InfoTech Planning Project
Customer Needs Assessment

Administrative Summary

Prepared for:
InfoTech Planning Steering Committee
InfoTech Planning Customer Council Members
InfoTech Planning Provider Council Members

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Audience for and Purpose of this Document

Audience
This summary was prepared for the InfoTech Planning Steering Committee, Customer Council Members, Provider Council Members, and people who will be involved in the next step of the InfoTech Planning Project.

Purpose of this Document
This document provides a detailed summary of information that key informants about information technology at the University of Minnesota provided during administrative focus groups. The focus groups were conducted as part of the Information Technology Planning Project.

For readers who are not interested in the amount of detail provided in this document, a summary of major findings across all five functional focus groups (administration, instruction, outreach, research, and student) will be available early in 1994.

The following are provided in this document:

- a background section, which describes the Information Technology Planning Project,
- an executive summary, which highlights key findings, and
- a findings section, which details participant focus group comments.

Read the findings section if you want to:

- understand and read about specific examples of how administrative personnel are using information technology,
- learn what administrative personnel think is working and is not working in terms of information technology,
- understand what administrative personnel view as key information technology challenges and next steps the University should take in order to meet their information technology needs,
- make informed budgetary and organizational decisions during your unit planning cycle in order to meet information technology challenges facing administrative personnel, and/or
- improve current information technology services.

Other Focus Group Summary Reports
If you wish to acquire or read summary reports from the outreach, instructional, research, or student focus groups, or if you need the reports in alternative format, please contact:

Office of the Associate Vice President for Academic Affairs/Academic Computing & Information Technologies
University of Minnesota
8 Morrill Hall—100 Church Street SE
Minneapolis, MN 55455
Telephone: (612) 626-9816.

Text of the reports also appears on the Internet Gopher. The path is:
\Home Gopher Server
  \University of Minnesota Campus Information
  \University Planning
  \Information Technology Planning
  \Customer Assessment Reports.
### Background

#### InfoTech Planning Project

Senior University management created the Advisory Users Committee (AUC) in 1992 and asked this committee to create a vision of computing and information technology for the University of Minnesota. In August, 1992, the AUC created a vision statement; senior management then chartered an Information Technology (InfoTech) Steering Committee which recommended a five-step planning process to implement the vision:

- review University strategic direction
- assess customer needs for information technology
- assess existing information technology investments
- develop strategic information technology architecture, and
- develop tactical implementation plans.

The InfoTech Steering Committee established the InfoTech Planning Team which has reviewed University strategic direction, assessed customer needs for information technology, and assessed existing information technology investments. Several documents have been created that report on customer needs for information technology and provide details on existing information technology investments. These reports will be distributed Winter Quarter 1994 and will help to guide decisions made in the next step of the Information Technology Planning Project. (See Appendix 1 for more background information on the Information Technology Planning Project.)

#### Purpose of Customer Needs Assessment

The customer needs assessment has two purposes: (1) validate the AUC vision with University units, and (2) assess University of Minnesota customers needs for information technology.

This information will help guide decisions made in the next step of the Information Technology Planning Project, and will also be shared with providers of information technology at the University for their planning use.

#### Customer Assessment Process

**Key Informants.** Key informants of information technology were nominated by their collegiate, campus, or unit administrator (see Appendix 2 for list of units) to form the Customer Council. Customer Council members attended meetings and participated in focus groups, and will fill out a survey (described below). A smaller (19 members) subset of the Council, the Customer Council Liaison Group, was more heavily involved with the project by offering suggestions for writing final reports and providing feedback on drafts.

**Customer Council Meetings and Liaison Group Meetings.** Customer Council members attended three meetings where they were informed about the planning process and listened to invited speakers discuss future information technology trends. Liaison Group Members attended several meetings where they provided feedback on draft reports and discussed the information technology planning process.

**Focus Groups.** Focus groups were conducted in order to validate the vision and assess customer needs (see below for further detail; a comprehensive description of the process and participation is also provided in Appendix 3).

**Survey.** Early Winter Quarter 1994, a survey of Customer and Provider Council members will be conducted that will produce ratings to be used in developing a ranking of steps the University should take in the next 18-24 months to meet customers needs for information technology.
Focus Group Purpose

The purposes of the focus groups were to:

- understand users' current work environment and information technology use as well as their future information technology requirements
- understand information technology users' reaction to the AUC vision, and
- obtain a list of exciting information technology projects.

Focus Group Process

There were 21 focus groups conducted from August through October, 1993. An outside consultant was hired with skills in strategic planning and focus group facilitation to moderate the focus groups (see Appendix 3 for further consultant credentials). Key informants self-selected into the following functional roles and attended corresponding focus groups: administration, instruction, outreach, research, and student.

Focus group participants completed a pre-focus group survey and answered a set of common questions during the focus groups. (See Appendix 4 for pre-focus group survey and focus group questions.) The InfoTech Planning Team members conducted a rigorous, reiterative process for synthesizing data from the focus groups. (As noted above, Appendix 3 provides more detail on this process.)

About the Administrative Focus Groups

There were six administrative focus groups conducted during August, September, and October, 1993, with a total of 49 key informants of information technology participating. Thirty-six of the 49 individuals completed surveys.

Participants expressed appreciation for the opportunity to contribute to this assessment, became very involved in answering questions, and joined into in-depth discussions of information technology issues. Responses included individual participant replies to moderator-initiated questions and group-generated discussion.

Future Reports

One other customer assessment report has been written and is being sent to Customer and Provider Council members, administrators who nominated Customer Council members, the Senate Committee on Computing and Information Systems, and the President's Cabinet. This report summarizes major findings across all five functional focus groups. Additional copies of the report will be available early in 1994.

A concurrent assessment of existing University information technology investments is being conducted and a report on these findings will be available early in 1994. Lastly, a report which combines customer and provider assessment summaries will also be available early in 1994.
Executive Summary

This summary highlights the key findings for the administrative focus groups, and is structured so as to provide an outline of the Findings section.

How Participants Talk About & Use Information Technology

This section describes how participants define information technology and how they use it in their work.

- The term information technology means different things to different people.
- There are basic information technology tools that support administrative functions. Most participants use these tools to perform their day-to-day tasks.
- Participants stated that administrative functions are dependent upon a data continuum that is supported by information technology.
  
  Most participants use central systems to enable collection, storage, maintenance, extraction, reporting, and analysis of data.
  
  Some departments are actively acquiring and developing their own information technology solutions that may or may not interface with central systems.
  
  Some areas need to link outside the University in order to support their administrative functions.
- Participants stated how information technology is integrated into their daily activities.
  
  Most people view network access, basic tools, databases, and support as critical information technology components for the administrative functions.

What’s Working Now? What’s Not Working?

The following two sections detail what participants in the administrative focus groups think is working or not working in terms of their use of information technology. Participant comments are organized under these five general categories:

1. Base Services
   - Network/Access
   - Hardware
   - Applications & Information

2. Support Services
   - Reliability
   - Problem-resolution Services
   - Training

3. Policy/Guidelines

4. Organizational Structure (central and other)

5. Human Resources
What's Working Now?

Base Services: Network/Access

- Overall, people are satisfied, to date, with the advances of the network on campus.

Base Services: Hardware/Software

- A few people noted how pleased they are with the University Bookstore computer purchase operation.

Base Services: Applications & Information

- Some people feel the past and future institutional application and reporting environments are on the right track.

Support Services: Reliability

- Some people commented on the reliability of the Administrative Information Services (AIS) mainframe environment, and some specifically commented on the reliability of LUMINA.

Support Services: Problem-resolution Services/Help Lines

- Most people feel that most services work well (e.g., AIS and E-mail).
- Some people made note of a positive change; people are now being encouraged and helped by AIS and Computer and Information Services (CIS).

What's Not Working?

Base Services: Network/Access

- Everyone on campus does not have access to the network from their office/work environment; some people feel that this causes confusion, frustration, and problems.

Base Services: Hardware/Software

Some participants noted that currently:
- we do not model information technology investments like other capital investments.
- we do not safeguard our information technology investments like other capital investments.
- people are underutilizing their information technology investments.
- we do not have standards for information technology acquisitions based on mission/needs/function.
- there is some movement toward downsized (i.e., not mainframe) platforms; however, some people feel we are not moving fast enough. Barriers mentioned to reaching this goal are the lack of 1) funding models, and 2) organizational coordination and cooperation.
Base Services: Applications

Some people feel that:

- systems are not built to meet departmental needs.
- applications are not easy to use.
- systems staff should move to a more cost-effective environment.
- Some participants see a major flaw in the amount of responsibility put on departments, with no authority and/or mechanism for on-line entry of documents into operational systems and/or the ability to transmit information across the network to complete a process/work flow.
- Some participants expressed concern that there is inadequate money for maintaining and/or upgrading some of the current operational (i.e., mainframe transaction) systems.

Base Services: Information

- Some people currently do not have access to data they need to perform their job (including source data information as needed).
- Some people feel that data may not be accurate, and may be used inconsistently (i.e., there are no consistent data definitions, and accessing data definitions and “in use” reporting examples is non-existent or difficult).
- Some people are receiving too much unnecessary information.

Support Services: Problem-resolution Services/Help Lines

- Some participants stated that there is no such thing as a “one stop shop” here, and it is not clear who to call when you have a problem or need support, training, or access to data.
- Some participants indicated that tools are available, but people are not sure which tools will work for the purposes needed in their department—and there is a lack of support in helping people determine this. The question was posed: “If you want a local area network (LAN), who makes that decision and how?”
- Some people cited specific problems working with some service providers.
- Additionally, some participants feel that there is a lack of understanding at the University about what kind of support ratio is adequate.

Support Services: Training

- Some people stated that we need to do more than provide the technology.
- Some people do not have time to figure things out on their own; self-training is especially unfair to those in low paid positions.
- Technology is moving so fast that some people expressed concern and discomfort about being able to do the tasks at hand.
- Some participants noted that the training that does exist is not sufficient.
Policy/Guidelines

- Some people expressed that, currently, there are no University-wide personnel policies relating to information technology.

- Some people also stated that, currently, there are no University-wide policies relating to information technology acquisitions.

Organizational Structure (central and other)

On support: some participants are not sure that central organization/support is the best way to provide assistance and services because of unfamiliarity with specific departmental business or needs. At the same time, single departments cannot handle the required support.

On policy: some participants stated that it is not clear who is responsible, and for what.

On coordination of information technology: some people do not know what services are available and who supports each.

On funding: some people indicated that the current central technology model does not fit the distributed situation/environment.

On guidance: some people noted that, currently, technology needs are mapped to central requirements, not to function or business needs.

On control: some participants stated that, currently, decisions are based on who has the money, not on the benefits to the University as a whole.

Human Resources (reward, recognition, career path)

- Some participants expressed how job classifications for information technology-related positions are out of date.

Key Challenges and Next Steps

Key Challenge: Find ways to be more efficient and effective in core administrative activities.

Some people see a challenge in doing more with less and replacing staff with information technology.

Most people see a challenge in doing things differently and increasing awareness and communication.

Some people see a challenge in doing things faster.

Next Steps: Some people would like to see University administration at least state that it is committed to doing electronic forms, work flow, and groupware.

Some people would like to know if a “disaster recovery solution” is coming.

Some people would like to see an electronic communications system where people are directed to go to get official and/or current information.
Key Challenge: Develop appropriate policies, organization, and infrastructure—within the University and the broader community—to support the effective use of new technologies (e.g., telecommuting issues).

Some people see a challenge in evolving policies that keep up with impacts resulting from deployment of information technology.

Next Steps: Overall, people would like honest and open communication (e.g., being kept informed of "things in the works").

Some people would like some central oversight, including decisions made on where the money is going to come from and where the money is going to go.

Some people would like to see some type of prioritization process.

Some people would like to see funding readjusted to meet information technology needs.

A few people would like some guidance to promote "buying smart and hiring smart."

A few people would like to see funding provided to do "experimental type" things (e.g., on-line grant proposals, distance learning).

A few people would like to see AIS and CIS combined.

Key Challenge: Support and manage departmental data repositories.

Some people see a challenge in managing departmental data repositories.

Next Steps: Some people would like to see a central clearinghouse which provides a comprehensive list of data/information that is available.

Some people would like guidance in deciding what data to keep and how long it should be kept.

Some people would like to have central providers support data archival and retention.

Some people want archival, storage, and retrieval of historical data.

Key Challenge: Keep up with rapid changes in information technology.

Some people see a challenge in having continual staff and faculty information technology support and training.

A few people see a challenge in keeping up with daily tasks while information technology tools enable "more to be done" (thus requiring more time).

Next Steps: Some stability—a few people would like to stay in one place for some time.
Findings

The Findings section in this document is divided into three categories:

How Participants Talk About and Use Information Technology
This section describes how participants define information technology and how they use it in their work. Focus group participants provided many examples demonstrating that information technology is supporting the University’s mission.

What’s Working Now? What’s Not Working?
This section contains participant views on which aspects of information technology at the University work well and which do not work well. Participants frequently identified aspects of information technology as both working and not working. For example, some participants stated the network works quite well, while others stated the network is not truly effective because it is inaccessible from too many places.

Key Challenges and Next Steps
This section describes what participants discussed as key challenges for meeting their information technology requirements. Also listed are next steps that participants stated the University should implement in order to enhance the likelihood that their information technology requirements would be met.

Note: In this section of the document, the words “few,” “some,” and “most” have been used in order to help the reader understand how many people discussed an idea or made a comment during the focus group sessions. The word “few” means that the idea was discussed or comments were made in one focus group, “some” means in two or more focus groups, and “most” means in all focus groups. Material in italics is quoted information from the focus group sessions.

How Participants Talk About & Use Information Technology

The term information technology means different things to different people.

Most people concentrated on “information” (i.e., data) and “technology” (i.e., hardware and software) as separate components. The thinking here was “future thinking” where “information” takes all shapes and forms (e.g., images) and the “technology” enables the creation, transmission, and reception of the “information.”

However, some people believe the most important function of information technology is as an enabler allowing them to more effectively perform their day-to-day tasks—not just simply to create, transmit, and receive, but also to apply information technology usefulness to processes.

A few participants described information technology as a continuum; we are all providers and we are all consumers in some form or another. It is sometimes difficult to determine where one person’s responsibilities end and another person’s begin—where we all fit in.

I think we need to go a step...beyond just the hardware, the software, the communications. Information technology also involves process. You can’t separate process from the hardware, from the software...you have to really look at the processes that are involved within certain units and organizations, and then determine how those processes should operate. What kind of support can the hardware provide to those processes? Without process redefinition, you end up with real problems. You end up with a solution based on technology, which eventually costs you an arm or a leg....If you automate a mess, you get an automated mess....It means looking at the technology as well as the process re-engineering to fit the technology.
There are basic information technology tools that support administrative functions. Participants use these tools to perform their day-to-day tasks.

Most participants use the following tools:

- E-mail
- calendaring
- fax
- word processors
- desktop computers
- spreadsheets
- LANs
- network access
- the Internet (BITNET)
- databases (project management, process flow charts, statistical software), and
- links to administrative systems (e.g., LUMINA, AIS, General Storehouse, Gopher, external credit bureaus, Medical Assistance, paper publications, Printing & Graphics) for data input, data reporting, and data distribution

Participants stated that administrative functions are dependent upon a data continuum that is supported by information technology.

Most participants use central systems to enable collection, storage, maintenance, extraction, reporting, and analysis of data.

How information technology supports data collection:

Data collection begins at a local administrative level. Data is either directly entered on-line from the local level or paper documents are processed and sent to central for entry. In some cases, data entry is also done at the local level (e.g., to enhance/tailor reporting needs).

How information technology supports data storage/maintenance:

Most data that supports administrative functions is stored and maintained by AIS, the U Foundation, and Health Sciences (i.e., central mainframe). Some data is stored and maintained at the local level with “shadow” or departmental systems (e.g., Gopher server, General Storehouse, CUFS “shadow” system).

How information technology supports data extraction:

Most people extract data with a query facility. The shift has moved to people bringing the data back to their local level. People use a variety of methods for transferring/moving data from the source location (e.g., AIS mainframe) to their local level (e.g., Mac on desktop). At the local level, people are doing further data enhancement and manipulation (i.e., adding data that has been collected, stored, and maintained at the local level).
How information technology supports data reporting and analysis:

Most people extract data and move it to the local level, then add data on the LAN/PC/Mac desktop end for further reporting and distributions.

Examples of reporting:

- comparisons of historical and current data
- cost studies (money, space, students)
- faculty effort/workload
- tracking of student progress toward degree
- student headcounts
- student class lists
- student advising
- student recruitment
- successful graduates
- processing of financial aid applications
- CUFS
- payroll
- general ledger
- budget
- patient and student calendars, and
- patient treatments.

Some departments are actively acquiring and developing their own information technology solutions that may or may not interface with central systems.

The following are several examples of some departmentally developed systems:

- A department has undergone a major business process re-engineering effort. They have moved data off of the mainframe to Sybase servers and have eliminated 80% of paperwork and faxes. They have deployed significant technology with this effort and have used a lot of outside technical help and analysis. The responsibility of technical support has been spread among their staff; staff take turns attending user groups and share what they learn with other staff. They have also collaborated with vendors and key developers to provide support and ongoing application training (e.g., Microsoft).

- A college has gone through some re-design of administrative processes. They are currently working on a budget preparation exchange with deans and associate deans. They are moving toward getting data from departments and transferring the data to central systems. They currently have a Novell network with 280 nodes in 7 buildings on 2 campuses, with IBMs and Macs. The network is used for communications, file sharing, and peripheral sharing. Eventually, they want to automate routine tasks and gather information over the network. They will also be moving to on-line forms processing.
A department went on a “high risk venture” to bring technology into a chaotic environment as a solution. So far it has paid off. They have created benchmarks and now do exception reporting. They went through all business segments and applied technology solutions where beneficial: maintenance management, CUFS, business process re-engineering, and benchmarks. They have deployed this with an RS6000, 3 file servers, 250 nodes, printers, and electronic data interfaces to everything except vendors.

One unit has 200 Macs on an Appletalk network, and 200 PCs on a Novell Network, with advanced function printing facilities and emerging two-way video capabilities.

Some areas need to link outside the University in order to support their administrative functions.

Some examples of this are as follows:

• University reporting processes save time and money with media links to small town weekly newspapers.

• Student financial aid processes are dependent upon data received from the federal government via a batch process.

• University clinics process patient accounting with data from credit bureaus and Medical Assistance (e.g., eligibility verifications).

Participants stated how information technology is integrated into their daily activities.

Most people view network access, basic tools, databases, and support as critical information technology components for the administrative functions.

Administrative functions need network access. The only way to do business now is dependent upon the network. When the network goes down, people think they might as well take the day off.

Administrative functions need basic tools: E-mail, voice mail, electronic calendaring, word processing, spreadsheets, and databases. On-line access, production data, policies, reporting data, and institutional data are also critical to administrative functions.

Note: two people noted specific CUFS reports as critical; one person noted that access to AIS is not critical because there is not full access to data (i.e., capability to read but not update data).

Administrative functions need technical support. As people become more and more reliant on technology, they also become more reliant on the support people to meet their technological needs.

I have had people tell me they would rather take the phone off their desk than break the network connection.

...the only thing worse than CUFS is not having CUFS....
What's Working Now? What's Not Working?

As noted previously, participants were asked to identify what is working and what is not working in terms of how they use information technology. Participant comments covered a wide range of ideas and experiences and stated high expectations. It was clear in all focus groups that people often could not talk about what is working without talking about what is not working. In this report, we have separated the comments on what is working and what is not working, simply for ease in reporting data.

Participant comments from all focus groups—administrative, instructional, outreach, research, and student—tended to fall into five general categories:

1. Base services
   • Network/Access
   • Hardware
   • Applications & information
2. Support services
   • Reliability
   • Problem resolution services
   • Training
3. Policy/guidelines
4. Organizational structure (central and others)
5. Human resources

The following two sections detail what participants in the administrative focus groups think is working or not working. We have organized participant comments under the five general categories listed above.

What’s Working Now?

Base Services: Network/Access

Overall, people are satisfied, to date, with the advances of the network on campus.

Most people feel there has been a lot of progress in the recent 2-3 years with the University network, specifically in access to the Internet and remote printing.

Some people recognize the benefits as Telecommunications and University Networking Services put standards into place.

Some people feel that there is very good technical support staff on the networking side.

I think Networking Services [is] doing an outstanding job of linking the campus together. As I said before, I have people all over the place. I just go to an office, install the Novell drivers on their PC, and suddenly they're right on my server interacting with other people on the network and sharing data on common database[s]. And that's all come to pass in the last two years—since I got on campus....I just think that's a tremendous project they undertook, and I think they did a very good job of implementing it.

Base Services: Hardware/Software

A few people noted how pleased they are with the University Bookstore computer operation and feel that this has helped to create de facto standards on campus.
Base Services: Applications & Information

Some people feel the past and future institutional application and reporting environments are on the right track.

People feel that the data reporting and extract/retrieval environment at AIS (AS/DB2) has been useful. (Note: some people mentioned, however, that the data did not fully meet their departmental reporting needs.)

People view the movement of institutional reporting data from the mainframe to the client/server environment as a positive step—something we are doing right. People view the benefits of easier access, easier tools, no SecurID logon, and no repeated learning curves and see a huge advantage to move forward and develop applications over the network, taking data from anywhere. However, there is reservation in some areas to move because it requires learning a new query and reporting language (i.e., if AS is not available in the future), but for the most part, people are excited at the possibility of accessing institutional data with applications they already use (i.e., “off the shelf” applications such as Paradox).

Some people feel the University’s leadership with Gopher is outstanding. One example of saving time and having more accurate orders comes from the Bookstore’s on-line computer inventory via Gopher; people are able to see what is in stock, and make more reliable orders.

Some people are happy with the recent implementation of E-mail at the University. We are far ahead of other institutions in this regard—people see this as a bold administrative step. There have been some problems, but this is a step in the right direction. (Note: some people would like to see one common E-mail system or E-mail systems that are compatible in functions.)

Support Services—Reliability

Some people feel that AIS has served them well over the years; it has been a very reliable, stable, and comfortable environment (mainframe) and has provided good service. The AIS network and systems are better every year, there are no system outages, it is very stable now, and the staff are very responsive. AIS staff stability (lack of turnover) is seen as a positive influence on continuity in service provided.

Some people feel that LUMINA is a very reliable and impressive system, and that it provides a lot of service to everyone at the University. It always works and it is always there.

LUMINA—that is an incredible timesaver. I now take that for granted.... The time involved is cut so much shorter that I am much more likely to use the resources of the University Libraries, whereas before I might have thought, ‘I am just going to go to the Bookstore and buy that book instead of using the resources that we have here.’

The creation of institutional databases and the use of AS to manipulate those has just been an enormous boon to us, just enormous. We have been able to report things we’ve never been able to report before, and it would have cost us tens of thousands of dollars to get the kind of reporting that we can do at the drop of a hat.

...being able to look up people’s current addresses and phone numbers on-line—that’s an incredible timesaver...
Support Services: Problem-resolution Services/Help Lines

Most people feel that most services work well (e.g., AIS and E-mail).

Some people made note of a positive change. In the past, people with the desire and capability “to do” had to “do all” themselves. Now that mentality is changing; people are now being encouraged and helped by AIS and CIS.

Examples mentioned:

• AIS is willing “to go out on a limb” on particular issues to help meet a departmental need (e.g., post electronic bulletin board on Public Access).

• AIS and others are willing to do pilot projects to get data to people and improve how that is being done (e.g., client/server).

• Some people see benefits in the AIS initiative to provide network (LAN) service. They see this as a huge void in service offerings and feel it is of benefit to have some group that has “the big picture” in mind to help with this support.

Some people feel that there are a lot of resources available to get help.

What’s Not Working?

Focus group discussions for this section always had a problem statement, usually followed by examples and impact statements, then followed by suggested solutions. The data in this section has been structured to reflect this process of Problem:Impact:Solution.

Base Services: Network/Access

Problem: Everyone on campus does not have access to the network from their office/work environment; some people feel that this causes confusion, frustration, and problems.

Impact/Examples: People express confusion and frustration. There were many examples:

• University central administration has policies or directives in place which require access to the network. A major example is paper flow reduction. While free E-mail accounts were given to all faculty, students and staff, the ease of access to the accounts was not. For example, one of the members of the InfoTech Customer Council has to walk over to a student lab to read E-mail and correspond with the Planning Team. Also, some deans cannot communicate via E-mail with all of their department heads and find it necessary to still maintain paper and electronic mailing lists. This is true for the administrative staff as well.

