcIMS based indices.

The Libraries are moving towards more extensive involvement with academic data, information, and knowledge generated by University units. Through DataWorks, the basic components are in place for the Libraries to manage and provide access to the digital scholarly output of the University's researchers, including scholarly publications and presentations, data generated from research, working papers, simulation models, and other objects. DataWorks provides a stable platform, preservation, backup, access management, and descriptive metadata for collections of data in any format, as well as a software environment for data analysis and visualization and tools to help faculty disseminate their work.

MediaWorks and WordWorks coordinate projects related to visual images and textual documents, respectively. The MediaWorks group is working on a campus-wide project to digitize, organize, and preserve photographs. Thousands of photographs from Special Collections have been digitized; the Libraries' Digital Projects unit has organized exhibits featuring several hundred photographs – images of Lake Tahoe, Sagebrush Vernacular (rural Nevada architecture), and a Lincoln Highway collection, as well as Nevada History in Maps. The Basque Library poster collection is also being digitized for online access.

Process for Planning and Resource Allocation (Appendix E)

The primary driver for IT and Library planning is the overall mission and goals of the University and its respective units. Given the rapidly changing nature of information technology and its numerous applications throughout the campus, the Division engages in ongoing planning within the parameters of campus needs as outlined through the strategic planning process. Internally, the Division engages in continuous planning and redefinition through weekly IT and Library director meetings and semi-annual all-staff meetings.

To address broader issues, the Division receives input from individual clientele and through countless meetings of staff and administrators with University faculty, staff, and students, at all levels. During the past year, the Vice President for Information Technology has encouraged a closer working relationship with the Faculty Senate 111 Committee. The Division has hired a technical writer to provide documentation for the Division as well as to produce informative bulletins and news releases that outline ongoing activities, new and existing services, and suggested enhancements for which input will be solicited.

The very nature of information technology and the culture of the Information Technology Division make a 1% target of internal reallocation unrealistically low. The Division's reallocation in such a rapidly changing environment far exceeds the 1% reallocation target as is demonstrated above, and in even more detail in the plans of earlier years. Information technology is a moving target and the institution's needs are in almost constant flux. Combined, these forces require vigilant and ongoing reevaluation of strategies and appropriate technologies to best serve the Division's clientele.