...I want to be constructive, but I must tell you that the tremendous frustration I have with this whole issue is just heightened by listening to you all talk about the things that you do...it makes me realize how much offices like mine—which have direct contact with students—are so much out of the loop in terms of availability of software and hardware, and particularly in terms of being hooked up to things like the Internet and E-mail. And there are historical reasons for that because funding has not gone to that sort of thing. Funding has tended to go to staffing and personnel...and there has not been a recognition historically of how technology can aid the...
• Creating “haves” and “have nots”—E-mail communication and access to all the Internet has to offer were the common denominators in concerns expressed about this phenomenon. Additionally, some units have no money to adapt or move toward deploying technology; they are living in the past in terms of capability. Conversely, those that are able to hire technical support staff have more elaborate automated systems, with improved capabilities.

People feel that there is a lot of connectivity on campus, but that we are still solving connections and moves one by one.

Solution: Most focus groups acknowledged universal access as a major issue and would like to see all (students, staff, and faculty) having access to the Internet. Clearly, focus group participants in the “have not” situation can see how they are becoming increasingly marginalized.

People would like to see standard ways to obtain access to computing resources (e.g., several standards for connecting hardware). People would like to see an infrastructure in place in University buildings for access to computing resources. People think central administration should be more involved in the responsibility of this architecture and should not leave it up to departments. People feel that there is too much waste and re-working as departments move and have to re-install computing and wiring resources.

To put some strength behind that [previous quote], I am in the Dean's office and the Dean's office has fortunately been dragged along....On the other hand, when we have to talk to departments—and that's a critical piece—some of the departments that have a real research need and are research driven...have everything they need; they fund it, they fund people to support it, and they are on-line. And [then] there are [other] departments....We can't get E-mail out to half of our departments...there is no funding....If the University is going to move ahead, then there has to be a pot someplace....We are going to need some help, and not only equipment and hardware but some expertise that has to be managed centrally.

...there is a huge mismatch between... availability and access....On the access side, when you are sort of out there looking in—seeing all this neat stuff going on—you realize some of the things you could be doing but also begin to realize how much you are becoming increasingly marginalized....[it’s] extremely frustrating.
Base Services: Hardware/Software

Problem: Some participants noted that, currently, we do not model information technology investments like other capital investments.

Impact: People have experienced payoffs from keeping technology components up to date (e.g., a real savings in paper, staff time, and access to and retrieval of data). Other people want to realize these savings. Additionally, we do not depreciate our investments (as is done with other capital investments) and do not have a good process in place for re-deploying surplus equipment from one department to another.

Solution: Some people expressed the need for capital improvement funds for equipment replacement and needs awareness/education of cost savings for doing so. In addition, people would like to see a recognition that information technology components such as hardware, software, communications, and training) are ongoing costs and that there should be maintenance and replacement costs for these components in the budgeting process (e.g., how to catch up, how to plan, and how to fund for continual equipment replacement).

Problem: Some participants noted that, currently, we do not safeguard our information technology investments like other capital investments.

Impact/Examples:

* safeguarding against things that might happen to our equipment during and after hours (e.g., staff “housekeeping habits” adversely affecting the equipment, children of staff visiting and being permitted to play games on departmental computers, etc.),

* safeguarding against viruses that could cripple and/or destroy our investments and data, and

* safeguarding against losing data that is valuable to the department and institution. (Questions asked: How do people document and back up files? What if the hard drive crashes and valuable data is lost—who is responsible? People just blame the computer and we ask no questions. We have developed this culture. We would not find it acceptable for someone to lose or destroy a cabinet full of valuable paper documents.)

...you need to replace it [computing equipment]. It is no different than a car or anything else—if it wears out, it won’t perform.

We really can’t [afford to] be a mediocre institution...if we don’t have a modicum of infrastructure here—let alone being a first rate institution—we can...let ourselves slide into oblivion, or we can grab ourselves by the collar and pull ourselves up....At the cost of doing some trade-offs...it is not an easy decision.

...the replacement and ongoing costs are something...people don’t like to talk [about]....The ongoing sort of cost that really keeps it [equipment] going...is not provided for....A percentage of budget or some long-term commitment is the only way to do that.
Problem: Some participants noted that, currently, people are underutilizing their information technology investments.

Impact: Some departments have no equipment while others have purchased expensive equipment and have put it on the desks of their staff. However, the equipment is not being utilized to its potential. A tremendous amount of money is wasted; people use less than what they have.

Solution: People would like better utilization of what we have and what is available.

Problem: Some participants noted that, currently, we do not have standards for information technology acquisitions based on mission/needs/function.

Impact: Some disciplines and functions require highly specialized tools, and some do not. Some people question how much diversity we can support and still be effective. On one level, diverse platforms are wonderful but on another level this may not be the ideal; in fact, this may be at the expense of some administrative functions.

Solution: Some people would like models to map technology equipment needs with mission or area, and need to be trained in how to use equipment to potential to meet mission. For example, some people want to understand when a department should invest in a LAN and what components/characteristics it should have.

Problem: Some participants noted that, currently, there is some movement toward downsized (i.e., not mainframe) platforms; however, some people feel we are not moving fast enough. Barriers mentioned to reaching this goal are the lack of 1) funding models, and 2) organizational coordination and cooperation.

Impact: With more and more departmental computing, people would like to see movement to downsized and newer platforms to allow for interfacing of systems and lower costs.

Solution: To do this, people expressed the need for better coordination and cooperation, and a model of funding to match.
Base Services: Applications

Problem: Some people feel that systems are not built to meet departmental needs.

Impact: People expressed the regret that our systems are built without regard to the input from business units and/or understanding of the underlying business systems/processes. Although business level input has at times been sought, people have failed to see the input incorporated, and most times do not see efforts being made to obtain input or understand the departmental level business functions and information needs. (Note: frequent outside contracting was cited as the reason AIS does not have a better understanding of departmental level business functions and needs.) There are concerns that systems are built for central administration’s use, and decisions are being made which may be detrimental to the successful completion of the systems from the business unit perspective.

- CUFS is an example of central administration asking for opinions on unit requirements but not using the input; instead, politics pushed the completion date.

- Different campuses on different academic calendars is another example.

Problem: Some people feel that applications are not easy to use.

Solution: People want to have access to data with applications that are easy to use. People define “easy to use” as applications that you can use once a month and still find easy to use (i.e., no need for training and/or retraining), and applications that have a common interface across all forms of access.

Problem: Some people feel that systems staff should move to a more cost-effective environment.

Impact: Some people are concerned that staff in major systems units are not moving into object-oriented programming. Such a move could reduce development and maintenance costs as well as cycle time. I have a strong feeling that one of the reasons that things relating to technology do not work as well as we would like them to has to do with a lack of coordination of the underlying business rules...An example would be the fact that we have two registration systems, not one. We have a CEE registration system and a day school registration system and, accordingly, when we went into STARS (Student Accounts Receivable System) development project, one of the requirements was that we had to be able to receive data from both in an identical fashion; in spite of the fact that this was written in as a requirement, in fact it does not happen. And now that we have changed the refund process to meet a federal requirement, we find that day school and CEE are doing the refunds process differently. Neither of them is doing it perfectly, but the imperfections are not even the same in the two. That becomes an issue that makes the technological or information systems solutions expensive and much more difficult to maintain. That is just one small example....

I would second [the above quote] very near and dear to my heart...It causes about 2 weeks of extra work on my part because of the decision made...that is multiplied throughout the University. Once again, that is where someone should have been an information officer and said this will happen. My understanding is that AIS bid too high so Extension went outside the system and put their own on line because they thought the University...system was too expensive (and probably was), but someone needed to shoulder that and say we will give you the extra resources and it will be done. But nobody had that authority; somebody should have, there is no question. Now we are paying for that over and over and over again in so many ways.
Problem: Some participants see a major flaw in the amount of responsibility put on departments, with no authority and/or mechanism for on-line entry of documents into operational systems and/or the ability to transmit information across the network to complete a process/work flow.

Impact: Benefits include: routing of electronic documents, signatures, and verification; moving from one source to another which makes gathered data a lot more useful; and cutting down on duplication, paper, and double entry and "shadow" systems.

Solution: People would be very happy if central administration would state that it is committed to electronic forms processing (with signatures), work flow, and groupware—and presented some stated timelines. This would make a lot of people feel like they had been listened to. Also, it would eliminate duplication of effort as some units are now embarking on this for their internal administrative processes.

Some specific examples:
* people want to upload data to CUFS.
* people want on-line data entry for all documents.
* people want to be able to process grant proposals electronically.
* people want on-line forms processing.
* people want to be able to transmit graphics.

Problem: Some participants expressed concern that there is inadequate money for maintaining and/or upgrading some of the current operational (i.e., mainframe transaction) systems.

Impact: There is an associated cost to support and maintain systems; the systems have been freely developed without forethought (i.e., unplanned support, and shortage of maintenance funds).

Solution: The participants noted we need to plan and budget resources for ongoing support and maintenance of systems.

Some specific examples:
* the Human Resources systems are fragile and antiquated; they run outside of CUFS and still need to translate pre-CUFS general ledger accounts for personnel and payroll transactions to CUFS general ledger accounts.
* the student systems do not currently have the capacity to function in, and after, the year 2000. The current system does not allow for a 4-digit year; therefore, the difference between 1900 and 2000 will not be detected—the system will assume that 2000 is a date less than all dates between 1901 and 2000 because it can only compare the last two digits.
**Base Services: Information**

**Problem:** Some people currently do not have access to data they need to perform their job (including source data information as needed).

**Impact:** This includes data in any detail that users need, data that is currently not carried in the AIS reporting environment, and/or data that is currently collected but not maintained electronically.

One major informational database that is lacking is a unique person identifier for the University of Minnesota.

**Solution:** People want access to all the data they need to perform their job. People would like to see flexibility in security systems which can grant appropriate access to people; currently, it is almost impossible to know who to contact about getting access to data.

**Problem:** Some people feel that data may not be accurate, and may be used inconsistently (i.e., there are no consistent data definitions, and accessing data definitions and “in use” reporting examples is non-existent or difficult).

**Impact:** The most specific example here is in Payroll, Human Resources, and APSO data. Each area has different reporting needs, and it is very difficult for people using the same kinds of data to come up with the same head count—it varies based on which view of the data you use (i.e., Payroll, Human Resources, or APSO).

Also, there are so many caveats to the data that the data is always being qualified. Not all of this can be avoided, but people have to be aware and know what the information is that they are working with. The resources for helping to understand data definitions, source codes, uses, etc., are thus very important. If you don't ask the right person, you may not get all the information you need.

Furthermore, we are currently lacking a good data dictionary and sample reports for many of the systems. This makes it very difficult for people to be aware of and use the data and reporting that is currently available.

**Solution:** People expressed the need to ensure data integrity now and as we move to more distributed data entry points. People need easy access to accurate data, consistent data definitions, and “data in-use” reporting examples.

You can have data out there until you are blue in the face, but if it is not affordable or you can't get it out to the people that need it, it ...only benefits a small proportion of the people. It not only needs to be more available, but it needs to be affordable and user-friendly so that people can get at it...and they know what to do when they get there.
Problem: Some people are receiving too much unnecessary information.

Impact: Some people feel that they can’t keep up with the data. They are on information overload—too much of a good thing. There is more information, but no time to work with it.

You get so much information; it is a challenge to block out and filter what you do not need.

Support Services: Problem-resolution Services/Help Lines

Problem: Some participants stated that there is no such thing as a “one stop shop” here, and it is not clear who to call when you have a problem or need support, training, or access to data.

Impact: There is a low level of awareness about available services and data. This leads to waste through duplication of effort.

Problem: Some participants indicated that tools are available, but people are not sure which tools will work for the purposes needed in their department—and there is a lack of support in helping people determine this. The question was posed: “If you want a LAN, who makes that decision and how?”

Solution: People need to have support help to put together comprehensive requirements proposals for departments that want to add technology. This includes access to support and guidance on how to select tools to fit into the environment. There should be some support that walks you through your business functions and advises you on the LAN (i.e., the system, robustness, software, backup) that meets your departmental needs and estimates the budget needed to support it. No one is currently providing service on how to run a LAN—how to set one up, and install, run, and manage it. Small departments can’t afford their own LAN. AIS has started to get into this business and that is good; it is a real resource issue.

Problem: Some people cited specific problems working with some service providers.

Impact: It takes longer to get a phone connection here than at home. It takes six weeks for Telecomm to get anything in and another 8 weeks to get billed. Billing for enhancements to phones (i.e., voice mail) discourages people from using this form of technology. If a person needs a phone cord longer than 10 feet, they have to go outside the University to buy one. The Telecomm staff that do the phone installations do not know about information technology. People do not get their IP address (for access to the Internet) when a phone connection is being installed.

...there was no one there to help us with that [collegiate equipment and connections]. Either you got it right, or you spent a lot of money and got it wrong, and the chances were 50/50...there was no place we could really turn to for advice. We are where we need to be now and that is probably because we don’t know any better....

...[for us] there is no real plan to implement [equipment, connections to the ethernet, E-mail]...at the departmental level...There is no funding....

I have to give you one more [example of an area] that I don’t think is very well managed and expeditious, and that is Telecommunications (their interface with all the departments and with people trying to hook up to computers)...The idea of the new phone system was to support computing and it’s not doing [that]. It doesn’t work fast enough and the people [that] come out to install the phones don’t know anything about the computing part of it.
Problem: Additionally, some people feel that there is a lack of understanding at the University about what kind of support ratio is adequate.

Impact: Computing support staff (usually one person) support a lot more than 30 people (30:1 is industry standard) and are expected to know everything relating to departmental computing support. Adding to this, people feel that there is an expectation for departments to have their own support staff (which not all can afford) and that this expectation drives narrow-minded support from units that supply support to departments.

Support Services: Training

Problem: Some people stated that we need to do more than provide the technology.

Impact: We (the University) tend to provide the technology and then stop—no marketing, no support, no training.

Putting the hardware and software on the desk is not enough. There is a lot of hardware and software available to us at prices people can afford, but they need to know how to use it.

Problem: Some people do not have time to figure things out on their own; self-training is especially unfair to those in low paid positions.

Impact: People routinely perform “miracles” (often at the expense of their own time) to deliver results. Because the deliverable is accomplished, root problems (e.g., lack of training) are not addressed.

Problem: Technology is moving so fast that some people expressed concern and discomfort about being able to do the tasks at hand.

Impact: Once a tool is grasped, technology changes, and then you have to replace it and reach for the next tool in a relatively short time frame.

Some participants stated that lack of adequate training results in poor selection of useful tools and excessive staff time spent in learning how to apply these tools in their environment, as well as contributing to underutilization of existing services.

Solution: People want training to be addressed with technology advancements.
Problem: Some participants noted that the training that does exist is not sufficient.

Impact: A lot of training opportunities exist and staff need to spend more time on training to get the benefits. However, it is felt that existing training is lacking in making the transition from the classroom back to the departmental site. People do not know how to apply what they have learned back in their environment.

Solution: People need basic training to lay the foundation for later specialized training.

Policy/Guidelines

Problem: Some people expressed that, currently, there are no University-wide personnel policies relating to information technology.

Solution: People expressed the need to have personnel policies relating to information technology. When hiring new staff, there should be minimum competency testing (e.g., when hiring an accountant you need someone proficient in LOTUS, not someone who has just used it once). When people work away from the office (enabled by technology), we need policies addressing non V-class employees.

Problem: Some people also stated that, currently, there are no University-wide policies relating to information technology acquisitions.

Solution: People expressed the need for guidelines on when to put more money into equipment or put it into obsolescence, and guidelines for managing resources and upgrades. Some people never get rid of old equipment and try to build applications on this equipment.

Organizational Structure (central and other)

Problem: On support—some participants are not sure that central organization/support is the best way to provide assistance and services because of unfamiliarity with specific departmental business or needs. At the same time, single departments cannot handle the required support.

Impact: Support can’t be all centralized, but departments can’t do it all alone, either.

Solution: We need a consortia of departments that would hire a support person. If we could do this, it would get knowledgeable people in the right places.
Problem: On policy—some participants stated that it is not clear who is responsible, and for what.

Impact: Who is responsible for creating a culture where people are accountable for computer hardware, software, and data? Some departments have spent a lot of time recreating data that people have lost, and repurchasing hardware that people have ruined through carelessness. Many areas are exposed to risks of viruses, loss of data (i.e., no backup/recovery), and off-hours use of equipment.

Who is responsible for standards on technology management (e.g., personnel, resources, and upgrades)?

Solution: We need policies, we need to know who is accountable, and we need funding to match. There needs to be management of technology. Managers need to understand how tools fit into their units (i.e., function) and need to acknowledge that this is a component of the budget. Direction is needed from the top on setting budgets and where information technology fits into priorities.

Problem: On coordination of information technology—some people do not know what services are available and who supports each.

Impact: There is room for both (AIS & CIS)—the innovation of CIS, and the “do it right” and safety net of AIS. There are many players in this area; it is difficult to sort out who does what—and all play a crucial role.

Solution: Departments that need services need to know what each provider supports.

Problem: On funding—some people indicated that the current central technology model does not fit the distributed situation/environment.

Impact: Central administration gets the funding it needs, colleges do not. The expectations are confusing for departments in the sense of planning; central invents the processes but does not support with funds to implement; and more and more critical processes are being dispersed into departments, but the funding for this is not. There needs to be funding to match the applications that are developed in departments; central (and AIS) provide less and less support in this model.

Solution: People need coordination and a rational approach to how they should staff, how they should replace, and how they should maintain technology (i.e., an institutional standard is needed).
Problem: On guidance—some people noted that, currently, technology needs are mapped to central requirements, not to function or business needs.

Impact: Some areas need an A+ environment for their specialized needs, while others at the base need only an institutional standard (of technology) to address their mission.

Solution: People need guidance based on function, not based on central administration’s desires. Technology needs should be mapped to functions. People need to know where institutional standards can be set and deployed (e.g., a standard for business units, and a standard for clinical settings).

Problem: On control—some participants stated that, currently, decisions are based on who has the money, not on the benefits to the University as a whole.

Solution: People need some “stop point” to question the “good of the whole.” If the institution would make simpler requirements across all colleges, we would not have the problems and complications we have with some of our systems today.

Human Resources (reward, recognition, career path)

Problem: Some participants expressed how job classifications for information technology-related positions are out of date.

Solution: People would like to see job classification models in place, and up to date, for computer-related support positions.

Key Challenges and Next Steps

Find ways to be more efficient and effective in core administrative activities.

Challenges:
Some people see a challenge in doing more with less and replacing staff with information technology. People acknowledge that information technology will enable them to do more with less. It will allow for broader access, remote access, and possible reduction of staff. In certain departments, there is a strategic move to reduce staff via deployment of information technology—looking at where it might be cost-effective to replace staff/faculty, depending upon such factors as the area of expertise and/or number of students being served.
Most people see a challenge in doing things differently and increasing awareness and communication. Wherever possible, people want to deploy technology to increase communication and interaction with students, staff, and faculty, and also with external agencies/vendors. People also want to become more effective in terms of using information technology to change how they work.

Examples:
- student access to student administrative needs—empowering students to make their own decisions via technology
  - electronic dialogs for student advising
  - self-registration
  - student governance
- student access to instructional needs
  - interactive learning centers
  - long distance learning (courses are already in place; will expand the cost ratio base for numbers being served)
- E-mail to alumni, and correlating student activities to alumni/donor involvement (i.e., increases effectiveness in targeting donors)
- University-wide calendaring tool
- electronic data interfaces with external agencies and/or vendors (e.g., electronic claims processing, health care reforms)
- communicating externally what research the University has done (i.e., land grant mission)
- satellite and/or video conferencing
- more use of groupware: researchers at the University collaborating via information technology with other researchers—the possibilities are endless
- map information technology with work (i.e., function and not with technology) and increase data input methods to meet needs of function (e.g., voice recognition to cut down on cross contamination in health services fields—we are 5 years behind in this area)
- migration to Windows
- moving more things locally to the desktop, and learning more about hardware and software to do this effectively
- developing Computer Aided Design applications into curriculum and/or departmental business functions
- digitizing slide library
- sending and receiving graphics and images across the network (this is a whole new ball game for Telecomm)
- more LAN and client/server applications
- electronic forms processing
- increase in speed and capability of the network
- applications with common interfaces.

Some people see a challenge in doing things faster. People want to gear up for speed—being able to provide data quicker to decision makers. (This includes information on how to retain students, maintain quality, and target recruiting.) People see these pressures increasing and that there will not be a point of satisfaction. The more data and technology available, the greater the demand for application and use.
Next Steps:
Some people would like to see University administration at least state that it is committed to doing electronic forms, workflow, and groupware. People realize this cannot happen overnight but would like to know that it is coming. Departments would hold off on their own efforts if they knew the University is addressing this issue. A similar recent example is University-wide E-mail access; many departments had already invested time and money in their own E-mail systems and would not have done so if they had known a central solution was in progress.

Some people would like to know if a "disaster recovery solution" is coming. The University needs a standards for this. There is a lot of critical data in the departments. It worries staff that something might happen that will bring "dishonor" to the University.

Some people would like to see an electronic communications system where people are directed to go to get official and/or current information. Another example of this is to mandate that all staff members will use E-mail by some targeted date, or at least to promote E-mail (it was noted that people know how to send E-mail to the White House but not to President Hasselmo).

Develop appropriate policies, organization, and infrastructure—within the University and the broader community—to support the effective use of new technologies (e.g., telecommuting issues).

Challenges:
Some people see a challenge in evolving policies that keep up with impacts resulting from deployment of information technology. Telecommuting issues will grow significantly. Personnel policies currently do not address the accountability a department and an employee have when a laptop computer is issued. If the person is not on a V-class appointment, it is difficult to prove they did not work, and the department is accountable to pay. Also, this will dramatically impact the expansion of the work day.

Policies and/or career paths need to be developed to retain the people we have trained in our information technology environment.

Development of policies and budget for equipment maintenance and replacement are needed.

People need policies or guidelines on data responsibilities: security, retention, storage, backup, and recovery.

As information technology accelerated—and changes faster and faster—we need a broad-based kind of program to educate our staff and faculty. Faculty—if they are going to teach using a computer—need to be very comfortable with a computer. We are trying to educate....

...being able to retain what we have...is one of the bigger challenges. You get someone trained, then they go somewhere else for a bigger reward...Develop systems or policies to retain those people with that expertise.
Next Steps:

Overall, people would like honest and open communication (e.g., being kept informed of “things in the works.”) People would like to be able to make informed decisions.

Some people would like some central oversight, including decisions made on where the money is going to come from and where the money is going to go. People would like to get to a starting point.

Some people would like to see some type of prioritization process, where we tackle piece by piece those things we want to accomplish and begin to move forward. (People see current prioritization as those who have the money decide the priorities.) As things begin to happen and fall into place, there will be more confidence in the organization. People have spent many hours of planning for information technology and would like to see some payback in the form of “next steps.”

Some people would like to see funding readjusted to meet information technology needs, including money to maintain old/legacy systems.

A few people would like some guidance to promote “buying smart and hiring smart.” When we invest in major central systems, we need to hire people who have a full-time commitment to write system specifications. There needs to be better requests for proposal and requirements definitions from the start.

A few people would like to see funding provided to do “experimental type” things (e.g., on-line grant proposals, distance learning). The suggestion is to put forward an incentive to bring out good ideas—demonstration projects that help the University in general.

A few people would like to see AIS and CIS combined.

Support and manage departmental data repositories.

Challenge:

Some people see a challenge in managing departmental data repositories. With the increase in departmental LANs, applications, and systems, people recognize the challenge in managing their data repositories and security. People need to know what to keep, how much to keep, how to store, how to maintain, and how to access and use on demand.

Next Steps:

Some people would like to see a central clearinghouse which provides a comprehensive list of data/information that is available (e.g., standard types of information and reports). People keep "re-inventing the wheel.”

...the whole technology area needs to be supported with some really good business decisions.... That means there needs to be some community-wide decisions made about how the available capital is going to be invested, and what sort of trade-offs you make to define those key projects. You might need to have some high level business decisions that say to the whole community 'this is where we are going to invest the resources over the next one year, two years, five years'... you need a real focal point, a real direction as opposed to everybody trying to do everything; nobody has enough money, nobody has enough time, and nothing gets done well.

...we are talking about issues on how to renew our technology, the money for what we have...[and] I don't even have an adequate disaster recovery [process]. I am thinking 'we have got some real basics [to take care of] first...the more day to day survival kinds of things.'
Some people would like guidance in deciding what data to keep and how long it should be kept. People need policies on how and what to store (e.g., retention data), and on what security levels and backup procedures should be in place in the departmental computing environment. This is something that needs some planning and cannot happen overnight.

Some people would like to have central providers support data archival and retention. People see the need for some high speed network applications to support departmental data storage (retention data, archival, and backup). Departmentally stored data is pulled into some high storage area in the future (e.g., AIS). An infrastructure for supporting this in the future would be quite helpful.

Some people want archival, storage and retrieval of historical data.

**Keep up with rapid changes in information technology.**

**Challenges:**

*Some people see a challenge in having continual staff and faculty information technology support and training.*

Constant change is in everything, not just information technology. People are continuing to manage their workload while trying to stay abreast of all the technological changes.

Areas that have a University-wide responsibility to ensure that systems are properly controlled and operated have even a larger challenge—they have to keep up with everyone.

*A few people see a challenge in keeping up with daily tasks while information technology tasks enable “more to be done” (thus requiring more time).* Some people are spending more time on what they call “non work-related functions” (e.g., more time on PC applications, E-mail, calendaring) due to the existence of information technology, and some state they need more staff and more staff time to be able to accomplish all tasks.

**Next Step:**

*Some stability—a few people would like to stay in one place for some time.*

We just can’t stay on top of all the changes that are occurring. We have University-wide responsibility of making sure these systems are properly controlled and operated, yet there’s just so many changes taking place all at once, and everybody [is] kind of going their own way and doing their own thing, that it’s almost impossible for us to get these applications and review them to make sure they are properly controlled in an efficient manner.

How about settling down and staying in one place for a minute so you have some time to think? One more change in administration is one more—I can’t endure it.
Appendix 1

Background on Information Technology Planning Project

Senior University management created an Advisory Users Committee (AUC) in 1992, asking this committee to create a vision of computing and information technology for the University and offer some preliminary strategies for achieving that vision. The AUC vision states:

We envision an electronic environment, a common space, that invites members of the University community to make use of distributed information technology in realizing our land-grant mission. In addition we wish to involve members of the community at large in this collaboration. This environment will be tolerant of diverse computing platforms, provide access to global information resources, and will value innovation. (August 12, 1992)

The vision and strategy document received endorsement from the President’s Cabinet, the Senate Committee on Computing and Information Systems, and the University Senate. The AUC shared the vision with academic units and key University information technology personnel by placing it on Gopher and sending copies of it via campus mail.

To implement the vision, senior management chartered an Information Technology (InfoTech) Steering Committee which recommended an approach that focuses on establishing the linkage between the University’s strategic requirements and its ability to use information technology to address the needs of academic and administrative units. Specifically, the Steering Committee recommended a five-step process for implementing the vision and initiated the InfoTech Planning Project. The table below lists the five tasks and the current working status for each task.

<table>
<thead>
<tr>
<th>Task</th>
<th>Working Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review University strategic direction</td>
<td>The InfoTech Team is communicating with the University Planning Steering Committee to ensure that customer information technology needs align with the University mission.</td>
</tr>
<tr>
<td>Assess customer needs for information technology</td>
<td>The Customer Assessment Group formed as part of the InfoTech Planning Project is conducting the customer needs assessment now. Focus groups and reports are completed.</td>
</tr>
<tr>
<td>Assess existing information technology investments</td>
<td>The Provider Assessment Group formed as part of the InfoTech Planning Project is conducting the central and distributed provider assessment now. Focus groups are completed and reports are in progress.</td>
</tr>
<tr>
<td>Develop strategic information technology architecture</td>
<td>The InfoTech Steering Committee will select people to develop the information technology architecture after the customer and provider assessment is completed.</td>
</tr>
<tr>
<td>Develop tactical implementation plans</td>
<td>The InfoTech Steering Committee will select people to develop tactical implementation plans after the customer and provider assessment is completed.</td>
</tr>
</tbody>
</table>
Appendix 2

Customer Council

The InfoTech Planning Team decided to form and work with a customer council in order to obtain input from customers of information technology. The Customer Council consists of 150 individuals nominated by their college dean or chancellor (up to a total of 4 faculty, administrative staff, technical staff, and students) or central department head/director (up to 3 members). Customer Council members were invited to participate in the project through involvement in focus groups and through Council meetings.

A smaller (19 members) subset of the Council, the Customer Council Liaison Group, was more heavily involved with the project by providing suggestions for writing final reports and providing feedback on drafts.

Customer Council members came from the following colleges/campuses and units:

<table>
<thead>
<tr>
<th>Colleges/Campuses</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carlson School of Management</td>
<td>Academic Affairs/Minority Affairs</td>
</tr>
<tr>
<td>College of Agriculture</td>
<td>Administrative Information Services</td>
</tr>
<tr>
<td>College of Architecture &amp; Landscape Architecture</td>
<td>Admissions</td>
</tr>
<tr>
<td>College of Biological Sciences</td>
<td>Alumni Relations</td>
</tr>
<tr>
<td>College of Education</td>
<td>Audits</td>
</tr>
<tr>
<td>College of Human Ecology</td>
<td>Boynton Health Services/U Counseling Services</td>
</tr>
<tr>
<td>College of Liberal Arts</td>
<td>Business Services</td>
</tr>
<tr>
<td>College of Natural Resources</td>
<td>Campus Health &amp; Safety</td>
</tr>
<tr>
<td>College of Pharmacy</td>
<td>Campus Master Planning</td>
</tr>
<tr>
<td>College of Veterinary Medicine</td>
<td>Computing &amp; Information Technologies</td>
</tr>
<tr>
<td>Continuing Education &amp; Extension</td>
<td>Development Office</td>
</tr>
<tr>
<td>General College</td>
<td>Disabilities Serv./Disabled Student Cultural Ctr.</td>
</tr>
<tr>
<td>Graduate School</td>
<td>Equal Opportunity &amp; Affirmative Action</td>
</tr>
<tr>
<td>Humphrey Institute of Public Affairs</td>
<td>Facilities Management</td>
</tr>
<tr>
<td>Institute of Technology</td>
<td>General Counsel</td>
</tr>
<tr>
<td>Law School</td>
<td>Housing &amp; Food Services</td>
</tr>
<tr>
<td>Medical School</td>
<td>Human Resources</td>
</tr>
<tr>
<td>Minnesota Extension Service</td>
<td>Management Planning &amp; Information Services</td>
</tr>
<tr>
<td>School of Dentistry</td>
<td>Media Resources</td>
</tr>
<tr>
<td>School of Nursing</td>
<td>Minnesota Supercomputer Institute</td>
</tr>
<tr>
<td>School of Public Health</td>
<td>Office of International Education</td>
</tr>
<tr>
<td>University College</td>
<td>Printing Services</td>
</tr>
<tr>
<td>University of Minnesota, Crookston</td>
<td>Recreational Sports/Student Union</td>
</tr>
<tr>
<td>University of Minnesota, Duluth</td>
<td>Registrar</td>
</tr>
<tr>
<td>University of Minnesota, Morris</td>
<td>Research &amp; Technology Transfer Administration</td>
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<td></td>
<td>Student Financial Aid</td>
</tr>
<tr>
<td></td>
<td>Telecommunications</td>
</tr>
<tr>
<td></td>
<td>University Art Museum</td>
</tr>
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<td></td>
<td>University Hospital and Clinic</td>
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<td>University Libraries</td>
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<td>University Press</td>
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<td></td>
<td>University Relations</td>
</tr>
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<td></td>
<td>University Services</td>
</tr>
</tbody>
</table>

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Appendix 3

Description of Focus Group Process and Participation

Focus Group Methodology

An outside consultant, Marsha R. Mueller & Associates, was hired to moderate the focus groups. Mueller has a master's degree from the Department of Social Science, University of Chicago. Her skills include work in program quality assurance, policy analysis, program evaluation, applied research, adult education, strategic planning and group facilitation. Her professional background includes program management experience at The Pennsylvania State University and University of Illinois, along with research and evaluation work at the University of Minnesota.

A pilot focus group was conducted; some of the original focus group questions were changed based on this pilot. Focus group participants completed a pre-focus group survey which requested that they read the 1992 Advisory Users Committee (AUC) Vision and begin focusing thoughts on their information technology needs.

During each focus group, assistant moderators (Info Tech Planning Team members) took notes and tape recorded the session. After each focus group, assistant moderators collected the completed pre-focus group surveys, re-listened to the tapes, reviewed their notes, and created organized notes. The organized notes maintain confidentiality in informants' responses and include information from the pre-focus group surveys. The consultant provided feedback on all organized notes.

One team member then took the organized notes from a functional area (i.e., instruction, administration, student, research, or outreach) and drafted the report for that area, incorporating feedback from the consultant, InfoTech Planning Team members, and Customer Council Liaison Group members.

Focus Group Attendance

Some people attended more than one focus group. A total of 98 individuals participated in the focus group process. Focus groups were initially scheduled for the month of August, but scheduling was expanded through October 4 to accommodate faculty and students who were gone during the summer.

<table>
<thead>
<tr>
<th>Number of Focus Groups</th>
<th>Attendance</th>
<th>Surveys Collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>6</td>
<td>49</td>
</tr>
<tr>
<td>Instruction</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>Outreach</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>Research</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Student</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
<td><strong>119</strong></td>
</tr>
</tbody>
</table>

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Pre-Focus Group Survey and Focus Group Questions

Below is a condensed version of the pre-focus group survey and a list of the focus group questions. Marsha R. Mueller & Associates worked with the InfoTech Planning Team to develop the survey and questions.

Pre-Focus Group Survey

**Part I.** This part involves reacquainting yourself with the August 12, 1992 Vision and Strategy for Computing and Information technology. Please read the document carefully.

**Part II.** This part focuses on your current and anticipated information technology requirements.

**Current Requirements.** Think about your work and how information technology supports what you do. List the information technologies you count on now to support your work at the University. (Please be as specific as possible.)

**Future Requirements.** Think about how you anticipate your work will evolve over the next 5 years and what you expect to accomplish. In what ways will your information technology requirements change over the next 5 years?

**Future Requirements (students).** In what ways do you feel student requirements for information technologies will change over the next 5 years?

**Part III.** This part seeks your assessment of specific parts of the Vision and Strategy statement.

**For the vision statement**

- To what extent do you feel the vision statement is on target? (In other words, does the statement adequately reflect where information technology needs to be 5 years from now to support high quality, globally competitive work at the University?)
- What changes in the statement, if any, would you recommend? (Please describe.)

**For each of the six objectives in the vision statement, participants answered the following questions**

- How important is this objective in reaching the vision of information technology at the University?
- What changes, if any, are needed in this objective? (For example, is anything missing and/or should some parts be deleted?)
- Are there other objectives which you feel should be added to this list? (If so, please describe.)
Pre-Focus Group Survey and Focus Group Questions  
Page Two

For the Graphic Representation of The Commons
Please assess this visual by responding to the following questions:

(1) Is it clear to you what this visual is illustrating?

____ NO ______ YES⇒If yes, what does the visual represent to you? (please describe)

(2) Does this illustration adequately reflect the vision statement and objectives?

(3) In what ways should this illustration be modified or changed to communicate the vision statement and objectives? (Please describe or draw your recommended changes.)

Part IV. This part asks you to identify current information technology projects that you consider to be particularly innovative and/or interesting.

Please list any information technology projects (within or outside of the University) that you think are particularly innovative or interesting. The projects you list should be ones that you feel should be looked at for possible use at the University. In addition, briefly note the attributes of the project that make it innovative or interesting.

<table>
<thead>
<tr>
<th>PROJECT (Name/sponsor, brief description)</th>
<th>EXCITING ATTRIBUTES</th>
</tr>
</thead>
<tbody>
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</table>

Focus Group Interview Questions

Questions focusing on current work environment/information technology use

What does Information technology mean to you?

I would like you to think about the environment, or context, in which you do your work. If you're like most of us, there are factors in our work environment, factors more or less outside of our control, which can either enhance or limit our effectiveness. What are some of the key factors, or attributes, of your work environment that you feel significantly enhance the overall effectiveness of your work?

We've been discussing your current work environment. I would like to know more about how information technology fits into the work that you do. Tell me about the information technologies you consider to be essential to your work and how you use them.

Today information technology is supported and managed in different ways at the University.

• Based on your own experience, what works? What aspects of the current way information technologies are handled do you think are effective and should be maintained?

• What about factors which limit your effectiveness? What are some of the key factors of your work environment which limit the effectiveness of your work? What aspects of the current way information technologies are handled do you think are not working and should be changed?
Pre-Focus Group Survey and Focus Group Questions  
Page Three

Questions focusing on future requirements

All of you spent a substantial amount of time completing the pre-interview survey. One of the questions asked you to think about how you expect your work to evolve over the next 5 years and what you want to accomplish. One question in particular, asked how your information technology requirements will change.

• What do you see as key challenges in the next 2-4 years?
• In what ways will your information technology requirements change over the next 5 years?

Getting where you want to be 5 years from now means that progress must be made along the way. From your perspective, what must the University do in the short term, let’s say within the next 2-4 years, to enhance the likelihood that you'll meet your information technology requirements 5 years from now?

Questions focusing on vision/objective statements

I want to change topics somewhat for our final questions. Up to this point we've been discussing your current and future requirements. Before coming today you had an opportunity to re-read the vision and objectives statement.

What is your reaction to the vision statement? Based on how you see your requirements now and in the near future, does the statement make sense?

What was your reaction to the objectives? Are those the smart things to be doing if the University is to fulfill its vision? Should the objectives be changed in anyway? Is anything missing?

What is your reaction to the visual (i.e., of the Commons)? If you were the designer and decision maker, what would you include in the Commons and what would you exclude?

Can you tell me about any exciting projects that you are involved with or familiar with?

Do you have any final comments you would like to make about the future of information technologies at the University?
Appendix 5

Members of Information Technology Planning Project

Information Technology Planning Project Steering Committee

Tim Fitzpatrick, Administrative Information Services
Linda Jorn, College of Agriculture/Instructional Computing
Charlene Mason, University Libraries/Automated Systems
Mike O'Connor, Finance and Operations/Operations Development
Don Riley, Academic Affairs/Computing and Information Technologies
George Wilcox, Medical School and Supercomputer Institute

Information Technology Planning Project Team

Roberta Armstrong, Student Affairs Information Systems
Jodie Berg Combs, Administrative Information Services
Jim Colten, Computer and Information Services
Larry Dunn, University Networking Services
Judith Howe, Administrative Information Services and The Graduate School
Linda Jorn, College of Agriculture/Instructional Computing
Charlene Mason, University Libraries/Automated Systems
InfoTech Planning Project
Customer Needs Assessment

Instructional Summary

Prepared for:
InfoTech Planning Steering Committee
InfoTech Planning Customer Council Members
InfoTech Planning Provider Council Members

Prepared by:
Customer Assessment Group
InfoTech Planning Team
University of Minnesota

January, 1994
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<td>Purpose of this Document</td>
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<td>Focus Group Process</td>
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<td>About the Instructional Focus Groups</td>
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<td>What's Not Working?</td>
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<td>Key Challenges and Next Steps</td>
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<th>Appendices</th>
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<td>Appendix 2: Customer Council</td>
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<td>Appendix 3: Description of Focus Group Process and Participation</td>
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<td>Appendix 4: Pre-Focus Group Survey and Focus Group Questions</td>
<td>28</td>
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<tr>
<td>Appendix 5: Members of Information Technology Planning Project</td>
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</table>
Audience for and Purpose of this Document

Audience
This summary was prepared for the InfoTech Planning Steering Committee, Customer Council Members, Provider Council Members, and people who will be involved in the next step of the InfoTech Planning Project.

Purpose of this Document
This document provides a detailed summary of information that key informants about information technology at the University of Minnesota provided during instructional focus groups. The focus groups were conducted as part of the Information Technology Planning Project.

For readers who are not interested in the amount of detail provided in this document, a summary of major findings across all five functional focus groups (administration, instruction, outreach, research, and student) will be available early in 1994.

The following are provided in this document:

- a background section, which describes the Information Technology Planning Project,
- an executive summary, which highlights key findings, and
- a findings section, which details participants' focus group comments.

Read the findings section if you want to:

- understand and read about specific examples of how instructors are using information technology,
- learn what instructors think is working and is not working in terms of information technology,
- understand what instructors view as key information technology challenges and next steps the University should take in order to meet instructors' information technology needs,
- make informed budgetary and organizational decisions during your unit planning cycle in order to meet information technology challenges facing instructors, and/or
- improve current information technology services.

If you wish to acquire or read summary reports from the administrative, outreach, research, or student focus groups, or if you need the reports in alternative format, please contact:

Office of the Associate Vice President for Academic Affairs/
Academic Computing & Information Technologies
University of Minnesota
8 Morrill Hall—100 Church Street SE
Minneapolis, MN 55455
Telephone: (612) 626-9816.

Text of the reports also appears on the Internet Gopher. The path is:
\Home Gopher Server
\University of Minnesota Campus Information
\University Planning
\Information Technology Planning
\Customer Assessment Reports.
InfoTech Planning Project

Senior University management created the Advisory Users Committee (AUC) in 1992 and asked this committee to create a vision of computing and information technology for the University of Minnesota. In August, 1992, the AUC created a vision statement; senior management then chartered an Information Technology (InfoTech) Steering Committee which recommended a five-step planning process to implement the vision:

- review University strategic direction
- assess customer needs for information technology
- assess existing information technology investments
- develop strategic information technology architecture, and
- develop tactical implementation plans.

The InfoTech Steering Committee established the InfoTech Planning Team which has reviewed University strategic direction, assessed customer needs for information technology, and assessed existing information technology investments. Several documents have been created that report on customer needs for information technology and provide details on existing information technology investments. These reports will be distributed Winter Quarter 1994 and will help to guide decisions made in the next step of the Information Technology Planning Project. (See Appendix 1 for more background information on the Information Technology Planning Project.)

Purpose of Customer Needs Assessment

The customer needs assessment has two purposes: (1) validate the AUC vision with University units, and (2) assess University of Minnesota customers needs for information technology.

This information will help guide decisions made in the next step of the Information Technology Planning Project, and will also be shared with providers of information technology at the University for their planning use.

Customer Assessment Process

Key Informants. Key informants of information technology were nominated by their collegiate, campus, or unit administrator (see Appendix 2 for list of units) to form the Customer Council. Customer Council members attended meetings and participated in focus groups, and will fill out a survey (described below). A smaller (19 members) subset of the Council, the Customer Council Liaison Group, was more heavily involved with the project by offering suggestions for writing final reports and providing feedback on drafts.

Customer Council Meetings and Liaison Group Meetings. Customer Council members attended three meetings where they were informed about the planning process and listened to invited speakers discuss future information technology trends. Liaison Group Members attended several meetings where they provided feedback on draft reports and discussed the information technology planning process.

Focus Groups. Focus groups were conducted in order to validate the vision and assess customer needs (see below for further detail; a comprehensive description of the process and participation is also provided in Appendix 3).

Survey. Early Winter Quarter 1994, a survey of the Customer and Provider Councils will be conducted that will produce ratings to be used in developing a ranking of steps the University should take in the next 18-24 months to meet customers needs for information technology.
Focus Group Purpose

The purposes of the focus groups were to:

• understand users' current work environment and information technology use as well as their future information technology requirements
• understand information technology users' reaction to the AUC vision, and
• obtain a list of exciting information technology projects.

Focus Group Process

There were 21 focus groups conducted from August through October, 1993. An outside consultant was hired with skills in strategic planning and focus group facilitation to moderate the focus groups (see Appendix 3 for further consultant credentials). Key informants self-selected into the following functional roles and attended corresponding focus groups: administration, instruction, outreach, research, and student.

Focus group participants completed a pre-focus group survey and answered a set of common questions during the focus groups. (See Appendix 4 for pre-focus group survey and focus group questions.) The InfoTech Planning Team members conducted a rigorous, reiterative process for synthesizing data from the focus groups. (As noted above, Appendix 3 provides more detail on this process.)

About the Instructional Focus Groups

There were three instructional focus groups conducted during August and September, 1993. Eleven surveys were collected from a total of 18 participants.

Participants were articulate and appreciative of the opportunity to be heard; several exchanged business cards in order to continue the conversations initiated in the focus groups. Responses included individual participant replies to moderator-initiated questions and group-generated discussion. Attendees represented a broad spectrum of individuals: faculty (8), administrative (3), computer support (6), and librarian (1).

Future Reports

One other customer assessment report has been written and is being sent to Customer and Provider Council members, administrators who nominated Customer Council members, the Senate Committee on Computing and Information Systems, and the President’s Cabinet. This report summarizes major findings across all five functional focus groups. Additional copies of the report will be available early in 1994.

A concurrent assessment of existing University information technology investments is being conducted and a report on these findings will be available early in 1994. Lastly, a report which combines customer and provider assessment summaries will also be available early in 1994.
Executive Summary

This section highlights the key findings for the instructional focus groups, and is structured so as to provide an outline of the findings section.

How Participants Talk About & Use Information Technology

- Participants defined information technology in different ways.
- Instructors indicated that information technology is highly integrated into their work environment.
- Instructors find they need to work closely with providers of information technology to successfully integrate information technology into instruction.
- Instructors use technology to gain knowledge and access information.
- Instructors use technology to enhance their effectiveness as instructors and bring innovative teaching methods into the classroom.
- Instructors use technology to communicate with students and collaborate with colleagues around the world.
- Instructors use technology to accommodate the instructional needs of commuter students and students who cannot meet with instructors from 8:00 AM to 5:00 PM.
- Instructors use technology beyond the traditional way we define instructional computing.

What's Working Now? What's Not Working Now?

We asked participants what is working and what is not working in terms of how they use information technology. Participant comments covered a wide range of ideas and experiences and stated high expectations. It was clear in all focus groups that people often could not talk about what is working without talking about what is not working. Participant comments from all focus groups—administrative, instructional, outreach, research, and student—tended to fall into five general categories: 1) Base Services—Network/Access, Hardware, Applications & Information; 2) Support Services—Reliability, Problem-resolution Services, Training; 3) Policy/Guidelines; 4) Organizational Structure (central and others); and 5) Human Resources.

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<tr>
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<tbody>
<tr>
<td></td>
<td>E-mail addresses for all students, staff and faculty</td>
<td>Lack of classrooms wired for E-mail</td>
<td>Facilitates communication</td>
</tr>
<tr>
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<tr>
<td></td>
<td>Support of multiplatforms</td>
<td>Under-utilization of hardware due to lack of training on how to use it</td>
<td>Facilitates acquisition of hardware for people and departments</td>
</tr>
<tr>
<td></td>
<td>Bookstore computer and software prices</td>
<td>Carelessness about virus infections</td>
<td>Ensures that faculty use the information technology that is available to them</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increased costs and increased levels of support associated with diverse platforms</td>
<td>Ensures that hardware is in working condition</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ensures that users do not experience frustration due to lack of support or money</td>
</tr>
<tr>
<td>Support Services: Reliability</td>
<td>Reliable services: LUMINA, infrastructure support, and the network</td>
<td></td>
<td>Comforts those that are new to technology</td>
</tr>
<tr>
<td>Support services: Problem-resolution</td>
<td>Microcomputer Group's Help Line and computer demonstration lab</td>
<td>Lack of support for developing instructional software</td>
<td>Ensures that users can talk with someone who understands the technology at the users' level of understanding</td>
</tr>
<tr>
<td></td>
<td>Some central departments and some college departments provide support for development of software, but the demand is high and resources are stretched thin</td>
<td></td>
<td>Allows instructors to focus on pedagogical issues, instead of focusing time on learning programming</td>
</tr>
<tr>
<td>Support Services: Training</td>
<td>Participants provided specific examples of what individual departments/units do to train faculty, students, staff, and people outside of the University</td>
<td>Inadequate support or training resources to keep up with the diverse needs and demands of users as they work to keep up with the rapid changes in technology</td>
<td>Allows departments and units to re-educate faculty, students, and the public on how to access and use information</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ensures available technologies are used</td>
</tr>
<tr>
<td></td>
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<td>Allows instructors to keep up with the rapid change in technologies</td>
</tr>
<tr>
<td>Policy/ Guidelines</td>
<td>What’s working now?</td>
<td>What’s not working?</td>
<td>Impact on Instructional Computing</td>
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<td>Elimination of computer lab fee on the Twin Cities Campus</td>
<td>Curriculum development and course credit policies do not accommodate rapidly changing technologies</td>
<td>Supports instructional computing (e.g., supports acquisition of hardware, facilitates communication, allows development of courseware, etc.)</td>
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<td>Bookstore sales of computer hardware and software at low prices and advertisement of this in <em>The Minnesota Daily</em></td>
<td>Current funding strategies are insufficient for new acquisitions, replacement, development costs, and support staff</td>
<td>Bookstore sales provide an incentive for using the technology</td>
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<td>Instructional improvement fund allowed one person to equip a classroom with computers</td>
<td>Current funding strategies are creating a class of &quot;haves&quot; and &quot;have-nots&quot; in terms of information technology</td>
<td>Supports new teaching methods</td>
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<td>One institute was generous in providing money for hardware and software for a new instructional lab</td>
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**Organizational Structure (central and other)**

<table>
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<tr>
<th></th>
<th>Distributed computing</th>
<th>Lack of formalized structure for people to meet and share ideas about information technology</th>
<th>Decrease departments’ reliance on central units for computer support</th>
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<td>Central providers need to plan a series of market activities that convince users that technology will be useful</td>
<td>Decreases learning curve that is associated with new technologies</td>
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<td>Leaders need to make decisions and initiate action based on users’ needs</td>
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**Human Resources (reward, recognition, career path)**

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<th></th>
<th>No examples provided</th>
<th>Lack of credit, e.g., release time or tenure consideration, for the development of courseware or the innovative use of technology in the classroom</th>
<th>Encourages and provides incentives for instructors to develop instructional technologies and develop new, innovative teaching methods</th>
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### Key Challenges and Next Steps

Several key challenges surfaced when participants were asked to discuss future key challenges the University needs to address in the next 2-4 years in order to meet users' information technology needs. Participants also noted next steps that the University could take in order to meet these challenges. The identified key challenges and suggested next steps are listed below.

<table>
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<tr>
<th>Key Challenges</th>
<th>Next Steps</th>
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| Find ways to be more efficient and effective in core instructional activities. | • provide courses and degrees without requiring a physical presence in the classroom  
  • provide universal access to the network  
  • provide broader access to administrative information via computer as opposed to phone or paper. |
| Demonstrate a commitment to instructional technologies.                       | • provide a policy that allows faculty release time to learn about new technologies and how technologies will change the way they teach  
  • provide incentives for innovation  
  • provide ongoing support for users of new technology  
  • evaluate current funding models  
  • provide funding models in this time of decreasing resources that support recurring costs of computers  
  • provide strong leadership  
  • develop partnerships and collaborate with the private sector in order to raise money "to make things happen"  
  • convince constituents outside of the University that the InfoTech Planning Process is needed. |
| Keep up with the rapid changes in information technology.                     | • encourage people to share expertise and reward them for it  
  • provide support to re-educate users on how to use rapidly changing technologies  
  • inform students that rapid change will be part of their professional lives and provide them with the skills to adapt to change. |
### Key Challenges
Focus on providing technologies that are shaping future learning environments.

### Next Steps
- provide guidelines for applications and platforms the University will support
- provide incentives for meeting University guidelines, while still encouraging innovation
- when deciding on future investments in technology, look at the detailed examples of the type of hardware and software that participants want in their future learning environments
- enhance the quality/effectiveness of available support services and training.

(At the end of one focus group there was agreement among all participants that a new instructional paradigm shift needs to be emphasized in the vision. This paradigm shift includes meeting the needs of our diverse students (e.g., commuters and part-time students), facilitating global connections, and focusing on the land grant mission. People agreed during the focus group that the next steps that had been discussed would help instructors implement this new instructional paradigm.)
Findings

The Findings section in this document is divided into three categories:

**How Participants Talk About & Use Information Technology**
This section describes how participants define information technology and how they use it in their work. Focus group participants provided many examples demonstrating that information technology is supporting the University's mission.

**What is Working Now and What is Not Working?**
This section contains participant views on which aspects of information technology at the University work well and which do not work well. Participants frequently identified aspects of information technology as both working and not working. For example, some participants stated the network works quite well, while others stated the network is not truly effective because it is inaccessible from too many places.

**Key Challenges and Next Steps**
This section describes what participants discussed as key challenges for meeting their information technology requirements. Also listed are next steps that participants stated the University should implement in order to enhance the likelihood that their information technology requirements would be met.

Note: In this section of the document, the words "few," "some," and "most" have been used in order to help the reader understand how many people discussed an idea or made a comment during the focus group sessions. The word "few" means that the idea was discussed or comments were made in one focus group, "some" means in two focus groups, and "most" means in three or more focus groups. Material in *italics* is quoted information from the focus group sessions.

**How Participants Talk About & Use Information Technology**

Participants defined information technology in different ways.

A consistent definition did not emerge from the discussion. Some common themes did occur, as participants stated that information technology included:

- information
- communication
- hardware—communication technologies, CD-ROMs access via keyboards, TV, telephones, video
- applications—E-mail, databases
- infrastructure.

A few participants discussed the ambiguous use of the terms information technology and computing in the vision statement.
Instructors indicated that information technology is highly integrated into their work environment.

When asked "What are critical technologies?" most participants could not just list critical technologies, but needed to talk about how and why technologies were used and needed.

Most participants consistently stated in a very quick fashion the truly indispensable thing is word processing; I can't function without it. the basic information technology tools that they need. These consist of: LUMINA, word processing, spreadsheets, online databases, and E-mail. One person listed Don Riley (Associate Vice President for Academic Affairs with special responsibility for Academic Computing and Information Technologies) as a critical technology.

Instructors provided detailed examples of information technology that they use:

Databases/Information: LEXIS, Westlaw, Gopher, alumni information, LUMINA (public and staff modes), other University libraries, PALS, Legislate, FirstSearch, RLIN, Dialog, Datanet, CD-ROM (numeric data and text), bibliographic databases (private), personal databases of literature

Tools for Accessing Information: On-line searching via modem, choices from Public Access screen, Internet LISTSERV, subscription/membership to bulletin boards, institutional data access, net-news, mature local area network (LAN)-based computing, mature Internet access (Gopher, archive servers, information servers, libraries, etc.), POPmail, LAN (Appletalk), ARA, FTP, public labs with network access, applejack, etherjack, networking infrastructure-LANMARK, bibliographic searches, phone system, fax, networks (Novell, TCP/IP, Appletalk, Ether­talk, T1 link, etc.), DOS & Mac, UNIX (file service, E-mail, many other services), access to networks in the college classroom

People need to access the Administrative Information Services (AIS) student record database on a daily basis.

Computer Classrooms and Visualization Technology: RGB projector, LCD displays and overhead, ability to project GUI interfaces in the classroom, graphics, access to networks in the college classroom, film recorder, classrooms with AV equipment, televised classes, AV equipment, video (conferences and classes, T1 link)

I count on fast graphics processing for visualization.
Instructors find they need to work closely with providers of information technology to successfully integrate information technology into instruction.

Re-education. Most participants stated that they need to continually re-educate themselves about how to use technologies and mentioned the following resources for accomplishing this: Micro Group newsletters, support classes/seminars on networking, handouts on computing/networking, Help Line, and co-workers.

Financial Support. Participants discussed how colleges and departments are funding computer resources (costs associated with building new labs, obtaining services, purchasing site licenses, providing support personnel, and setting up and maintaining hardware).

Instructors use technology to gain knowledge and access information.

Most participants could provide examples of how instructors use Gopher, Current Contents, and the Internet to gain knowledge and access information. Participants discussed how they research databases, access networks with alumni information, use bibliographic databases, and search book and periodical information on-line.

Instructors use technology beyond the traditional way we define instructional computing.

A few faculty are interested in using computers to advise students and to support students in designing their curriculum. A few departments think there are things that could help students reflect, analyze sources of instruction, and design their curriculum. These departments are evaluating how they can deliver this information, via technology, to students and faculty.

Instructors use technology to communicate with students and collaborate with colleagues around the world.

Some instructors use E-mail and Gopher for assignments. One instructor noted the setting up of class E-mail groups; the first assignment is to send E-mail messages so that students get over the initial hurdle of communicating via E-mail. Faculty communicate with colleagues around the world by belonging to international E-mail LISTSERV conferences.

...help faculty to become aware of how to use technology in the class. It is a very important tool in the immediate future.

...The next step is Gopher—to make information available. The connection to the network is the most important part of what we do. Many departments need local access, and don’t care about the Internet... personally, I don’t think we can live without it.

One way to think of instructional computing is academic support.

...We want to eventually teach nationwide. The only way to do this is to use experts from across the country. The Internet and E-mail set the stage for this kind of communication to take place; there are some really exciting possibilities.
Instructors use technology to accommodate the instructional needs of commuter students and students who cannot meet with instructors from 8:00 AM to 5:00 PM.

Instructors in some courses have started using E-mail and Gopher to support instruction and to let students interact with each other. Many students are not on campus a lot, so as much relevant information as possible is placed on Gopher. Instructors are finding that students use this system a lot from 10 PM to 2 AM.

Students absolutely have to be able to do at home whatever they can do at school.

Instructors use technology to enhance their effectiveness as instructors and bring innovative teaching methods into the classroom.

A few faculty discussed how they use active learning in the classroom, how they no longer think of the classroom as a room with four walls, and how they no longer think of students as having to be physically present in the classroom.

We set up a Gopher server in Norway and here. As a first step, we will pass off projects between studio classes here and in Norway. We use computers to facilitate the whole thing. Our discipline has a technical, artistic, and cultural aspect. Having students from different nations work with all these aspects is a very interesting and exciting thing. To see, analyze, and understand what people with different backgrounds do to a given project is all facilitated by global communications.

For some instructors this involves using technology as tools that allow them to present information in new ways and that allow students to work together. A few people discussed authoring tools that allowed instructors to animate processes for students. One faculty member discussed use of the computer in class every day to present information, provide students with feedback on their progress, perform experiments, and support group problem-solving.

The new computer lab I’m expecting will become indispensable as a way of bringing real language into the classroom in a way that a teacher or even a videotape alone cannot do. We can provide random access material on a video disc or provide a more individualized way of accessing material, and provide the kind of help and feedback that students can comprehend.

[I] look at all the things in my life that have changed, and every time I get up and hold a piece of chalk in my hand at the blackboard I think ‘gosh, I’m doing something wrong here!”

What’s Working Now? What’s Not Working?

Participants were asked to explain what is working and what is not working in terms of how they use information technology. Participant comments covered a wide range of ideas and experiences and stated high expectations. It was clear in all focus groups that people often could not talk about what is working without talking about what is not working. In this section, comments on what is working and what is not working are presented separately, simply for ease in reporting data.
Participant comments from all focus groups—administrative, instructional, outreach, research, and student—tended to fall into five general categories:

1. Base Services
   • Network/Access
   • Hardware
   • Applications & Information

2. Support Services
   • Reliability
   • Problem-resolution Services
   • Training

3. Policy/Guidelines

4. Organizational Structure (central and others)

5. Human Resources.

The following two sections detail what participants in the instructional focus groups think is working or not working. We have organized participant comments under the five general categories listed above.

What’s Working Now?

Base Services: Network/Access

Some people noted that the network structure, public labs (including the terminals set up for communication in the public labs), and E-mail addresses for all students, staff, and faculty work well. Regarding networking, the provision for every student, faculty and staff with an E-mail address was a pretty bold thing to do.

Base Services: Hardware

One person noted that we are ahead of other places in that we support multiple platforms. Most people noted that the Bookstore computer and software prices facilitated the acquisition of hardware for many people and departments. We are ahead of other places in supporting multiple platforms.

Base Services: Applications & Information

Some people noted that access to different applications and information is facilitating communication and instruction. ....a big step this year is that students can access my server, which contains instructional material, from any lab on campus—and it's free!

A few participants discussed that LUMINA, Gopher, on-line discussion groups such as net-news, and public access to on-line student grades and credits that will evolve into self registration all worked well. The [on line] discussion groups are useful and rock solid, and get people involved.

LUMINA is top notch.

It [Gopher] has brought a good reputation to the University of Minnesota that we can leverage.
Support Services: Reliability

Some participants discussed reliability in terms of:

- reliable services, such as LUMINA;
- reliable hardware; and
- reliable infrastructure support.

Some people stated that the network is reliable.

On our original request for proposals for LUMINA a key factor was reliability. As we come to rely on it as part of our daily work, it's gratifying that it is down for only 10 minutes every 3 weeks. Historically, other systems were down for 4 days.

The machines themselves are reliable and that is comforting to those of us who are new to technology and a little distrustful.

Support Services: Problem-resolution Services

Most members of the focus groups stated that some central units and college departments have support for development of software, but that the demand is high so the resources are stretched thin. Members noted that the Micro Group's Help Line and computer demonstration lab are useful.

We recently hired someone to help us. It's been a wonderful experience. You can explain the situation in a way that you understand, and the person responds at your level.

Support Services: Training

A few participants provided several specific solutions they have implemented in order to help re-educate faculty, students, and the public on how to access and use information.

- In one discipline, there is a person who is responsible for CD collections of government information. (The CDs have text and numerical data that support classroom activities.) This support person works with faculty/students/members to assist them in accessing and using this data.
- In another college, one person provides support for a large number of workstations that supplement class work. This facility is available 16 hours per day.

Policy/Guidelines

Most participants shared several specific examples of policies and guidelines that have supported instructional computing. Most people noted the following:

- Elimination of computer lab fee on the Twin Cities Campus (Duluth still has a $60 fee for students who use the computer); and
- Bookstore sales of computer hardware and software at low prices and advertisement of this in The Minnesota Daily.

If it wasn't for the discount on computers, I wouldn't have one on my desk. The list provided by Distributed Computing Services is helpful and gives me an incentive to use the technology.

One person noted that although money was tight, an instructional improvement fund allowed them to equip a classroom with computers. Another person noted that their institute was generous in providing money for a new instructional lab—hardware and software.
Organizational Structure (central and other)

Most participants noted that distributed computing works. One person described how their college has its own infrastructure, computer director, and lab and doesn’t rely on or get much support from the University.

Human Resources (reward, recognition, career path)

Participants in instructional focus groups did not have any examples of career path, rewards, and/or recognition models that are effective for the support of instructional computing.

What’s Not Working?

This section provides specific examples and quotes from participants that describe what is not working with information technology at the University of Minnesota. Once again, it was clear that people could not just talk about technology—they needed to talk about what is not working in terms of how this impacts their work. The following quote provides an example of how people talk about the orchestration of reliability, support, and organizational issues when they talk about using technology:

[The] trend for many departments is to have localized services. This seems to work best to meet specific departmental needs. Each department does have specific needs, and it’s hard to rely on one center to provide all these services. It’s more work for the departments; the amount depends on what services they support....and it’s a problem because not every department can afford to have someone to support all the needs and understand all the details involved....so support is becoming a problem.

Base Services: Network/Access

A few people noted that they were limited in terms of instructional computing because not enough classrooms are wired for E-mail.

Base Services: Hardware

Some participants talked about under-utilization of hardware due to lack of training on how to use it.

A few people discussed complacency about viruses, stating that users have become “flippant” about infections that can wipe out systems.

A few participants discussed problems associated with the notion of diversity of platforms. One person noted that increased diversity in platforms requires increased support which increases costs, and one person noted that diversity increases the chances of experiencing frustration. Another person noted that the University of Minnesota-Duluth decided to be more selective and focused on quality rather than diversity, and that some of these decisions were driven by monetary considerations.

Do we want [can we afford] multiple platforms and operating systems within a broad range of standards? Why not pick and choose carefully, and focus on quality rather than many platforms?

Do we want diverse platforms? To value innovation is OK, but how do we safely test and implement it? Are we a production or experimental [environment]?
Base Services: Applications/Information

Some people talked about the difficulty in using certain applications. People noted that Gopher and the Public Access Menu can be reached from many locations but it is difficult to find information; also, there is a big learning curve when accessing data resources on the AIS mainframe. Some instructors also stated that they need to easily access student information for advising purposes.

A few people had concerns about security issues in relationship to distributed computing. A few participants also noted that central authentication issues needed to be addressed so that people do not have so many passwords.

Some people want to decrease reliance on paper, such as budget forms. They want these forms on-line.

Support Services: Problem-resolution Services

Most participants noted that they need support in developing instructional software. A few faculty are concerned that information technology will end up taking more time to develop and use than current methods of teaching.

Support Services: Training

Some participants noted that users need to be continually re-educated on how to use technology. In fact, people noted that some facilities are not used because people do not know how to use them.

Some participants also noted that current support or training resources do not keep up with the diverse needs and demands of users as they work to keep up with the rapid changes in technology. One distributed provider noted how hard it is to keep up with the rapid changes in technology.

If the goal is to make the technology available to the entire University community, I think there are still people who do not know that this actually can do something for them...they need to be sold that this will be of value to them in their work.

[Our] institute was generous with equipment; staff is another matter.

...All the money in the world spent on hardware and software means nothing without a capable, experienced, and happy staff.
Policy/Guidelines

Most participants provided examples of current policies which create situations that do not support instructional computing. For example:

- Curriculum development and course credit policies do not accommodate rapidly changing technologies which provide faculty the opportunity to change their teaching methods. (E.g., one instructor wants to teach “small, bite-sized chunks” on Computer Aided Design from the time students enter the program to when they leave; however, this approach wasn't supported because if students can't register for the course, the department can't charge for it.)

- Current funding strategies are insufficient for new acquisitions, replacement, development costs, and support staff. Participants noted that researchers bring in grants to support research, but that it is hard to bring in grants for teaching. Other participants noted that some colleges get funding for labs, such as Woksape, but when this money runs out, some departments cannot continue funding the labs.

- Current funding strategies are creating a class of “haves” and “have-nots” in terms of information technology. One person discussed how some departments cannot fund new equipment so people use old machines with old versions of software for word processing, but they cannot use these old machines to access the network.

Teaching methods change. You use software one way this year, and over the summer someone does some research and says "guess what we can do with this thing that we have never done before." So even if software and hardware wouldn't change the method we use in teaching, the application in teaching could very well change. Teaching methods need to be updated, as well as learning 7.0 vs. 7.1 as an operating system.

Financial support, of course, is always an issue. Ethernet speeds would be expanded into all offices and classrooms, but you need to have it installed and maintained; the fact is that departments are hard pressed with cutbacks and all, and for good speeds it's generally pretty expensive for departments to be hooked up to the backbone or the Internet, unless research funding will supply it.

They need to expand central funding for central support. If they push for technology to create changes, we need support to keep up with changes.

Organizational Structure (central and other)

Most participants indicated that there are several organizational issues that could be changed in order to better support instructional computing. They offered several suggestions for changes:

- The University needs to provide a structure for people to meet and share ideas about information technology.
- Central providers need to plan a series of marketing activities in order to convince users that technology will be useful.
- The University needs to market from the top down—decide what users want, then offer support to do this. People want strong leadership which they defined as leaders who make decisions and initiate action.

I would like to see something from administration that supported bringing together people from various departments, to encourage linkages using information technology.....I would like to support campus-wide generation of groups to discuss these things and come up with projects.

When people see an announcement that such and such is available, they don't have an idea of what that may do for them. That may be a salesmanship process that needs to be taken more seriously.

Human Resources (reward, recognition, career path)

A few participants indicated that faculty should get credit (e.g., release time or tenure consideration) for the development of courseware or the innovative use of technology in the classroom. People noted that department chairs and faculty need to initiate this.

One of the big issues is how teaching is viewed on campus....Until teaching is elevated to equal status with research, I don't [think] instructional computing will be elevated to equal status; it won't get the resources, and it won't be done in a coordinated way.
Key Challenges and Next Steps

Several key challenges surfaced when participants were asked to discuss future key challenges the University needs to address in the next 2-4 years in order to meet users' information technology needs. Participants also noted next steps that the University could take in order to meet these challenges. The key challenges are listed below; next steps appear under each challenge.

### Key Challenge: Find ways to be more efficient and effective in core instructional activities.

**Next Steps:**

**Provide courses and degrees without requiring a physical presence in the classroom.** Some instructors stated that we need to serve learners wherever they are, e.g., at home, work, or in their community. We need to provide students at remote sites the ability to access instructional materials.

I see a more complete use of [E-mail, Gopher, LUMINA, and AIS Student Record Data Bases] within an expanded ‘classroom.’ My goal is to eliminate physical location as a criteria [stet] for obtaining knowledge and taking coursework. I would like to use information technologies to have national and international experts efficiently share their expertise with learners of all types.

Over the next 2 years, one of the most important things that needs to happen is to give everyone on campus access to the Internet because that is where everything is happening.... We are on the right track, but there are a lot of departments that still don’t have access. It’s a matter of getting everyone access, and once we have that up and running, then we can look at the other options of what all we should give access to and where to go. Unless we have access for everyone, then it is such a select group that somehow has funds to access resources.

...all of the huge tons of papers that cross our desk—much of which I only scan or discard or route—could be routed electronically...

**Provide universal access to the network.** Some participants discussed the great potential E-mail has for teaching and for accessing work units’ collections of information, e.g. information on CD-ROMs.

**Provide broader access to administrative information via computer as opposed to via phone or paper.** A few participants noted they wanted to decrease their reliance on paper. They suggested that the University needs to work on eliminating paper by placing redundant forms (e.g., budget forms) on-line.

...all of the huge tons of papers that cross our desk—much of which I only scan or discard or route—could be routed electronically...
Key Challenge: Demonstrate a commitment to instructional technologies.

Participants noted that the University can meet this challenge by developing appropriate policies, organizational models, financial resources, and infrastructure to support instructional technologies and by working with constituents outside of the University.

Next Steps:

Provide a policy that allows faculty release time to learn about new technologies and how technologies will change the way they teach. Some instructors discussed how they want release time to learn how to use new technologies in the classroom and to re-design their courses. Instructors discussed how if they want to do something, their work turns into a 125% commitment, and they can’t do this long term. Others discussed how they worked all summer to get ready for Fall Quarter.

Provide incentives for innovation. Innovation has to start with the faculty member. Some people discussed the possibility of the University providing requests for proposals that would grant money to faculty who demonstrate a strong commitment to the successful use of instructional technology.

Provide ongoing support for users of new technology. Some participants noted that people are a valuable resource and can be “upgraded” to do what they want to do. People need to be re-educated. Some people stated that units should provide support staff so that faculty do not spend their time maintaining the technology.

One person noted that we should train people about the concepts, as well as the specific techniques, for using databases.

If you’re going to transcend from the chalk technology to using interactive video between remote sites, you’ve got to change the way that you’re going to be teaching.... We need faculty release time in order to learn how to do that and get into these other types of technologies. You have to tailor it to your class.

There is a grant issue itself. If central information technology administration had University-wide grants, we could take advantage of this. It’s difficult in my position to go out and try and get a $300,000 grant to get money to improve instructional computing, whereas I’d hope it would be easier to do on a University-wide basis. What’s happening in [my college] is that instructional funding is disappearing. The money that I see to improve our undergraduate labs is gone for the next 2 years. We would use the money to build new labs, continue maintenance of hardware, and upgrade software.

Some level of assistance must be available outside of regular business hours. The “Gateway” is almost always open; help must be there.

On a campus this size, it is a slow and long process to educate everyone. Department heads need to decide this is important and educate staff to support the technology. Technology changes; you learn one thing, then need to re-educate on a regular basis. Individual subunits need to address individual unit needs, but they need money and time to keep up with developments.

Often faculty take on the responsibility of maintaining networks—this happens a lot.
Evaluate current funding models. Some people noted that money is always an ongoing issue and that faculty need to spark the interest of deans and department heads to let them know that computers are an important aspect of their job.

Provide funding models in this time of decreasing resources to support the recurring costs of computers. A few people suggested that the administration and department heads need to have a paradigm shift in the way they think about funding technology. Computers don't last for 25 years like tables and chairs.

Provide strong leadership. Most participants noted that they want strong leadership which they defined as leaders who make decisions and initiate action.

A few participants stated that they want to see a tangible product from this stage of the planning process and the demonstration of results by taking a series of action steps. Some people noted that a lot of planning has happened over the years, and maybe it's time to act on a few things.

Develop partnerships and collaborate with the private sector in order to raise money to make things happen. One person suggested (and others agreed) that the University should provide a grant writing center that would contact computer companies about developing partnerships to benefit both the companies and the University. There was a notion that there needs to be a group to write grants for equipment. One person noted we should enlist various worldwide standards groups to express our needs.

Convince constituents outside of the University that the InfoTech Planning Process is needed. One person noted that in order to meet the University's information technology needs, we need money and therefore need to convince the legislature that information technology is important.
**Key Challenge: Keep up with the rapid changes in information technology.**
Administration should understand that technology is moving fast and faculty must have help in learning about the changes.

**Next Steps:**

**Encourage people to share expertise and reward them for it.** Some participants noted that we tend to be very isolated and individualistic about sharing expertise, and we do a poor job of communicating, sharing information, and presenting possibilities. They noted that information technology is hard to sell if it’s perceived as more work, at least in the short run.

**Provide support to re-educate users on how to use rapidly changing technologies.** Most participants emphasized the critical need to have the necessary support personnel who can re-educate instructors about rapidly changing technologies. They emphasized that this is important because it impacts what is taught in the classroom and how instructors teach. Participants discussed the need for individualized training (“education for you”) that provides instructors with examples of how they can use technology in their classes.

**Inform students that rapid change will be part of their professional lives and provide them with the skills to adapt to change.** Some participants noted that once students embark on their careers they will have to have skills which allow them to learn to adapt to change. Some participants also noted that students need to learn how to use technology to access information, to communicate and collaborate, and to manage the large amounts of information that is available to them.

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*I would like to support campus wide generation of groups to discuss these things [ways to use information technology networks] and come up with projects.*

*...some facilities are under-used because people need basic education on how to use the technology.*

*It is important for students to understand how fast things are moving and where they are going, and give them the feeling that this rate of change is not going to stop after they graduate. They need to understand that they need to keep up with their education and this is quite a different way of looking at education than the relatively static topics that we’ve taught in the past.*

*You actually have to have people come into the loop. Maybe even with undergraduates the thing to do is to have a University course that is required on information technology. It has to be dynamic from year to year. The idea the first year is that they learn how to access this stuff, and then they continue to learn.*

*I think the idea of an information technology [seminar during student orientation] is excellent, because we trod students through the library both at an undergraduate and graduate level. This would be the natural extension, in fact I would like to see more of our support services based in the library; that is the place that people still go, and make that our access point for classes.*
Key Challenge: Focus on providing technologies that are shaping future learning environments.

Next Steps:

Provide guidelines for applications and platforms the University will support. Most people discussed the need for having some guidelines.

Provide incentives for meeting University guidelines while still encouraging innovation. A few people noted that we need to encourage innovation, but we need to be able to provide incentives to departments so that they develop their infrastructures within guidelines that the University can support.

When deciding on future investments in technology, look at the detailed examples of the type of hardware and software that participants want in their future learning environments. They talked about:

- easily visualizing data. (They discussed the need to have projection panels so that instructors can demonstrate software programs.)
- answering users' questions by using video and audio communication, as well as screen-to-screen capture/send
- easily and frequently sending E-mail that contains movies and audio/video documents
- routinely creating animated sequences to videotape and disk
- working with powerful and multi-platform workstations that need larger hard drives, more RAM, and faster processors. (Instructors want workstations that allow students to visualize X-rays and slides for class discussion.)

Technology covers a wide area and is hard to centralize... but there are areas to centralize. I oppose standardization, but support guidelines (e.g., for 10 applications for 10 machines, not 100)... so we have some groups that know equipment and can provide better support.

We need to tolerate diverse platforms, but if there is freedom for every department to do all things and use all different platforms, it will be difficult to support. If departments have money and do what they want, they need their own support. Maybe we need to encourage departments with incentives, possibly with matching money. We need to develop a system to keep departments within a structure and in focus with the University as a whole, while at the same time meeting the needs of individual departments and encouraging more innovation. We need more flexibility for departments to explore or start something or get software to help the instructional setting.

In a couple of years, we will require all of our students to acquire laptops, whatever is applicable at that time. The school or department will go from providing some computing, as in [current] open and public labs, to providing a networked infrastructure. We will not provide computers (maybe just a few to those students who drop them on the way to school); instead, we would provide things like high-end rendering, scanning, high-end plotting devices, color plotters, Laser Writers and that kind of stuff—things students wouldn't get out of their portable notebook [computer]. We would provide the infrastructure that they could plug into anytime they were in the building, and this infrastructure would extend the use of their notebooks [computers].
• accessing distant data, especially ultra high quality images, and having ways to easily and inexpensively generate and make available such information.

• working with seamless access, voice input, open computing, remote computing, much faster modem support
• creating personal databases that can be shared over the network so people can search and add data, e.g., from longitudinal studies
• accessing information from other colleges and universities, and the University of Minnesota from home
• moving instructional computer environments into distance learning. (For example, one person discussed the need for creating archive databases and the necessary tools that will allow faculty to tailor the database information for specific classes.)

Enhance the quality/effectiveness of available support services and training. One focus group talked about this at length. Some participants provided specific examples for new types of support services. For example, they recommended that we:

• provide the Microcomputer Group's in-services as on-line tutorials
• educate students about on-line information resources, and
• provide multimedia presentations to faculty and provide them with access to the resources to deliver multimedia presentations.

Two perspectives emerged on the topic of one single source for help. People talked about the "self sufficient model," where it is up to the individual to use available resources. Other people talked about an "empowerment model," where trainers understand the context in which users use the technology and customize the training to increase the capacity of the user.

People HATE to spend the first hour of tackling a problem figuring out who should handle it. The single source should culminate in a single phone number. When services transcend boundaries, the issue of who pays always comes up. This should be addressed.

...go to the department and focus on that faculty's needs...."education for you."

We need a mechanism for unit support. As computing is distributed, we need to have a mechanism for help and support distribution. One stop is OK for hard cores, but units need to develop their own support with help from the central group.

Provide a central training system to do a "train the trainer" approach. Departmental people would be trained and be a local resource, but central resources would be available, too.

Help faculty to become aware of how to use technology in the class. It is a very important tool in the immediate future... Need more education from central University—individual departmental funding is too thin.
Key Challenge: Support new instructional paradigms.

Next Steps:

At the end of one focus group, there was agreement among all participants that there is a new instructional paradigm shift that needs to be emphasized in the vision. This paradigm shift includes meeting the needs of our diverse students (e.g., commuters and part-time students), facilitating global connections, and focusing on the land grant mission. People agreed during the focus group that the next steps that had been discussed would help instructors implement this new instructional paradigm.

If this is the University of Minnesota vision, then there should be some way of showing how it’s meeting the needs we have identified this morning—the commuting student, the part-time student, the land grant mission, our international relationships, and this new instructional paradigm.

We need to think about reaching out to other folks in the community. We’re doing an excellent job of talking to ourselves. I would like to see primary schools and secondary schools have access to our E-mail network. This is good for recruiting students.
Appendix 1

Background on Information Technology Planning Project

Senior University management created an Advisory Users Committee (AUC) in 1992, asking this committee to create a vision of computing and information technology for the University and offer some preliminary strategies for achieving that vision. The AUC vision states:

We envision an electronic environment, a common space, that invites members of the University community to make use of distributed information technology in realizing our land-grant mission. In addition we wish to involve members of the community at large in this collaboration. This environment will be tolerant of diverse computing platforms, provide access to global information resources, and will value innovation. (August 12, 1992)

The vision and strategy document received endorsement from the President’s Cabinet, the Senate Committee on Computing and Information Systems, and the University Senate. The AUC shared the vision with academic units and key University information technology personnel by placing it on Gopher and sending copies of it via campus mail.

To implement the vision, senior management chartered an Information Technology (InfoTech) Steering Committee, which recommended an approach that focuses on establishing the linkage between the University’s strategic requirements and its ability to use information technology to address the needs of academic and administrative units. Specifically, the Steering Committee recommended a five-step process for implementing the vision and initiated the InfoTech Planning Project. The table below lists the five tasks and the current working status for each task.

<table>
<thead>
<tr>
<th>Task</th>
<th>Working Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review University strategic direction</td>
<td>The InfoTech Team is communicating with the University Planning Steering Committee to ensure that customer information technology needs align with the University mission.</td>
</tr>
<tr>
<td>Assess customer needs for information technology</td>
<td>The Customer Assessment Group formed as part of the InfoTech Planning Project is conducting the customer needs assessment now. Focus groups and reports are completed.</td>
</tr>
<tr>
<td>Assess existing information technology investments</td>
<td>The Provider Assessment Group formed as part of the InfoTech Planning Project is conducting the central and distributed provider assessment now. Focus groups are completed and reports are in progress.</td>
</tr>
<tr>
<td>Develop strategic information technology architecture</td>
<td>The InfoTech Steering Committee will select people to develop the information technology architecture after the customer and provider assessment is completed.</td>
</tr>
<tr>
<td>Develop tactical implementation plans</td>
<td>The InfoTech Steering Committee will select people to develop tactical implementation plans after the customer and provider assessment is completed.</td>
</tr>
</tbody>
</table>
Appendix 2

Customer Council

The InfoTech Planning Team decided to form and work with a customer council in order to obtain input from customers of information technology. The Customer Council consists of 150 individuals nominated by their college dean or chancellor (up to a total of 4 faculty, administrative staff, technical staff, and students) or central department head/director (up to 3 members). Customer Council members were invited to participate in the project through involvement in focus groups and through Council meetings.

A smaller (19 members) subset of the Council, the Customer Council Liaison Group, was more heavily involved with the project by providing suggestions for writing final reports and providing feedback on drafts.

Customer Council members came from the following colleges/campuses and units:

<table>
<thead>
<tr>
<th>Colleges/Campuses</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carlson School of Management</td>
<td>Academic Affairs/Minority Affairs</td>
</tr>
<tr>
<td>College of Agriculture</td>
<td>Administrative Information Services</td>
</tr>
<tr>
<td>College of Architecture &amp; Landscape Architecture</td>
<td>Admissions</td>
</tr>
<tr>
<td>College of Biological Sciences</td>
<td>Alumni Relations</td>
</tr>
<tr>
<td>College of Education</td>
<td>Audits</td>
</tr>
<tr>
<td>College of Human Ecology</td>
<td>Boynton Health Services/U Counseling Services</td>
</tr>
<tr>
<td>College of Liberal Arts</td>
<td>Business Services</td>
</tr>
<tr>
<td>College of Natural Resources</td>
<td>Campus Health &amp; Safety</td>
</tr>
<tr>
<td>College of Pharmacy</td>
<td>Campus Master Planning</td>
</tr>
<tr>
<td>College of Veterinary Medicine</td>
<td>Computing &amp; Information Technologies</td>
</tr>
<tr>
<td>Continuing Education &amp; Extension</td>
<td>Development Office</td>
</tr>
<tr>
<td>General College</td>
<td>Disabilities Serv./Disabled Student Cultural Ctr.</td>
</tr>
<tr>
<td>Graduate School</td>
<td>Equal Opportunity &amp; Affirmative Action</td>
</tr>
<tr>
<td>Humphrey Institute of Public Affairs</td>
<td>Facilities Management</td>
</tr>
<tr>
<td>Institute of Technology</td>
<td>General Counsel</td>
</tr>
<tr>
<td>Law School</td>
<td>Housing &amp; Food Services</td>
</tr>
<tr>
<td>Medical School</td>
<td>Human Resources</td>
</tr>
<tr>
<td>Minnesota Extension Service</td>
<td>Management Planning &amp; Information Services</td>
</tr>
<tr>
<td>School of Dentistry</td>
<td>Media Resources</td>
</tr>
<tr>
<td>School of Nursing</td>
<td>Minnesota Supercomputer Institute</td>
</tr>
<tr>
<td>School of Public Health</td>
<td>Office of International Education</td>
</tr>
<tr>
<td>University College</td>
<td>Printing Services</td>
</tr>
<tr>
<td>University of Minnesota, Crookston</td>
<td>Recreational Sports/Student Union</td>
</tr>
<tr>
<td>University of Minnesota, Duluth</td>
<td>Registrar</td>
</tr>
<tr>
<td>University of Minnesota, Morris</td>
<td>Research &amp; Technology Transfer Administration</td>
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<td></td>
<td>Student Financial Aid</td>
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<tr>
<td></td>
<td>Telecommunications</td>
</tr>
<tr>
<td></td>
<td>University Art Museum</td>
</tr>
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<td></td>
<td>University Hospital and Clinic</td>
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<td></td>
<td>University Libraries</td>
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<td>University Press</td>
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<td></td>
<td>University Relations</td>
</tr>
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<td></td>
<td>University Services</td>
</tr>
</tbody>
</table>
Appendix 3

Description of Focus Group Process and Participation

Focus Group Methodology

An outside consultant, Marsha R. Mueller & Associates, was hired to moderate the focus groups. Mueller has a master's degree from the Department of Social Science, University of Chicago. Her skills include work in program quality assurance, policy analysis, program evaluation, applied research, adult education, strategic planning, and group facilitation. Her professional background includes program management experience at The Pennsylvania State University and University of Illinois, along with research and evaluation work at the University of Minnesota.

A pilot focus group was conducted; some of the original focus group questions were changed based on this pilot. Focus group participants completed a pre-focus group survey which requested that they read the 1992 Advisory Users Committee (AUC) Vision and begin focusing thoughts on their information technology needs.

During each focus group, assistant moderators (Info Tech Planning Team members) took notes and tape recorded the session. After each focus group, assistant moderators collected the completed pre-focus group surveys, re-listened to the tapes, reviewed their notes, and created organized notes. The organized notes maintain confidentiality in informants' responses and include information from the pre-focus group surveys. The consultant provided feedback on all organized notes.

One team member then took the organized notes from a functional area (i.e., instruction, administration, student, research, or outreach) and drafted the report for that area, incorporating feedback from the consultant, InfoTech Planning Team members, and Customer Council Liaison Group members.

Focus Group Attendance

Some people attended more than one focus group. A total of 98 individuals participated in the focus group process. Focus groups were initially scheduled for the month of August, but scheduling was expanded through October 4 to accommodate faculty and students who were gone during the summer.

<table>
<thead>
<tr>
<th>Number of Focus Groups</th>
<th>Attendance</th>
<th>Surveys Collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>6</td>
<td>49</td>
</tr>
<tr>
<td>Instruction</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>Outreach</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>Research</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Student</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
<td><strong>119</strong></td>
</tr>
</tbody>
</table>
Appendix 4

Pre-Focus Group Survey and Focus Group Questions

Below is a condensed version of the pre-focus group survey and a list of the focus group questions. Marsha R. Mueller & Associates worked with the InfoTech Planning Team to develop the survey and questions.

Pre-Focus Group Survey

Part I. This part involves reacquainting yourself with the August 12, 1992 Vision and Strategy for Computing and Information Technology. Please read the document carefully.

Part II. This part focuses on your current and anticipated information technology requirements.

Current Requirements. Think about your work and how information technology supports what you do. List the information technologies you count on now to support your work at the University. (Please be as specific as possible.)

Future Requirements. Think about how you anticipate your work will evolve over the next 5 years and what you expect to accomplish. In what ways will your information technology requirements change over the next 5 years?

Future Requirements (students). In what ways do you feel student requirements for information technologies will change over the next 5 years?

Part III. This part seeks your assessment of specific parts of the Vision and Strategy statement.

For the vision statement

- To what extent do you feel the vision statement is on target? (In other words, does the statement adequately reflect where information technology needs to be 5 years from now to support high quality, globally competitive work at the University?)
- What changes in the statement, if any, would you recommend? (Please describe.)

For each of the six objectives in the vision statement, participants answered the following questions

- How important is this objective in reaching the vision of information technology at the University?
- What changes, if any, are needed in this objective? (For example, is anything missing and/or should some parts be deleted?)
- Are there other objectives which you feel should be added to this list? (If so, please describe.)
Pre-Focus Group Survey and Focus Group Questions
Page Two

For the Graphic Representation of The Commons
Please assess this visual by responding to the following questions:

(1) Is it clear to you what this visual is illustrating?

___NO       ___YES⇒If yes, what does the visual represent to you? (please describe)

(2) Does this illustration adequately reflect the vision statement and objectives?

(3) In what ways should this illustration be modified or changed to communicate the vision statement and objectives? (Please describe or draw your recommended changes.)

Part IV. This part asks you to identify current information technology projects that you consider to be particularly innovative and/or interesting.

Please list any information technology projects (within or outside of the University) that you think are particularly innovative or interesting. The projects you list should be ones that you feel should be looked at for possible use at the University. In addition, briefly note the attributes of the project that make it innovative or interesting.

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>EXCITING ATTRIBUTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Name/sponsor, brief description)</td>
<td></td>
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</tbody>
</table>

Focus Group Interview Questions

Questions focusing on current work environment/information technology use

What does Information Technology mean to you?

I would like you to think about the environment, or context, in which you do your work. If you're like most of us, there are factors in our work environment, factors more or less outside of our control, which can either enhance or limit our effectiveness. What are some of the key factors, or attributes, of your work environment that you feel significantly enhance the overall effectiveness of your work?

We've been discussing your current work environment. I would like to know more about how information technology fits in to the work that you do. Tell me about the information technologies you consider to be essential to your work and how you use them.

Today information technology is supported and managed in different ways at the University.

• Based on your own experience, what works? What aspects of the current way information technologies are handled do you think are effective and should be maintained?

• What about factors which limit your effectiveness? What are some of the key factors of your work environment which limit the effectiveness of your work? What aspects of the current way information technologies are handled do you think are not working and should be changed?
Questions focusing on future requirements

All of you spent a substantial amount of time completing the pre-interview survey. One of the questions asked you to think about how you expect your work to evolve over the next 5 years and what you want to accomplish. One question in particular, asked how your information technology requirements will change.

- What do you see as key challenges in the next 2-4 years?
- In what ways will your information technology requirements change over the next 5 years?

Getting where you want to be 5 years from now means that progress must be made along the way. From your perspective, what must the University do in the short term, let's say within the next 2-4 years, to enhance the likelihood that you'll meet your information technology requirements 5 years from now?

Questions focusing on vision/objective statements

I want to change topics somewhat for our final questions. Up to this point we've been discussing your current and future requirements. Before coming today you had an opportunity to re-read the vision and objectives statement.

What is your reaction to the vision statement? Based on how you see your requirements now and in the near future, does the statement make sense?

What was your reaction to the objectives? Are those the smart things to be doing if the University is to fulfill its vision? Should the objectives be changed in anyway? Is anything missing?

What is your reaction to the visual (i.e., of the Commons)? If you were the designer and decision maker, what would you include in the Commons and what would you exclude?

Can you tell me about any exciting projects that you are involved with or familiar with?

Do you have any final comments you would like to make about the future of information technologies at the University?
Appendix 5

Members of Information Technology Planning Project

**Information Technology Planning Project Steering Committee**

Tim Fitzpatrick, Administrative Information Services
Linda Jom, College of Agriculture/Instructional Computing
Charlene Mason, University Libraries/Automated Systems
Mike O’Connor, Finance and Operations/Operations Development
Don Riley, Academic Affairs/Computing and Information Technologies
George Wilcox, Medical School and Supercomputer Institute

**Information Technology Planning Project Team**

Roberta Armstrong, Student Affairs Information Systems
Jim Colten, Computer and Information Services
Jodie Berg Combs, Administrative Information Services
Larry Dunn, University Networking Services
Judith Howe, Administrative Information Services and The Graduate School
Linda Jom, College of Agriculture/Instructional Computing
Charlene Mason, University Libraries/Automated Systems
InfoTech Planning Project
Customer Needs Assessment

Outreach Summary

Prepared for:

InfoTech Planning Steering Committee
InfoTech Planning Customer Council Members
InfoTech Planning Provider Council Members

Prepared by:

Customer Assessment Group
InfoTech Planning Team
University of Minnesota

January, 1994
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<td></td>
<td>Purpose of this Document</td>
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<td>Other Focus Group Summary Reports</td>
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<td>InfoTech Planning Project</td>
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<td>Purpose of Customer Needs Assessment</td>
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<td></td>
<td>Customer Assessment Process</td>
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<td>Focus Group Purpose</td>
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<td>About the Outreach Focus Groups</td>
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<td>Executive Summary</td>
<td>How Participants Talk About &amp; Use Information Technology</td>
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<td>Key Challenges and Next Steps</td>
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<td>Findings</td>
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<td>Key Challenges and Next Steps</td>
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<td>Appendices</td>
<td>Appendix 1: Background on Information Technology Planning Project</td>
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<td></td>
<td>Appendix 3: Description of Focus Group Process and Participation</td>
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<td></td>
<td>Appendix 4: Pre-Focus Group Survey and Focus Group Questions</td>
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<tr>
<td></td>
<td>Appendix 5: Members of Information Technology Planning Project</td>
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</tbody>
</table>
Audience for and Purpose of this Document

Audience
This summary was prepared for the InfoTech Planning Steering Committee, Customer Council Members, Provider Council Members, and people who will be involved in the next step of the InfoTech Planning Project.

Purpose of this Document
This document provides a detailed summary of information that key informants about information technology at the University of Minnesota provided during outreach focus groups. The focus groups were conducted as part of the Information Technology Planning Project.

For readers who are not interested in the amount of detail provided in this document, a summary of major findings across all five functional focus groups (administration, instruction, outreach, research, and student) will be available early in 1994.

The following are provided in this document:

- a background section, which describes the Information Technology Planning Project,
- an executive summary, which highlights key findings, and
- a findings section, which details participants' focus group comments.

Read the findings section if you want to:

- understand and read about specific examples of how outreach personnel are using information technology,
- learn what outreach personnel think is working and is not working in terms of information technology,
- understand what outreach personnel view as key information technology challenges and next steps the University should take in order to meet their information technology needs,
- make informed budgetary and organizational decisions during your unit planning cycle in order to meet information technology challenges facing outreach personnel, and/or
- improve current information technology services.

Other Focus Group Summary Reports
If you wish to acquire or read summary reports from the administrative, instructional, research, or student focus groups, or if you need the reports in alternative format, please contact:

Office of the Associate Vice President for Academic Affairs/
Academic Computing & Information Technologies
University of Minnesota
8 Morrill Hall—100 Church Street SE
Minneapolis, MN 55455
Telephone: (612) 626-9816.

Text of the reports also appears on the Internet Gopher. The path is:
\Home Gopher Server
\University of Minnesota Campus Information
\University Planning
\Information Technology Planning
\Customer Assessment Reports.
### Background

**InfoTech Planning Project**

Senior University management created the Advisory Users Committee (AUC) in 1992 and asked this committee to create a vision of computing and information technology for the University of Minnesota. In August, 1992, the AUC created a vision statement; senior management then chartered an Information Technology (InfoTech) Steering Committee which recommended a five-step planning process to implement the vision:

- review University strategic direction
- assess customer needs for information technology
- assess existing information technology investments
- develop strategic information technology architecture, and
- develop tactical implementation plans.

The InfoTech Steering Committee established the InfoTech Planning Team which has reviewed University strategic direction, assessed customer needs for information technology, and assessed existing information technology investments. Several documents have been created that report on customer needs for information technology and provide details on existing information technology investments. These reports will be distributed Winter Quarter 1994 and will help to guide decisions made in the next step of the Information Technology Planning Project. (See Appendix 1 for more background information on the Information Technology Planning Project.)

**Purpose of Customer Needs Assessment**

The customer needs assessment has two purposes: (1) validate the AUC vision with University units, and (2) assess University of Minnesota customers' needs for information technology.

This information will help guide decisions made in the next step of the Information Technology Planning Project, and will also be shared with providers of information technology at the University for their planning use.

**Customer Assessment Process**

**Key Informants.** Key informants of information technology were nominated by their collegiate, campus, or unit administrator (see Appendix 2 for list of units) to form the Customer Council. Customer Council members attended meetings and participated in focus groups, and will fill out a survey (described below). A smaller (19 members) subset of the Council, the Customer Council Liaison Group, was more heavily involved with the project by offering suggestions for writing final reports and providing feedback on drafts.

**Customer Council Meetings and Liaison Group Meetings.** Customer Council members attended three meetings where they were informed about the planning process and listened to invited speakers discuss future information technology trends. Liaison Group Members attended several meetings where they provided feedback on draft reports and discussed the information technology planning process.

**Focus Groups.** Focus groups were conducted in order to validate the vision and assess customer needs (see below for further detail; a comprehensive description of the process and participation is also provided in Appendix 3).

**Survey.** Early Winter Quarter 1994, a survey of the Customer and Provider Councils will be conducted that will produce ratings to be used in developing a ranking of steps the University should take in the next 18-24 months to meet customers' needs for information technology.
Focus Group Purpose

- understand users’ current work environment and information technology use as well as their future information technology requirements
- understand information technology users’ reaction to the AUC vision, and
- obtain a list of exciting information technology projects.

Focus Group Process

There were 21 focus groups conducted from August through October, 1993. An outside consultant was hired with skills in strategic planning and focus group facilitation to moderate the focus groups (see Appendix 3 for further consultant credentials). Key informants self-selected into the following functional roles and attended corresponding focus groups: administration, instruction, outreach, research, and student.

Focus group participants completed a pre-focus group survey and answered a set of common questions during the focus groups. (See Appendix 4 for pre-focus group survey and focus group questions.) The InfoTech Planning Team members conducted a rigorous, reiterative process for synthesizing data from the focus groups. (As noted above, Appendix 3 provides more detail on this process.)

About the Outreach Focus Groups

There were 4 outreach focus groups conducted during August and September, 1993, with a total of 17 participants. Because several of the participants also took part in other focus groups, only 4 surveys relative to outreach issues were collected.

Participants expressed appreciation for the opportunity to contribute to this assessment, became very involved in answering questions, and joined into in-depth discussions of information technology issues. Attendees represented a broad spectrum of individuals: faculty (5), department director and other middle management (4), marketing and public relations (3), computer support (3), student (1), and librarian (1).

Future Reports

One other customer assessment report has been written and is being sent to Customer and Provider Council members, administrators who nominated Customer Council members, the Senate Committee on Computing and Information Systems, and the President’s Cabinet. This report summarizes major findings across all five functional focus groups. Additional copies of this report will be available early in 1994.

A concurrent assessment of existing University information technology investments is being conducted and a report on these findings will be available early in 1994. Lastly, a report which combines customer and provider assessment summaries will also be available early in 1994.
Executive Summary

This section highlights the key findings for the outreach focus groups, and is structured so as to provide an outline of the Findings section.

How Participants Talk About & Use Information Technology

Participants defined information technology differently depending on experience and needs. Most spoke about information technology in terms of how it helps them do their jobs; they consider it to be an important tool in their current work environment and a critical component for meeting ever-growing future demands.

- Information technology is a broad concept and people hold widely differing definitions of what it is;
- University personnel work to build and maintain an extended sense of the University community;
- University personnel need to disseminate information rapidly so that people have current information to make critical decisions;
- University personnel reach out and teach people who live away from the University campuses; and
- University personnel work to address critical state and community needs.

What’s Working Now? What’s Not Working?

Participants were asked to identify information technology that is working now (and thus should not be changed) and what should be improved. Participants’ comments covered a wide range of ideas and experiences and stated high expectations. It was clear in all focus groups that people often could not talk about what is working without talking about what is not working, and some things were noted as both working well and working poorly (i.e., some aspects of the technologies were judged to be weak while other aspects of the same technology were judged to be strong).

Comments from all focus groups—administrative, instructional, outreach, research, and student—tended to fall into five general categories: 1) Base Services (Network/Access, Hardware, Applications & Information); 2) Support Services (Reliability, Problem-resolution Services, Training); 3) Policy/Guidelines; 4) Organizational Structure (central and other); and 5) Human Resources.

Base Services:

Access to information and technology was widely discussed; there was a particular focus on the network’s role in providing access. The existing state of network deployment was said to be inadequate and there are both technical and policy barriers slowing the rate of deployment.

Participants feel that support for departmental and individual hardware access and acquisition is important, and that too many people lack the necessary hardware.

Participants also spoke about shortcomings in existing applications and information services.
Support Services:

Participants expressed a strong need for problem resolution and Help Line services. They spoke about both the quality and quantity of these services, citing successes and significant failures on both counts.

Participants discussed the importance of reliability in services which are used in support of mission-critical functions. They expressed some dissatisfaction with the reliability of certain services.

Additionally, participants discussed the importance of training to information technology users and their perceptions of our failures in this area.

Organizational Structure

Participants said that, organizationally, we not only fail to encourage collaboration and sharing of information technology, it is sometimes discouraged.

Key Challenges and Next Steps

Several key challenges surfaced when participants were asked to discuss future key challenges the University needs to address in the next 2-4 years in order to meet users' information technology needs. Participants also noted next steps that could be taken in order to meet these challenges. Challenges and next steps include the following:

• The University must find ways to be more efficient and effective in core institutional activities (instruction, research, outreach, administration).

• Appropriate policies, organization, and infrastructure—within the University and the broader community—should be developed to support the effective use of new technologies.

• Support for users of technology (e.g., information sharing, training, support services) should be strengthened.

• Even in times of declining resources, it is imperative that financial resources be obtained to apply to information technology needs.

• Some outreach activities have potential for generating their own funding.

• The University should accelerate the development of the information technology infrastructure.

• A major effort should be made to improve the quality and integrity of information.

• The presentation of information should be organized in more useful ways.

• A consistent user interface is needed.

• Information technology services should be very easy to use.

• It is important that the University provide incentives for innovation.

• People should be encouraged to share expertise, and be rewarded for doing so.
Findings

The Findings section in this document is divided into three categories:

**How Participants Talk About & Use Information Technology**
This section describes how participants define information technology and how they use it in their work. Focus group participants provided many examples demonstrating that information technology is supporting the University's mission.

**What’s Working Now? What’s Not Working?**
This section contains participants' views on which aspects of information technology at the University work well and which do not work well. Participants frequently identified aspects of information technology as both working and not working. For example, some participants stated the network works quite well, while others stated the network is not truly effective because it is inaccessible from too many places.

**Key Challenges and Next Steps**
This section describes what participants discussed as key challenges for meeting their information technology requirements. Also listed are next steps that participants stated the University should implement in order to enhance the likelihood that their information technology requirements would be met.

Note: In this section of the document, the words “few,” “some,” and “most” have been used in order to help the reader understand how many people discussed an idea or made a comment during the focus group sessions. The word “few” means that the idea was discussed or comments were made in one focus group, “some” means in two focus groups, and “most” means in three or more focus groups. Material in *italics* is quoted information from the focus group sessions.

**How Participants Talk About & Use Information Technology**

Information technology is a broad concept and people hold widely differing definitions of what it is.

Participants viewed information technology as a means by which information (printed or electronic) is stored, assimilated, cataloged, collected, related, and distributed inside or outside the University, on a need to know or as desired basis.

Some people are intimidated by the term information technology. One respondent said that outside of computer science, students avoid using computers and feel that they do not need computers. While this may be an unjustified generalization, it is true that there are people who feel drawn to use information technology and there are people who, if left on their own, would avoid using information technology, or at least be slow to adopt its use.
Some of the participants' definitions focused on information itself; others focused on software and hardware. A few of the participants rejected this dichotomy, preferring to view information technology as a single entity—information made more accessible and useful via technology.

**University personnel work to build and maintain an extended sense of the University community.**

An extended sense of the University community is achieved when broad segments of the statewide community feel that they or someone they know receive a personal benefit because of what the University does.

Some participants offered the DIAL-U program as a good example of the University serving individual needs, as an example of cost recovery, and as an example of the importance of promotion in such a service.

**University personnel need to disseminate information rapidly so that people have current information to make critical decisions.**

Some participants said that the University can use information technology to serve the outreach customer with more current information in a manner which is both more timely and more convenient to the customer.

University Relations is using information technology because it reduces costs and allows them to reach their outlets more quickly and easily. They use MediaLink (a service similar to a wire service) to provide info via terminal to small town newspapers in Iowa. This replaces a manual mailing to about 500 locations. We can also send material to MediaLink using a fax. MediaLink can also help the University better target the audience for individual press releases (e.g., outstate dailies, weeklies, etc.)

A few participants considered information technology to be a means to fulfill known unmet needs.

I would like to see information technology give the University more presence throughout the state. It will give people the opportunity to access University resources.

If we could provide our documents via electronic systems, the information would be more timely and help farmers tremendously. Farmers don't have time to go to the county office and see what is new, so if they had access from the farm, most progressive farmers tell me it would be a tremendous support to have electronic access to the information.

The fax has probably revolutionized public relations. It is the greatest invention in the last 20 years....everyone uses fax as an interactive communication system.

Knowing that a feature editor has an E-mail address, I can send information and get reactions.
The State of Minnesota once offered a Minnesota Drug Information Service, a valuable service which was discontinued. The University possesses the knowledge required to replace such a service and could make good use of information technology in doing so.

**University personnel reach out and teach people who live away from the University campuses.**

A few participants discussed how more Minnesotans need instruction than ever before, and they need it more often than ever before. Distance makes the University a poor choice for at least half of all Minnesotans. The University could use information technology to make itself at least as convenient and accessible as local alternatives.

Information technology is important for outreach in particular. It extends the ability of people to access campus classes. In years past, people physically had to come to location to get instruction or information. Technology is important to outreach (although not always seen that way) as it permits people to stay in their own location and access resources of the University. We have 110 field offices and, without information technology, we would be severely handicapped in our ability to... provide the latest information. For example, through the Internet, we provide the latest policy reports from Washington, DC—the latest farm market reports, and the latest research on children, youth, and families.

**University personnel work to address critical state and community needs.**

One participant described how University personnel facilitate distribution of the health workforce throughout the state. Technology allows students to look for work opportunities and employers to look at market and economic conditions.

**What’s Working Now? What’s Not Working?**

**Base Services: Access**

Access to information and technology was widely discussed; there was a particular focus on the network’s role in providing this access. The existing state of network deployment was said to be inadequate and there are both technical and policy barriers slowing the rate of deployment.

Most participants consider access to the network to be very important, and those who already have access are quite pleased with the service. Most participants also believe that too many people and places are without network access and this greatly diminishes information technology’s potential as a means for addressing the University’s needs.

...base level of access...should be ensured.
Some said that information technology cannot offer effective solutions unless there is a very large critical mass of people connected to the network.

Most participants said that uneven and inadequate network access is an issue both on campus and off campus. It was noted that there is a disparity between the “information rich” and “information poor” in Minnesota and that it would be good public policy to address this by reducing or eliminating the disparity. The University, as a major source of information in Minnesota, should have a valid and important role in this endeavor.

Some said that the practice of billing departments for connection costs to the backbone is inequitable because it results in different costs to different departments for similar service, and it keeps the poorer departments from connecting to the network.

Some participants said that there is still too much local knowledge required in order to connect to and effectively use the network. It needs to be as easy to use as the phone—as reliable and as ubiquitous.

Gopher is almost always mentioned as a technology that has brought recognition to the University and that is being widely used to disseminate information.

While Gopher, as a technology, is viewed as very good ...it lacks a basic information management function. This, combined with lack of overall information ‘oversight’ at the University, severely limits its value as a service.

Base Services: Hardware

Participants feel that support for departmental and individual hardware access and acquisition is important, and that too many people lack the necessary hardware.

Some people lack adequate access to basic hardware needed for the use of information technology in their jobs; some do not.

Go back to the 1930s and look at rural electrification. It’s strictly a matter of economics that it is a lot cheaper to serve a high density area than to serve a low density area. That’s the original reason for rural electrification policy. Now we have the buzz words RURAL DATA-FICATION. We need subsidizing for an infrastructure to develop. It won’t be profitable for an MCI, U S WEST, AT & T or a Sprint to sink a lot of money in a low density area.

I have a lot of experience trying to hook up faculty on the St. Paul Campus directly to the Internet. Departments bear the cost to do this. It happens if the department has the money. If departments can’t afford this, it just doesn’t happen.

I think—particularly on the outreach side—one of the University’s big successes has been Gopher and the ability to sort through the Internet...in a sense let the outside world know what we have to offer and how to manipulate throughout it as well as giving other institutions the ability to do the same thing...It’s an incredible major success for the University as a whole and for its outreach efforts.

Base level of access...should be ensured.

Some State University System campuses and Vo-Techs provide better equipment for student use than the University.
Most participants said that organized equipment purchase programs have helped make it easier to acquire equipment. Although it does not directly relate to outreach, I think one of the successes which gets under-rated...is the...buying program at the Bookstore; the ability for us to get equipment fairly cheaply and fairly easily gives us an advantage—to be able to buy a fair amount of equipment fairly easily for as little money as possible. It's really been the core for us to be able to expand our computers.

**Base Services: Applications & Information**

Participants spoke about shortcomings in existing applications and information services. Centrally supported E-mail services are very popular among those that use them. Free access to E-mail is almost unparalleled in institutions across the country; congratulations on this! It is ambitious. We don't have resources to back up as much as we want, but congratulations for doing it.

Many systems are doing what they were designed to do, except that they are hard to change—and this is a problem in a fast changing world.

Outreach activities rely on the use of mailing lists. Our services and capabilities in this area are weak. Even basic things like 9-digit zip codes and avoiding duplication are inadequate. More sophisticated use is important and lacking.

Some said that the University has a big problem with “inaccuracy” and “lack of current information.”

**Support Services: Problem-resolution Services**

Participants expressed a strong need for problem resolution and Help Line services. They spoke about both the quality and quantity of these services, citing successes and important failures on both counts.

Most participants said that they receive a lot of good assistance from the Help Lines. They also reported a number of problems:

- they frequently have to wait much too long to get through to the Help Line consultants.
- different organizations provide similar services, leading to duplication and sometimes different answers to the same question if posed to more than one service.
- it is difficult to know where to go or call when you have a problem.
- UNIX support is minimal and does not cover enough of the varieties of UNIX.
- E-mail help has been plagued by long waits and much buck-passing.
Participants valued support services that operated with a sense of continuity. They said that support services are most valuable when provided by people who were familiar with their needs and work styles. Turnover in support staff is disruptive and it diminishes productivity.

Support Services: Reliability

Participants discussed the importance of reliability in services which are used in support of mission-critical functions. They expressed some dissatisfaction with the reliability of certain services.

Some participants said that basic services are not always reliable enough to be considered usable as general services in support of mission-critical activities. E-mail was singled out as an example.

Some said that networks are often susceptible to problems caused by changes made by people who do not fully understand the ramifications of what they are about to do.

Some felt that there is insufficient depth in supporting new services that are expected to help deliver mission-critical activities.

Support Services: Training

Participants discussed the importance of training to information technology users and their perceptions of our failures in this area.

Most said that there has been inadequate investment in training users to more fully exploit information technology.

Some said there are gains to be made if we merely did an adequate job of training people to use the information technology they already have.

This is more than just learning the details of using particular tools. It is also a matter of knowing what tools are available and being able to select the right tool for the job at hand.

If you work with people long enough I think you can learn about their style and they can learn about you and your office, so it is good to have some continuity. What I have liked in the past is some sort of consistency...continuity in how services are organized.

We've had a number of E-mail problems lately and that's been frustrating at a time when I'm trying to encourage people to use E-mail. Other people expect service to be like American telephones where you pick the receiver up and get a dial tone—always.

We can teach people how to push buttons, but need to teach people what you need word processing for, when to use desktop publishing, what a spreadsheet is for (vs. a database). Maybe we need to teach these concepts in required courses for staff/faculty/students.
Organizational Structure

Participants said that, organizationally, we not only fail to encourage collaboration and sharing of information technology, sometimes it is even discouraged.

Some of the participants said that the University lacks an organizational structure that coordinates the collection, maintenance and distribution of information and technology. It is difficult, sometimes impossible, to know what is available. It is often difficult to gain access to needed information that you know about.

Some noted that we lack a structured forum that would allow faculty to share projects and their expertise.

Some described how it is difficult to share specialized resources; this leads either to duplicated/under-used facilities or lack of access to facilities.

There is no forum to share what individual faculty are doing. When I sat in on the teaching/instructional group, I learned more about what was going on around campus, about how people see computer-based instruction. There’s no way to build on what people have learned or to share scanners; no infrastructure to communicate that information or to tell us who does what or who to call with questions. People duplicate the early part of the learning curve, and that takes so much time and energy.

We just wanted to make some color prints and we know the Army Center next door has a color printer ....we tried to make an arrangement where we would pay for supplies but our management said it would have to be charged back and they did not want to be involved in that.

Key Challenges and Next Steps

The University must find ways to be more efficient and effective in core institutional activities (instruction, research, outreach, administration).

Some participants felt that information technology offered good possibilities for being more effective in how we deliver instruction.

We should provide for self-registration (by telephone).

Most said that we should provide universal access to information technology for all staff and faculty.

I want distance education to be much more valuable. We can’t run around and drive cars around the state and visit farmers and small groups. We are losing positions and we have to be more efficient in providing information.

Give us an electronic village by making sure that every University constituent has access to everything we are seeking to provide. In that way, we are like a laboratory. Help us be more responsible and have better means to reach our constituents.
Some felt that we should seek ways to use information technology to free staff from routine activities so that they will have time for more complex duties (e.g., by using voice recognition to answer common questions).

A few said that we should promote the use of group software to share files and work together.

A few also believe that ways should found to be more effective in the use of information technology (e.g., compression of digital signals to allow for multiple courses to be offered at the same time).

### Appropriate policies, organization, and infrastructure—within the University and the broader community—should be developed to support the effective use of new technologies.

Most participants spoke about the need for a concerted effort to adopt and support standards in the use of information technology at the University and throughout the state.

Some participants noted that there are many institutions around the state which are attempting to link up to each other, but that the efforts are not coordinated. These fragmented efforts (e.g., Minnesota Public Radio, libraries, outreach at the University) create a result where the whole is less than the sum of the parts.

Participants suggested that the University should develop partnerships with existing state and local agencies which already have a presence throughout the state (e.g., schools, libraries, county offices or government service centers). These agencies already attract a clientele. People already look there for services. They are points of service for new offerings.

Since I'm not in charge there, I need the University to encourage that. I don't think the University can just depend on every department to develop standards—there's such a wide range of types of departments—I don't think they can depend on the individual department to come up with the best use and have the most forward thinking plus have it match what the University plans in a broader sense.

I think the University can take leadership with outreach. I hope the President's commitment to outreach is manifested in a technology focus.
Support for users of technology (e.g., information sharing, training, support services) should be strengthened.

Provide a center with equipment, hardware, and software to develop educational software.

Provide experts to assist faculty with development of course materials.

Provide more Help Line service.

Allow and reward sharing of expertise (both individuals and departments).

Sponsor cross-disciplinary seminars and promote the use of electronic forums (e.g. LISTSERVs, electronic bulletin boards, and USENet) to facilitate sharing.

Training should become part of faculty/staff orientation and freshman core curriculum.

Provide ongoing faculty education and develop incentives for faculty to use this.

Work to make the use of technology transparent to the user.

Programming staff need to be trained in the use of new tools and new approaches to deliver information technology.

Even in times of declining resources, it is imperative that financial resources be obtained to apply to information technology needs.

Some participants said that the University needs major funding to move from old technology to new (e.g., human resources systems).

The real issue is that you have faculty who have talent, imagination, and creativity but many of these people are not literate or skilled in programming or accessing the Internet or developing good computer-assisted instructional materials. With increased interest, they tend to want to learn more and more because there's no support system for people with technical skills to translate the knowledge to the application; faculty will thus dilute their educational efforts or technical efforts. I see a lot of economies. My ability is not best spent developing educational software. There are programmers who can do a far better job than I can, but I don't have access to programmers. So if I want to develop something, I have to learn how to do it, and this takes time away from teaching and research activities. Granted, it's all part of the effort, but it's not getting the best use of people. The challenge to the University is to pursue these goals and provide an infrastructure of technical people who can provide the necessary support services.

Training is important; I hope to see an increase in resources for training and support. It is easy to cut those areas. You make these tremendous investments and people only utilize the tool 20%.

To do compressed video has to be as easy as driving to the site.

...it seems to me the challenge of cost is always going to be with us at the University, and it's going to keep getting worse and worse; and although using the technology has already saved us a lot of money, we'll always be looking for ways for it to save us even more.
Some said to expect to find increasing demand for outreach activities as a possible source of funding (e.g. non-credit courses) and, further, to look for these opportunities.

Most said that units must include information technology in the budgeting process. Central and departmental administrators must be made aware that with information technology, initial investments often precede the benefits.

Information technology provides new possibilities for reaching out and serving Minnesotans and influencing their perceptions of the University. This extended sense of the University community is a crucial component of Minnesotans’ support for state funding of the University.

Seek out partnerships with other state and local agencies which are already involved in activities that draw people.

We need to take advantage of information technology's capabilities, which are more and more at a reasonable cost, to reach people we couldn’t reach....change the way people look at the University, too. We know from polling that the University is not seen as hospitable and friendly or an institution that is easy to work with. With information technology, we give more access points and we can go a long way to change attitudes, and that is why outreach is so important.

We really need to look at combinations to fulfill goals of the Twin Cities campus and to place us in a key position in the state for a 5-year plan. Use county libraries, high schools, museums. It looks much more attractive to go to the legislature and ask for additional funding when they can turn to their constituents outstate and say “this is what I'm providing you by funding the University.”

### Some outreach activities have potential for generating their own funding.

A few participants said that we should expect to see rapid growth in demand for outreach, and we should take advantage of the situation. Horticulture Department's DIAL-U program is a well established model for this.

There are two views of how to “fund” outreach:

1) generate $$, and

2) reduce cost.

One respondent offered an example of Intel installing an information distribution system based on fax, other technology, and a 1-800 phone number. It cost real money to implement, but in the end it reduced phone calls to support staff so much that it led to a net savings, even though with the old system the caller paid for the phone call.
The University should accelerate the development of the information technology infrastructure.

Most participants said that it is important to ensure that a certain basic level of service is available to everyone at the University.

If we really talk about universal access, it's not just access for the rich departments, but for the poor departments, as well. Other campuses handle this centrally and not out of departmental budgets.

A major effort should be made to improve the quality and integrity of information.

A few participants discussed the importance of information quality and integrity:

- the source of information should be easily identifiable;
- information has a life cycle and must be maintained throughout that cycle; and
- data is not always information; information is data organized so as to be useful.

The presentation of information should be organized in more useful ways.

A few of the participants said that, in many areas, information at the University lacks organization. It is almost random, almost an anarchy.

They also said that there should be institutional standards for the organization and presentation of information. Information should be organized in a manner that leads people to the information they are looking for.

A consistent user interface is needed.

Most participants mentioned that inconsistent interfaces are an obstacle to effective use of information technology; the University should adopt policies which encourage the use of interface standards.

Within the University, services like Gopher easily transport people from an environment that uses one interface to an environment that uses another kind of interface. This can be extremely confusing for the casual user who does not realize when "interface rules" have been changed on them.

If we want things to be widely used...it has to be simple to use, it has to be straightforward, it has to be uniform.
Information technology services should be very easy to use.

Most participants said that many information technology services are too difficult to use and require too much technical knowledge.

It was suggested that we strive for "ease of doing"—not of doing information technology but of doing job functions using information technology.

To do compressed video has to be as easy as driving to the site.

The biggest challenge is to make technology easier for people to use. A good example is the phone. People don't take a look at making a call and say "I think I'm going to use this piece of telecommunications equipment, look in the manual on how to use it, and punch in numbers and hope I get someone on the other side." Technology has to become transparent enough (through good software on the data side and a self service studio on the distance education side) so instructors can do what they need to and originate this by themselves.

It is important that the University provide incentives for innovation.

A few participants advocated changing the system of faculty and staff rewards so that innovative use of information technology is recognized in tenure, promotion, and salary decisions.

People should be encouraged to share expertise, and be rewarded for doing so.

Some participants suggested sponsoring cross-disciplinary seminars for the purpose of sharing knowledge.

Some said that there should be electronic forums (e.g., electronic bulletin boards, LISTSERVs and/or UseNet) that would facilitate sharing of knowledge.

We need a forum or mechanism to find out who does what—for example, satellite technology for distance education. Where do I go to find out about this?

...same with educational programs and software development. As a faculty member, I can't take the time to investigate to find out who's doing what....We need some mechanism. I learned more in 45 minutes discussing in [this focus group] what's going on than I've known in months.

Compensate departments for some of the time their people spend sharing unique expertise which helps others solve their technology-related problems.
Appendix 1

Background on Information technology Planning Project

Senior University management created an Advisory Users Committee (AUC) in 1992, asking this committee to create a vision of computing and information technology for the University and offer some preliminary strategies for achieving that vision. The AUC vision states:

We envision an electronic environment, a common space, that invites members of the University community to make use of distributed information technology in realizing our land-grant mission. In addition we wish to involve members of the community at large in this collaboration. This environment will be tolerant of diverse computing platforms, provide access to global information resources, and will value innovation. (August 12, 1992)

The vision and strategy document received endorsement from the President’s Cabinet, the Senate Committee on Computing and Information Systems, and the University Senate. The AUC shared the vision with academic units and key University information technology personnel by placing it on Gopher and sending copies of it via campus mail.

To implement the vision, senior management chartered an Information technology (InfoTech) Steering Committee, which recommended an approach that focuses on establishing the linkage between the University’s strategic requirements and its ability to use information technology to address the needs of academic and administrative units. Specifically, the Steering Committee recommended a five-step process for implementing the vision and initiated the InfoTech Planning Project. The table below lists the five tasks and the current working status for each task.

<table>
<thead>
<tr>
<th>Task</th>
<th>Working Status</th>
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<tbody>
<tr>
<td>Review University strategic direction</td>
<td>The InfoTech Team is communicating with the University Planning Steering Committee to ensure that customer information technology needs align with the University mission.</td>
</tr>
<tr>
<td>Assess customer needs for information technology</td>
<td>The Customer Assessment Group formed as part of the InfoTech Planning Project is conducting the customer needs assessment now. Focus groups and reports are completed.</td>
</tr>
<tr>
<td>Assess existing information technology investments</td>
<td>The Provider Assessment Group formed as part of the InfoTech Planning Project is conducting the central and distributed provider assessment now. Focus groups are completed and reports are in progress.</td>
</tr>
<tr>
<td>Develop strategic information technology architecture</td>
<td>The InfoTech Steering Committee will select people to develop the information technology architecture after the customer and provider assessment is completed.</td>
</tr>
<tr>
<td>Develop tactical implementation plans</td>
<td>The InfoTech Steering Committee will select people to develop tactical implementation plans after the customer and provider assessment is completed.</td>
</tr>
</tbody>
</table>
Appendix 2

Customer Council

The InfoTech Planning Team decided to form and work with a customer council in order to obtain input from customers of information technology. The Customer Council consists of 150 individuals nominated by their college dean or chancellor (up to a total of 4 faculty, administrative staff, technical staff, and students) or central department head/director (up to 3 members). Customer Council members were invited to participate in the project through involvement in focus groups and through Council meetings.

A smaller (19 members) subset of the Council, the Customer Council Liaison Group, was more heavily involved with the project by providing suggestions for writing final reports and providing feedback on drafts.

Customer Council members came from the following colleges/campuses and units:

<table>
<thead>
<tr>
<th>Colleges/Campuses</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>Carlson School of Management</td>
<td>Academic Affairs/Minority Affairs</td>
</tr>
<tr>
<td>College of Agriculture</td>
<td>Administrative Information Services</td>
</tr>
<tr>
<td>College of Architecture &amp; Landscape Architecture</td>
<td>Admissions</td>
</tr>
<tr>
<td>College of Biological Sciences</td>
<td>Alumni Relations</td>
</tr>
<tr>
<td>College of Education</td>
<td>Audits</td>
</tr>
<tr>
<td>College of Human Ecology</td>
<td>Boynton Health Services/U Counseling Services</td>
</tr>
<tr>
<td>College of Liberal Arts</td>
<td>Business Services</td>
</tr>
<tr>
<td>College of Natural Resources</td>
<td>Campus Health &amp; Safety</td>
</tr>
<tr>
<td>College of Pharmacy</td>
<td>Campus Master Planning</td>
</tr>
<tr>
<td>College of Veterinary Medicine</td>
<td>Computing &amp; Information Technologies</td>
</tr>
<tr>
<td>Continuing Education &amp; Extension</td>
<td>Development Office</td>
</tr>
<tr>
<td>General College</td>
<td>Disabilities Serv./Disabled Student Cultural Ctr.</td>
</tr>
<tr>
<td>Graduate School</td>
<td>Equal Opportunity &amp; Affirmative Action</td>
</tr>
<tr>
<td>Humphrey Institute of Public Affairs</td>
<td>Facilities Management</td>
</tr>
<tr>
<td>Institute of Technology</td>
<td>General Counsel</td>
</tr>
<tr>
<td>Law School</td>
<td>Housing &amp; Food Services</td>
</tr>
<tr>
<td>Medical School</td>
<td>Human Resources</td>
</tr>
<tr>
<td>Minnesota Extension Service</td>
<td>Management Planning &amp; Information Services</td>
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<tr>
<td>School of Dentistry</td>
<td>Media Resources</td>
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<tr>
<td>School of Nursing</td>
<td>Minnesota Supercomputer Institute</td>
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<tr>
<td>School of Public Health</td>
<td>Office of International Education</td>
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<tr>
<td>University College</td>
<td>Printing Services</td>
</tr>
<tr>
<td>University of Minnesota, Crookston</td>
<td>Recreational Sports/Student Union</td>
</tr>
<tr>
<td>University of Minnesota, Duluth</td>
<td>Registrar</td>
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<td>University of Minnesota, Morris</td>
<td>Research &amp; Technology Transfer Administration</td>
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<td></td>
<td>Student Financial Aid</td>
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<td></td>
<td>Telecommunications</td>
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<td></td>
<td>University Art Museum</td>
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<td>University Hospital and Clinic</td>
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<td>University Relations</td>
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<td>University Services</td>
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Appendix 3

Description of Focus Group Process and Participation

Focus Group Methodology

An outside consultant, Marsha R. Mueller & Associates, was hired to moderate the focus groups. Mueller has a master's degree from the Department of Social Science, University of Chicago. Her skills include work in program quality assurance, policy analysis, program evaluation, applied research, adult education, strategic planning, and group facilitation. Her professional background includes program management experience at The Pennsylvania State University and University of Illinois, along with research and evaluation work at the University of Minnesota.

A pilot focus group was conducted; some of the original focus group questions were changed based on this pilot. Focus group participants completed a pre-focus group survey which requested that they read the 1992 Advisory Users Committee (AUC) Vision and begin focusing thoughts on their information technology needs.

During each focus group, assistant moderators (InfoTech Planning Team members) took notes and tape recorded the session. After each focus group, assistant moderators collected the completed pre-focus group surveys, re-listened to the tapes, reviewed their notes, and created organized notes. The organized notes maintain confidentiality in informants' responses and include information from the pre-focus group surveys. The consultant provided feedback on all organized notes.

One team member then took the organized notes from a functional area (i.e., instruction, administration, student, research, or outreach) and drafted the report for that area, incorporating feedback from the consultant, InfoTech Planning Team members, and Customer Council Liaison Group members.

Focus Group Attendance

Some people attended more than one focus group. A total of 98 individuals participated in the focus group process. Focus groups were initially scheduled for the month of August, but scheduling was expanded through October 4 to accommodate faculty and students who were gone during the summer.

<table>
<thead>
<tr>
<th>Number of Focus Groups</th>
<th>Attendance</th>
<th>Surveys Collected</th>
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</thead>
<tbody>
<tr>
<td>Administration</td>
<td>6</td>
<td>49</td>
</tr>
<tr>
<td>Instruction</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>Outreach</td>
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<td>17</td>
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<tr>
<td>Research</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Student</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
<td><strong>119</strong></td>
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</table>
Appendix 4

Pre-Focus Group Survey and Focus Group Questions

Below is a condensed version of the pre-focus group survey and a list of the focus group questions. Marsha R. Mueller & Associates worked with the InfoTech Planning Team to develop the survey and questions.

Pre-Focus Group Survey

Part I. This part involves reacquainting yourself with the August 12, 1992 Vision and Strategy for Computing and Information Technology. Please read the document carefully.

Part II. This part focuses on your current and anticipated information technology requirements.

Current Requirements. Think about your work and how information technology supports what you do. List the information technologies you count on now to support your work at the University. (Please be as specific as possible.)

Future Requirements. Think about how you anticipate your work will evolve over the next 5 years and what you expect to accomplish. In what ways will your information technology requirements change over the next 5 years?

Future Requirements (students). In what ways do you feel student requirements for information technologies will change over the next 5 years?

Part III. This part seeks your assessment of specific parts of the Vision and Strategy statement.

For the vision statement

• To what extent do you feel the vision statement is on target? (In other words, does the statement adequately reflect where information technology needs to be 5 years from now to support high quality, globally competitive work at the University?)
• What changes in the statement, if any, would you recommend? (Please describe.)

For each of the six objectives in the vision statement, participants answered the following questions

• How important is this objective in reaching the vision of information technology at the University?
• What changes, if any, are needed in this objective? (For example, is anything missing and/or should some parts be deleted?)
• Are there other objectives which you feel should be added to this list? (If so, please describe.)
For the Graphic Representation of The Commons
Please assess this visual by responding to the following questions:

(1) Is it clear to you what this visual is illustrating?

__NO __ YES⇒If yes, what does the visual represent to you? (please describe)

(2) Does this illustration adequately reflect the vision statement and objectives?

(3) In what ways should this illustration be modified or changed to communicate the vision statement and objectives? (Please describe or draw your recommended changes.)

Part IV. This part asks you to identify current information technology projects that you consider to be particularly innovative and/or interesting.

Please list any information technology projects (within or outside of the University) that you think are particularly innovative or interesting. The projects you list should be ones that you feel should be looked at for possible use at the University. In addition, briefly note the attributes of the project that make it innovative or interesting.

<table>
<thead>
<tr>
<th>PROJECT (Name/sponsor, brief description)</th>
<th>EXCITING ATTRIBUTES</th>
</tr>
</thead>
</table>

Focus Group Interview Questions

Questions focusing on current work environment/information technology use

What does Information technology mean to you?

I would like you to think about the environment, or context, in which you do your work. If you're like most of us, there are factors in our work environment, factors more or less outside of our control, which can either enhance or limit our effectiveness. What are some of the key factors, or attributes, of your work environment that you feel significantly enhance the overall effectiveness of your work?

We've been discussing your current work environment. I would like to know more about how information technology fits in to the work that you do. Tell me about the information technologies you consider to be essential to your work and how you use them.

Today information technology is supported and managed in different ways at the University.

- Based on your own experience, what works? What aspects of the current way information technologies are handled do you think are effective and should be maintained?

- What about factors which limit your effectiveness? What are some of the key factors of your work environment which limit the effectiveness of your work? What aspects of the current way information technologies are handled do you think are not working and should be changed?
Questions focusing on future requirements

All of you spent a substantial amount of time completing the pre-interview survey. One of the questions asked you to think about how you expect your work to evolve over the next 5 years and what you want to accomplish. One question in particular, asked how your information technology requirements will change.

- What do you see as key challenges in the next 2-4 years?
- In what ways will your information technology requirements change over the next 5 years?

Getting where you want to be 5 years from now means that progress must be made along the way. From your perspective, what must the University do in the short term, let's say within the next 2-4 years, to enhance the likelihood that you'll meet your information technology requirements 5 years from now?

Questions focusing on vision/objective statements

I want to change topics somewhat for our final questions. Up to this point we've been discussing your current and future requirements. Before coming today you had an opportunity to re-read the vision and objectives statement.

What is your reaction to the vision statement? Based on how you see your requirements now and in the near future, does the statement make sense?

What was your reaction to the objectives? Are those the smart things to be doing if the University is to fulfill its vision? Should the objectives be changed in anyway? Is anything missing?

What is your reaction to the visual (i.e., of the Commons)? If you were the designer and decision maker, what would you include in the Commons and what would you exclude?

Can you tell me about any exciting projects that you are involved with or familiar with?

Do you have any final comments you would like to make about the future of information technologies at the University?
Appendix 5

Members of Information Technology Planning Project

**Information Technology Planning Project Steering Committee**

- Tim Fitzpatrick, Administrative Information Services
- Linda Jorn, College of Agriculture/Instructional Computing
- Charlene Mason, University Libraries/Automated Systems
- Mike O’Connor, Finance and Operations/Operations Development
- Don Riley, Academic Affairs/Computing and Information Technologies
- George Wilcox, Medical School and Supercomputer Institute

**Information Technology Planning Project Team**

- Roberta Armstrong, Student Affairs Information Systems
- Jim Colten, Computer and Information Services
- Jodie Berg Combs, Administrative Information Services
- Larry Dunn, University Networking Services
- Judith Howe, Administrative Information Services and The Graduate School
- Linda Jorn, College of Agriculture/Instructional Computing
- Charlene Mason, University Libraries/Automated Systems
InfoTech Planning Project
Customer Needs Assessment

Research Summary

Prepared for:
InfoTech Planning Steering Committee
InfoTech Planning Customer Council Members
InfoTech Planning Provider Council Members

Prepared by:
Assessment Group
InfoTech Planning Team
University of Minnesota

January, 1994
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<td>Purpose of Customer Needs Assessment</td>
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Audience for and Purpose of this Document

**Audience**
This summary was prepared for the InfoTech Planning Steering Committee, Customer Council Members, Provider Council Members, and people who will be involved in the next step of the InfoTech Planning Project.

**Purpose of this Document**
This document provides a detailed summary of information that key informants about information technology at the University of Minnesota provided during research focus groups. The focus groups were conducted as part of the Information Technology Planning Project.

For readers who are not interested in the amount of detail provided in this document, a summary of major findings across all five functional focus groups (administration, instruction, outreach, research, and student) will be available early in 1994.

The following are provided in this document:

- a **background section**, which describes the Information Technology Planning Project,
- an **executive summary**, which highlights key findings, and
- a **findings section**, which details participants' focus group comments.

Read the findings section if you want to:

- understand and read about specific examples of how researchers are using information technology,
- learn what researchers think is working and is not working in terms of information technology,
- understand what researchers view as key information technology challenges and next steps the University should take in order to meet researchers' information technology needs,
- make informed budgetary and organizational decisions during your unit planning cycle in order to meet information technology challenges facing researchers, and/or
- improve current information technology services.

**Other Focus Group Summary Reports**
If you wish to acquire or read summary reports from the administrative, outreach, student, or instructional focus groups, or if you need the reports in alternative format, please contact:

Office of the Associate Vice President for Academic Affairs/Academic Computing & Information Technologies
University of Minnesota
8 Morrill Hall—100 Church Street SE
Minneapolis, MN 55455
Telephone: (612) 626-9816.

Text of the reports also appears on the Internet Gopher. The path is:

\Home Gopher Server
|University of Minnesota Campus Information
|University Planning
|Information Technology Planning
|Customer Assessment Reports.
Senior University management created the Advisory Users Committee (AUC) in 1992 and asked this committee to create a vision of computing and information technology for the University of Minnesota. In August, 1992, the AUC created a vision statement; senior management then chartered an Information Technology (InfoTech) Steering Committee which recommended a five-step planning process to implement the vision:

- review University strategic direction
- assess customer needs for information technology
- assess existing information technology investments
- develop strategic information technology architecture, and
- develop tactical implementation plans.

The InfoTech Steering Committee established the InfoTech Planning Team which has reviewed University strategic direction, assessed customer needs for information technology, and assessed existing information technology investments. Several documents have been created that report on customer needs for information technology and provide details on existing information technology investments. These reports are being distributed Winter Quarter 1994 and will help to guide decisions made in the next step of the Information Technology Planning Project. (See Appendix 1 for more background information on the Information Technology Planning Project.)

The customer needs assessment has two purposes: (1) validate the AUC vision with University units, and (2) assess University of Minnesota customers' needs for information technology.

This information will help guide decisions made in the next step of the Information Technology Planning Process, and will also be shared with providers of information technology at the University for their planning use.

**Key Informants.** Key informants of information technology were nominated by their collegiate, campus, or unit administrator (see Appendix 2 for list of units) to form the Customer Council. Customer Council members attended meetings and participated in focus groups, and will fill out a survey (described below). A smaller (19 members) subset of the Council, the Customer Council Liaison Group, was more heavily involved with the project by offering suggestions for writing final reports and providing feedback on drafts.

**Customer Council Meetings and Liaison Group Meetings.** Customer Council members attended three meetings where they were informed about the planning process and listened to invited speakers discuss future information technology trends. Liaison Group Members attended several meetings where they provided feedback on draft reports and discussed the information technology planning process.

**Focus Groups.** Focus groups were conducted in order to validate the vision and assess customer needs (see below for further detail; a comprehensive description of the process and participation is also provided in Appendix 3).
Survey. Early Winter Quarter 1994, a survey of the Customer and Provider Councils will be conducted that will produce ratings to be used in developing a ranking of steps the University should take in the next 18-24 months to meet customers' needs for information technology.

Focus Group Purpose
The purposes of the focus groups were to:

- understand users' current work environment and information technology use as well as their future information technology requirements
- understand information technology users' reaction to the AUC vision
- obtain a list of exciting information technology projects.

Focus Group Process
There were 21 focus groups conducted from August through October, 1993. An outside consultant was hired with skills in strategic planning and focus group facilitation to moderate the focus groups (see Appendix 3 for further consultant credentials). Key informants self-selected into the following functional roles and attended corresponding focus groups: administration, instruction, outreach, research, and student.

Focus group participants completed a pre-focus group survey and answered a set of common questions during the focus groups. (See Appendix 4 for pre-focus group survey and focus group questions.) The InfoTech Planning Team members conducted a rigorous, reiterative process for synthesizing data from the focus groups. (As noted above, Appendix 3 provides more detail on this process.)

About the Research Focus Groups
Four research focus groups were conducted with 16 participants during August and September, 1993. Eight surveys were collected from the 16 participants in the research groups.

Participants were well informed about information technology issues and, in several interviews, there was intense and even opinionated discussion. Responses included individual participant replies to moderator-initiated questions and group-generated discussion. Attendees represented a broad spectrum of individuals involved in research: faculty, administrative personnel, computer support personnel, and librarians.

Future Reports
One other customer assessment report has been written and is being sent to Customer and Provider Council members, administrators who nominated Customer Council members, the Senate Committee on Computing and Information Systems, and the President's Cabinet. This report summarizes major findings across all five functional focus groups. Additional copies of this report will be available early in 1994.

A concurrent assessment of existing University information technology investments is being conducted and a report on these findings will be available early in 1994. Lastly, a report which combines customer and provider assessment summaries will also be available early in 1994.
Executive Summary

How Participants Talk about & Use Information Technology

- Information technology includes access to data and information, communication, and interaction with people.
- Information technology includes both technical and financial support as well as politics.
- People need to communicate their research.
- Researchers need to write grant proposals.
- Researchers use highly specialized hardware and software.
- Information technology is integrated into work.
- People also conduct institutional research.
- Access to networks is key.
- Access to multiple technologies is vital, although disciplines differ in their needs.

What's Working Now? What's Not Working?

Participants were asked to identify information technology that was working at the University (and, thus, should not be changed), and to tell about information technology that should be improved. Information technology advances have brought new concerns and problems. There is a high sense of anxiety whether or not human and financial resources will be available to help users meet demands of technological change.

Responses are categorized into five areas: Base Services (Network/Access, Hardware, and Applications & Information), Support Services (Reliability, Problem-resolution Services, and Training), Policy/Standards, Organizational Structure, and Human Resources.

Base Services
Participants made no strong positive statements about the network.

Participants noted that there is a need for better authentication, security, and confidentiality on the network. In terms of hardware, participants noted that the assistance offered through Computer and Information Services' Engineering Services was good, timely, and cheap. People noted that they want better physical security for personal computer equipment and better support for the entire process of purchasing computers through the Bookstore.

In terms of application and information, participants noted the following as working:

- Machine Readable Data Center
- large government databases
- site licensing of software
- good quantity of information for administrative research
- library information
- Gopher
- move towards client/server architecture for administrative data, and
- electronic mail (E-mail) accounts.

Participants also noted some things that are not working with applications and information at the University. Researchers clearly stated that they need better information technology support for managing research projects, collaboratively creating proposals, using on-line forms, and managing the financial aspect of their research. In addition, researchers noted that it is difficult to obtain answers to institutional research questions because it is difficult to access the current databases, plus data is in paper form and needs to be re-entered in order to work with it.
**Support Services**
Participants noted that University Networking Services is responsive and helpful, that student laboratory consultants at Duluth are reliable, and that distributed computer systems in some colleges are reliable. Participants stated that problem resolution depends upon human technical support—both in central organizations and in local units—and noted that support people do a very good job but are spread too thin. People suggested that local support efforts could relieve central information technology organizations of workload, and central dollars should be awarded to accomplish this.

Problem areas in the support services area include the need for effective back-up services for distributed data that takes into consideration network bandwidth and security/confidentiality issues. Participants also want timely support to help them complete tasks faster and more efficiently, and to fix hardware problems. Participants want trainers to focus on the users' wide range of needs including keeping up with rapid changes in technology and a variety of hardware/software. (People indicated that they want one place to "complain," noting that various offices run "gripe lines.") Finally, participants noted that there is a need to promote and explain available services and resources in order to ensure better utilization of existing hardware, software, and services.

**Policy/Standards**
Participants stated that free access to public computer laboratories is working.

Participants also noted the following:

- Central services should attempt to settle on standards that help alleviate incompatibility issues between personal computer/workstation platforms, between various software products, and even between different release versions of the same software products, then inform the University community of these standards. Participants noted that site licensing could help with the cost of upgrading software.

- There are inconsistent ways in which departments are able to fund initial networking, hardware, and software, as well as ongoing maintenance costs. In addition, people are not aware of the total life cycle costs of technology.

- Current funding models and University and federal research policies are barriers to obtaining the needed computing and information technology that is an essential part of conducting many kinds of research.

**Organizational Structure (central and other)**
Participants had no comments concerning what is working with the organizational structure for information technology.

Participants did note that they have experienced problems when trying to identify which unit does what on campus. Participants noted that changes made by central administrators impact the users, and requested that central administration inform users of changes in advance of implementation so as to assess the impact on users and units. In addition, participants want the information technology planning process to be completed so people can have something to guide their own information technology decisions.

**Human Resources (reward, recognition, career path)**
Participants had no comments concerning what is working with the human resources issues for information technology.

Participants did emphasize that one of the key purposes of information technology should be to support and enhance the productivity and effectiveness of all staff including faculty. This suggests that faculty effectiveness, both now and in the future, will be shaped by their ability and willingness to make use of information technology. Participants noted that incentives will be needed to support change and create a sense of urgency about the need for this change.
Key Challenges

Several key challenges surfaced when participants were asked to discuss future key challenges the University needs to address in the next 2-4 years in order to meet users’ information technology needs. Participants also noted next steps that the University could take in order to meet these challenges. The identified key challenges and suggested next steps are listed below.

• The University must systematically monitor the competition.

• Improve the network to provide for remote access, carry high resolution images, and support real-time collaborative research.

• Provide up-to-date supercomputing and high-powered workstations central to research work.

• Emphasize enhanced quality and timeliness of access to information.

• Identify classes of users and design support programs which optimize the effectiveness of each class of users.

• Provide users with vast, manageable amounts of storage and archival space for data and network bandwidth.

• Provide new funding models.

Next Steps

• Make decisions and implement processes with the purpose of assessing the users’ needs, supporting the effectiveness of users, and providing accountability to the faculty and community.

• Establish a base level of information technology access and hardware standards for everyone that is paid for centrally.

• Provide strong leadership that will review and clarify organization, management, and service delivery of University information technology.

• Coordinate purchase and selection of hardware and software.

• Provide easy access to information, easy data transfer, and easy communication across multiple platforms.

• Provide full functioning electronic processing for grants.

• Provide staff training.

• Decide on new funding models to support users’ information technology needs.

• The University needs to support distance education.

• Provide additional hardware to improve research, classroom, and student computing environments.
Findings

The Findings section in this document is divided into three categories:

How Participants Talk About & Use Information Technology
This section describes how participants define information technology and how they use it in their work. Focus group participants provided many examples demonstrating that information technology is supporting the University’s mission.

What is Working Now and What is Not Working
This section contains participants' views on which aspects of information technology at the University work well and which do not work well. Participants frequently identified aspects of information technology as both working and not working. For example, some participants stated the network works quite well, while others stated the network is not truly effective because it is inaccessible from too many places.

Key Challenges and Next Steps
This section describes what participants discussed as key challenges for meeting their information technology requirements. Also listed are next steps that participants stated the University should implement in order to enhance the likelihood that their information technology requirements would be met.

Note: In this section of the document, the words “few,” “some,” and “most” have been used in order to help the reader understand how many people discussed an idea or made a comment during the focus group sessions. The word “few” means that the idea was discussed or comments were made in one focus group, “some” means in two focus groups, and “most” means in three or more focus groups. Material in italics is quoted information from the focus group sessions.

How Participants Talk About & Use Information Technology

Descriptions of information technology cover multiple attributes.

Participants were asked to discuss how they think about and describe the term information technology. Multiple attributes of the concept were mentioned by respondents: access and exchange of information and databases with colleagues around the world, database searches, graphical presentation of data, communication, and technical support. In addition, some participants discussed financial and political issues associated with information technology at the University.

Participants also provide detailed examples of specific technologies that are vital to their various disciplines. The list below provides examples of these multiple technologies.

Hardware:
scientific computing—supercomputing (Cray and CM-5) and high performance workstations; PC's and Macintosh's; Sparcstation for researcher, graduate students, and undergraduate research students; modem pool;

...the simple business of communicating with your neighbor up in the college or down the hall as well as halfway across the world...If we need to correspond with colleagues in New Zealand, which certain faculty are doing, it is where we need to exchange information—and we may need to exchange information between a large number of people.

If the University is going to put us on networks and rely on it, you have to support it and it is not cheap. Once you start to rely on it, you are stuck with it.
Software:
specialized software for research; computer aided
design; statistical packages; computer designed
music;

Personal computer software:
Statistical Package for the Social Sciences; word
processing, spreadsheet; database; graphics,
bibliographic software (e.g., ProCite),
graphics for presentations;

Services:
electronic mail; creation of slides and prints from
electronic files; on-line interactive searches of
databases; orders to University Stores; CUFS
accounting; financial reports produced by
department; LUMINA; and
University databases:
access through Administrative Information
Services (AIS) (e.g., financial systems,
student demographics) or developed from AIS
databases (e.g., retention rates, enrollment,
course load reports), large political science
databases.

Research participants report pervasive use of multiple technologies.

Participants provided many detailed examples
which describe the pervasiveness and necessity of
having access to multiple technologies in order to
conduct research. Researchers emphasized
that they need:

highly specialized hardware and software
to support their research. For example, one
associate professor maintains a research group of
4-8 graduate students conducting research in
cellular and tissue engineering. This work involves
mathematical modeling and analysis, large scale
scientific computation using workstations
(purchased by grant money), and Minnesota
Supercomputer Institute (MSI) services.

technology that allows them to visualize
data. A researcher in Forestry discussed the strong
need for visualizing data and the need to use
Geographical Information Systems (GIS) that
require capabilities above and beyond desktop
computers. Other researchers noted that they need
video images captured and stored in digital form.

Computers and information exchange are
important...word processing and general
communication with other students and researchers
elsewhere...writing and distributing information
are important.

What does information technology mean? Politics.
People who are dedicated to making the whole
system better are being badgered by every
conceivable thing in the system. They are
dedicated people and everybody asks them to do
something and they're sitting there in their office
trying to decide on priorities without having a sense
of knowing where the school or University is
going.

Data analysis and graphics are also important
components of the research process.

I can stand alone with my research, but we want to
communicate results.

Increasingly important are networks and
interconnectivity to allow relationships dealing with
other researchers on campus and other ways to talk
with researchers on sabbatical in Europe.

If we didn't have networks, we definitely would
not make as good progress with research as we are
now.

A simple communication technology would be the
cellular phone. It would be handy for field
researchers. A person could make a lot of calls
during a 1 1/2 hour drive to a site.
networks that allow daily activities in research communication and collaboration with colleagues around the world. One researcher described his need to transfer to someone's Iris in UCLA or possibly Michigan an animation of what a protein does over a long time; and that this takes up 1 GB of space and currently UNIX is the fastest way to transfer this data. Another researcher noted that the mailer can't handle large files and the machine locks; that technology is the problem but it can be solved. Participants also discussed using E-mail and transmitting graphics to collaborate with colleagues around the world.

departmental access to the network. One participant noted that not all departments in their college were networked and that this impedes communication and data exchange. They want more interdisciplinary research and feel the network will allow this. Participants discussed many reasons for why it is key to have access to the network:

- a local area network helps provide up-to-date software and affordable Internet access, exchanges of files, data storage, back-up and electronic mail;
- Telnet, TN3270 and FTP provide access to Administrative Information Services and Computer and Information Services for research and instructional computing;
- Gopher allows access to shareware;
- and finally, participants stated that networks allow high speed transmission of images and live conferences with overseas colleagues for conducting research in real time.

remote access to the University network and to computers. Researchers noted that it is important for graduate students to have access to computers and networks from their office, labs, or home. For example, Forestry students use computers in the field to log data, and currently need to move to another location to produce slides and graphics.

technologies that facilitate the grant writing process. Researchers noted that the grant proposal process is a long one which can be facilitated by using technology.
access to information that supports institutional research. One participant discussed that institutional research is an important type of research conducted at the University. For example, people support research which supports budget related questions, such as ratio for faculty/student credit hours.

For example, we find answers to the question “What is the funding level of the college compared to other college units at the University or other liberal arts colleges in the Big Ten or other peer institutions in the country?”

What’s Working Now? What’s Not Working?

Participants were asked to discuss what they feel works and doesn’t work in the way information technology is supported and managed at the University. In all interviews, there was general recognition that major advances have been made during the past 15 years. However, the overall tone was one of ambivalence; participants could not talk about what is working without talking about what is not working. In this report, we have separated the comments on what is working and what is not working, simply for ease in reporting data.

Participants’ comments from all focus groups—administrative, instructional, outreach, research, and student—tended to fall into five general categories:

1. Base Services
   • Network/Access
   • Hardware
   • Applications and information

2. Support Services
   • Reliability
   • Problem-resolution Services
   • Training

3. Policy/Standards

4. Organizational Structure (central and other)

5. Human Resources

The following two sections detail what participants in the research focus groups think is working or not working. Participants’ comments have been categorized under the five general areas listed above.

What’s Working Now?

There is general recognition that major advances and big steps have been taken during the past 15 years. Most things work adequately well; there are significant new initiatives in information technology on campus.

Base Services: Networks

Participants did not have any comments on what is working with networks in terms of research computing.
**Base Services: Hardware**

One participant stated that Computer and Information Services' Engineering Services are good, timely, and cheap.

**Base Services: Applications & Information**

Participants provided specific examples of applications that work and information that is useful. Participants noted the following as working: Machine Readable Data Center; large government databases; site licensing of software; good quantity of information for administrative research; library information; Gopher; move towards client/server architecture for administrative data; and electronic mail accounts.

**Support Services: Reliability**

Participants stated that University Networking Services is responsive and helpful, that student laboratory consultants at Duluth are helpful, and distributed computer systems in some colleges work.

**Support Services: Problem-resolution Services/Help Lines**

One participant stated that a lot depends upon human technical support—both in central organizations and in local units—and that support people do a very good job but are spread too thin. Another participant stated that local support efforts relieve central information technology organizations of workload and therefore the departments should receive central dollars. This participant stated that the heavier your use of information technology, the more you need local on-site support people.

**Support Services: Training**

Participants did not have any comments on effective training for research computing.

**Policy/Standards (pricing, other)**

One participant noted that free access to microcomputer labs is a major step in the right direction.

People are exchanging information like we never could before; we are accessing information. That's working.

Our college distributed computer system is working well and covers our research interests. It can be improved and upgraded, but it is well ahead of other institutions.

They know us and they know what we do.

New computer labs built and removal of computer fees are steps in the right direction.
Organizational structure (central and other)

Participants did not have any comments on what is working with the organizational structure for information technology at the University.

Human Resources (reward, recognition, career path)

Participants did not have any examples of career path, rewards, and/or recognition models that are effective for the support of research computing.

What's Not Working?

Advances have brought new concerns and problems. A sense of anxiety was expressed by many participants about whether or not human and financial resources will be available to help users meet demands of technological change. For many participants, having access to cutting edge technology is critical to maintain their professional credibility and cutting edge standards of research.

The problem with these pluses is to maintain the plus. We can't sit back and stay where we were five years ago or pretty soon it equals a minus. It's a constant fight to keep what you have and keep moving forward.

Base Services: Network

Participants discussed the need for authentication, security, and confidentiality. Participants discussed the issue of security and noted that the network is not really secure, but that available security systems are a real problem to work with, so the University doesn't use them; personal computers and UNIX workstations were not designed for security; and that mainframe systems are better but only marginally so.

One person noted that electronic mail is easily forged and another noted that the lack of a signature verification makes it difficult to move to electronic forms.

Base Services: Hardware (security and purchasing services)

One participant noted that there is not adequate physical security for personal computer equipment.

We have cubicles, not offices, and they are not secure. Students are reluctant to bring computers to school, so students who have personal computers work at home.

A few participants discussed that Bookstore sales of computers are a problem. They noted that it is difficult to get help from the Micro Help Line about a purchase and noted that in addition there are long waits to purchase things because inventories are not kept. A suggestion was made for a central purchase consulting service to address these problems.
Base Services: Applications & Information

Some participants noted that better information technology support is needed for grant application and grant management. Some participants noted that they need the ability to create and collaboratively work on grant proposals. In addition, participants noted that after a grant is awarded support is needed to manage the financial aspects of research projects. Participants noted that they need both timely and useful information and want on-line entry and automated forms. With this type of information technology support, participants noted that they could be more efficient, make better use of their time, and focus on their research rather than on their management of it.

A few participants noted that it is difficult to access institutional databases. Participants noted that it is difficult to get information because the format makes it difficult to access the data and data in paper form must be re-entered. Participants noted that this makes it difficult to obtain answers to institutional research questions and increases the cost, as re-entering of data can be costly.

As an example, a participant stated that if one college wants to know graduate retention rate, academic preparation, or full time vs. part time status of their students, they have to pull up a lot of information from different databases and then massage the data. This participant wants a canned program that would take the parameters and go retrieve the data.

You can do electronic proposals, but you need a lot of resources—both in the ORTTA shop and on the faculty research side. In order to make it work, we need to make it happen. We have ideas, but we need resources to make it happen...Some people don't have resource people and when you are on a deadline, you can't take one week to learn.

It would be nice to have CUFS links that work, to really find out how much you've spent on research accounts. It would be well worth the University expenditure to do this. Several faculty don't know where they are with research budgets. They either can't understand reports, or numbers don't make sense due to periods being used. Need on-line user-friendly software for the Principal Investigator to put in information. Forms and processes are very awkward. Several faculty keep their own shadow systems to have an idea of what is going on.

There needs to be a better capability for researchers to send in documents whether they are travel authorizations or equipment orders. Forms could be automated and doing it by electronic mail could eliminate three levels of bureaucracy.

Unfortunately, it is difficult to get access to some of this information other than in paper form. [One unit] has some information from [a cooperative] data exchange—almost always in paper form and then this has to be re-entered and analyzed. Eventually, I envision a process where there is enough cooperation [among] the universities to exchange information electronically or [it is] available to be accessed from another institution with authorization. The current mechanisms and mainframes available are clumsy and awkward. Through years of experiment and training, I am able to do it, but if I turned it over to someone else to do, it would take some time to get someone to use it.
Support Services: Reliability

Data security/integrity. A few participants noted that there needs to be an effective back-up service for distributed data. For example, one participant discussed how he supports customers who have a total of 33 gigabytes of data. Participants stated that most users are totally unaware of the data security and integrity problems they face. Participants also emphasized that historically central systems have been best at providing effective back-up and disaster recovery service, but in a distributed environment there are network bandwidth and security/confidentiality issues which need to be considered, also.

Support Services: Problem-resolution Services/Help Lines

Some participants noted that responsive, informed, customized problem resolution/help services are needed. Participants discussed support in many ways. For example, participants noted that they need support to help them complete tasks faster and more efficiently and to fix hardware problems. One participant noted that not every department will need technical support, but most people disagreed and stated that since technology changes so fast and departments have such a wide variety of hardware and software, departmental support will be needed. Participants stated that there is a wide range of user levels—word processing to Supercomputing—that requires support at the departmental level. Participants discussed how technology providers, whether central providers or distributed providers, need to focus on users.

One participant noted that there is no one place to complain. This participant stated that some places run a “gripe line” staffed by the community at large, with varying success.

Find ways to get technical support in two ways: 1) appoint person to explore the problem while completing a task; 2) get basic technical support for hardware.

The University hasn’t come to grips with the fact that we have moved into a new era. You can’t always call Micro Help Line; your problem is right now and immediate. Whether higher level, e.g., supercomputing, or using word processing, spreadsheets, and databases, there is a continuum in terms of people, depending on the department, but the University has to have that resource and staffing in the department, both in small and large departments.

From my perspective, it is critical to have someone to deal with on a day-to-day basis. Things won’t stay the same no matter how simple. Not everyone will move up to the latest and greatest. Some people have major budgetary constraints and will get cast-offs. At the high end, people get the latest thing to work with.

There should be some kind of central complaint line that could send your complaint to the right people....for instance, I got this new version of [packaged software] that could do this thing I wanted to do and I loaded it on my computer and wiped out my hard disk. So I want to complain about this. Who on earth do I complain to? I can’t go over and stand around at the Help Line because I don’t feel the complaint is going to go to the right people....I needed someone to help restore my hard drive. I needed someone to make sure this software didn’t get distributed to other people and wipe out their hard drives and I needed someone to deal with the financial aspects of refunding my money.
Support Services: Training

Participants discussed the need to enhance faculty awareness of information technology and enhance faculty use of existing information technology. Participants noted that faculty effectiveness and productivity both now and in the future will be shaped by their own ability to make use of information technology. Participants noted that there is a need to promote and explain available services and resources in order to ensure better utilization of existing hardware, software, and services. In addition, participants stated that people need to be taught how to manage the technology.

There are lots of resources available for computing and software, but they don't do a good job of promoting electronic mail, databases. Outside vendors do a good job of marketing. Every week I get mail on new benefits of the product [a database commercially vended].

How do you make use of resources out there, especially with teaching? It's hard to know where to learn how to develop a Gopher server. I went to a computer summer camp. In terms of developing a Gopher server, you can do this and there are the numbers to call. Well, that never came through my mail! I'd never heard of this before—that I could pull this off. We acted on this information instantly. The same thing is true for generating classroom electronic mail accounts. I don't have any mailing on this. I have a phone number that I can call because of a specific event that I attended and, because of its nature, was too much for 99% of the faculty to attend. Four days is a lot to commit and that is where the information is. We are not getting information in terms of what is possible, so it is hard to make use of what is here to its fullest.

Personally, I was long resistant to electronic mail because it felt like another hook in my flesh where people could reach me. It's bad enough to have a phone that's worse than the mail. I can understand those things. But on the other side there are advantages. But the trick is how to manage the upside and minimize the down side on these things. Just having a network is no big deal, if it doesn't do you any good.

Policy/Standards

A few participants discussed the need to address the issue of standards. Participants discussed incompatibility issues between personal computer/workstation platforms, between various software products, and even between different release versions of the same software products. Participants noted that problems of incompatibility get even worse with multi-media work. In terms of solutions to incompatibility issues, participants stated that site licensing could help with the upgrade cost barrier. Participants also noted that Central Services should attempt to settle on standards, but even when this has been done in the past, people often are unaware of it.

Incompatibility! Huge problem, I can't take more than one step in any direction without getting incompatible with somebody—incompatibilities between programs on the same computer, between electronic mail, between me and the person who has their office right next to mine. Incompatibility exchanging manuscripts with my colleague in Georgia. Incompatibilities with information between us and the Minnesota State University System. Incompatibilities between IBM's and Mac's. Incompatibilities in every direction I can probably take a step....
Some participants discussed funding issues. Participants noted that there is a lack of consistent funding between departments; there is no consistent way in which departments are able to fund initial networking, hardware, and software, and ongoing maintenance costs; and that people are not aware of total life cycle costs of technology, such as replacement and purchase consulting costs. Participants emphasized that this creates a barrier to communication and interdisciplinary research.

Funding issues are always an issue, whether it is department or college, university, or individual. A lot of research money supports the teaching mission because the teaching money has shrunk. A lot of funding agencies are reluctant to buy computer equipment. They view that as a University function. So you run into a "Catch 22." Now, I've decided that software and so on have to go into grants, because departments won't pick that up. But you do run into a thing where a funding agency wonders why you are spending $4,000 on a computer. Granted, you don't need a new one in every grant. But every two to four years you need to upgrade that equipment.

I have trouble between ORTTA and our department. I cannot charge for maintenance and one of the goals in our department is to provide three years of maintenance when you buy anything. We have some software for which we would like to sell tokens, but I don't know how to collect for that. The system—neither CUFS nor ORTTA—won't let me.

A few participants emphasized that there is not adequate funding at the University to support computing and other information technology that is an essential part of conducting many kinds of research. These participants noted that they are in a “Catch 22” because often researchers are not allowed to write information technology costs into grant applications, and past models of funding information technology through research grants (even to the point of “taxing” grants) and special funds may not be an effective model for the future. Participants noted that when they consider alternative models for funding, they find many barriers in University and federal research policies and systems.

A few participants noted that central planning needs to discuss options that affect budgets and work tasks with users before implementing changes.

Organizational Structure (central and other)

Some participants discussed that the purposes, organization, management and service delivery of University information technology must be reviewed and clarified. Participants discussed, in detail, problems they experience in identifying sources of assistance (what unit does what), and obtaining useful, timely advice to address their information needs. In addition, participants noted that University information technology service centers should be assessed on the extent that they improve the efficiency, effectiveness, and productivity of users.

....If you are new, you don't have the foggiest. I still don't know what the total resources are. At least I know what a few of the resources are. It does not have the impression that we are centralized in any sense. It feels...segregated and, in fact, dealing with things like Gopher, electronic mail, or Micro Help Line, the sense is still there that this is non-coordinated, individual fiefdoms, and as each project comes up, we contact a separate set of people.
Some participants noted that users need both to be informed of changes made by central providers of information technology and provide feedback about these changes. Participants also discussed that decision makers must make better efforts to anticipate and understand impacts of policy changes on users and units. For example, participants discussed the recent change to maroon/gold on electronic mail and the impact this had on staff regarding their ability to “unsubscribe” from lists and letting their colleagues know about the change in their E-mail address.

A few participants noted that the information technology planning process needs to be completed so people have something to guide their own information technology decisions.

The University tends to be reactive—helps you figure out problems—but they won’t come and say here is what we have. It requires resources to be proactive.

You’ve made a big point. There are all these different computing centers around campus, and I know that we are now trying to get them all communicating...and to get them to coordinate. Historically around this institution, computer centers have not been this way; this computer center did this thing, and this computer center did that thing and nobody talked to each other.

With computer networks information goes so fast, so processing what is the right information and who really knows what they are talking about is a problem...Some better central planning on further reaching decisions would be helpful. Central planning affects finances; there needs to be more dialogue before a decision is made.

Central planning should put forward suggestions of what direction we can go and the cost and get feedback from faculty, staff and students. People might be willing to make a sacrifice if there needs to be a reallocation to get where we need to be.

**Human Resources (reward, recognition, career path)**

Participants emphasized that the primary purpose of information technology should be to support and enhance the work of all staff including faculty. Participants noted that this is a two-edged sword. One criterion by which information services should be judged is on their ability to enhance user productivity and effectiveness. Information technology should be seen as an opportunity to communicate, to do things better and faster. On the other hand, faculty effectiveness, both now and in the future, will be shaped by their ability and willingness to make use of information technology. Participants noted that incentives will be needed to support change and create a sense of urgency about the need for this change.

...have to look at what is the problem with the University—more than just this issue. I think a fundamental assumption that needs to be made—and that we are unwilling to make—is that faculty time is a scarce resource. If you take that position, then the structure of how faculty get served to reduce the time it takes to do the things that they want to do should be the goal of the system. For example, it is not the matter of having a structure for how to fill out a proposal. We don’t want to waste time. I need a mechanism to express my needs (e.g., I’ve seen people in the Medical School get grants out in a week). I can’t believe they do that; it takes me three months! Why isn’t there someone around to help me do this better? Or computational things—went from NeXT to run a simulation in five hours for one iteration; now the SUN station runs two iterations in five hours. Who’s going to help me get to the supercomputer? I know that is where I need to get. I would rather describe my problems and save my time. We need to think that faculty must be worth something given the amount we pay faculty. I don’t see any sense that faculty time is worth much at all.
My argument would be that I've seen...my immediate full professor "pooh-pooh" electronic mail for a while—then he finds out he was going to be head of this journal and everybody on his board said why don't you get electronic mail so we have some chance of contacting you sometime; and finally now he is signing on to his computer to pick up his mail. It seems to me, you can't legislate to someone [that] you have to do it. But there ought to be something out there that makes people aware that they are falling though the cracks if they don't have it. I just don't see anybody surviving in [this] discipline in the next 15 years without knowing this stuff and I certainly doubt if we would hire anybody like that, no matter how well he is trained. The incentives have to be to do your teaching and do it well and if you need this [information technology] to do it, then fine; but people are going to need it. We need at least to have people in the environment start to make these other people aware that they don't know what they are doing.

I look at information technology as an opportunity to communicate better, to do more things, to learn more. Some people are very adamant in saying 'I have enough to do. I am an expert in my field. I do not have any desire to gain knowledge in a whole other field as it would take away from my major work.' What there should be time to do is to provide people with information in concise, intelligent forms—okay, here are benefits to tying into the network. If it doesn't fit your needs, so much the better—go about your own business.

The University has no right telling faculty what skills to have, except in relation to our teaching and research mission.
Key Challenges

The University must systematically monitor the competition.

A few participants noted that the University has competitors. One participant noted that the faculty wants to provide students with certain experiences and if they can't find the resources here, faculty will be able to, via networks, use resources at other universities.

I look to the University of California to do searches on Current Contents, because the service is not reliable here.

I introduced a computerized market last year for accounting students. I want to make sure that they can not only participate in the market like this, but that they also can get every information source available. UPI's on Gopher or Current Contents, but I want much more than that on the system and I keep asking for it locally. And I want to see students walk out with the ability, if they have a company that they want to analyze, to be able to get all the available information that they possibly can. And I want students to have the ability to do that the first quarter that they are here. That is just good teaching and that is where our students should be. I'll find a way to do it. I don't know why it is not easier here. I'll have them access an Iowa or a University of California system. Iowa has an electronic model which has ten different stocks that professional traders trade, and the students trade with professional traders so they get that skill before leaving the classroom. In terms of market expertise, in terms of what you want them to have when leaving college... if they can't have it here, I'll get it elsewhere. I have four or five major information resources, but I think there should be fifteen or twenty.

Improve the network to provide for remote access, carry high resolution images, and support real-time collaborative research.

A few participants noted that remote access to information is needed. For example, participants discussed the need to access library information from anywhere—in the field using portable computers, from home, and from wherever graduate students have access to a computer.

One participant commented that they expect the transfer of images, video, and audio to begin to catch up to text. This person also expects real time interaction via technology to improve.

One participant noted that there is a strong need for technology to support interactive collaboration and real time collaborative writing.

Access to all the capabilities of the department remotely would be really nice....

...certainly improving speed, portability, and convenience in computing (e.g., more high performance workstations), but the main improvement I hope for is in high speed communication to be able to work as efficiently at home or while traveling as in the office; also to improve the efficiency of collaboration outside the University, especially internationally. Electronic retrieval of publications with high resolution color graphics is also a wish.
Provide up-to-date supercomputing and high-powered workstations central to research work.

Some participants noted that because of the complexity of scientific computing, it is critical and essential that they have access to supercomputing and high-powered workstations.

...much high performance computing, more workstations. The reason our center exists is that there is no University support for high performance computing...for SUNS, SIG's & IBM 6000's and others, so we have had to develop our own....

We do a lot of scientific computing, so from point-of-view of size and speed of scientific computers (that is distributed workstations and access to supercomputers...), these things are certainly critical to what we will be doing over the next five years.

Emphasize enhanced quality and timeliness of access to information.

A few participants noted that there should be a base level of information technology access that is paid for centrally, for everyone. A few participants also noted that they want minimum service disruption and enhanced quality/timeliness of access to information.

A few participants noted that they want enhanced and improved capacity to:

- exchange information such as journal articles and grant applications
- search on-line databases
- allow students to use portable PCs for most coursework
- access public data from other peer universities, and
- access interactive learning programs such as academic (e.g., language acquisition) or administrative (e.g., orientation, advising) programs.

High end computing might still be a 'direct' item, but still there should be some network that exists and is paid for and some low level computing that is paid for.

Have Gopher not lock my terminal. It offers a great utility, but can be a problem to use.

Long term, I want all information at my fingertips with local hard copy when needed. Something on my desktop that we can copy references from Current Contents from the last three years, paste in the manuscript and get out the door. Same for grants—find all references quickly at the desktop from the last six months. In the next six to twelve months, I want this for students.

I want to download literature; I don't want to go get it. I want to press F12 and send a message to bring the article over...especially with graduate students and post-docs—it acquaints them with the literature quicker. Tough to get people to go to the library.

Give us images and compact disks at the library.
Identify classes of users and design support programs which optimize the effectiveness of each class of users.

Some participants noted that there is a continuum of levels of information technology users at the University. For example, there are medium/large size distributed providers, departments with a small number of basic level users, and heavy-duty supercomputer users. Participants discussed that there is a need for support resources which can assist the diverse, unique/individualized unit needs.

One participant noted that his major concern is to keep up with technology, be informed, and be able to use the technology. A key concern is that information technology has reached such a level of complexity that it is impossible for one person to keep up to date or know how to use all the technology. Yet, participants noted that it is critical to remain up to date in order to conduct their research. A key question researchers are asking is, "How do you find out what is available for support?" Participants noted that they rely on graduate students, department support staff, and other technical support.

Using Silicon Graphics workstation I was able to take still graphs (200 of them) showing changes in the shape of a cell and make a video to show changes over time; it made the project come alive. The alternative was a series of 10 graphs. This would have been impossible without the person at MSI, the software, the workstation it runs on, and MSI. My ability to explain and present this work improved by a quantum leap. I had the idea, but had to get to the right contact to make it happen.

Provide users with vast, manageable amounts of storage and archival space for data and network bandwidth.

A few participants indicated that lectures in multimedia form and the use of graphical images, multimedia, and animation to easily communicate processes (such as a protein folding), require large amounts of storage and archival space for data and network bandwidth.

Provide new funding models.

Most participants noted that computing and other information technology is an essential part of conducting many kinds of research. They noted that University funding is not adequate to acquire what is needed and they are not allowed to write these costs into grant applications.
Some participants noted that researchers' information technology needs are complex and specialized and that this requires increased funding. For example, in order to conduct research there is a need to:

- provide specialized software that is expensive and requires workstations (for example geographic information systems)
- obtain software discounts through group purchases
- obtain funding in order to maintain legal software licensing of software for the right number of copies and to purchase software updates each year.

The reason our center exists is that there is no University support for high performance computing... for SUNS SIG's & IBM 6000's and others, so we have had to develop our own. We get no University money... yet I have more customers outside of the college than I have college customers... there needs to be more funding support for distributed high performance computing.

We are really worried about funding. We charge some user fees now and that provides about 20-30 percent of our funding but most comes from the college directly. I worry right now where to get the funding and am considering advertising in other states and institutions to support our center.

Next Steps

Participants were asked what the University should do over the next 2-4 years to assist them in effectively dealing with these challenges and opportunities. Participants stated the following:

Make decisions and implement processes with the purpose of assessing the users' needs, supporting the effectiveness of users, and providing accountability to the faculty and community.

A few participants noted that administrators need to be accountable to faculty and the community, and we need to remember that the underlying purpose of information technology is to support the effectiveness of faculty. Participants stated that they want an assessment of needs conducted before installing new systems, and then have users evaluate the support staff and/or technology in terms of meeting their needs.

One participant noted that many faculty in departments do not have full time information technology staff and that access to such support is important to faculty.

Faculty get evaluated by students and administrators. Students are evaluated by faculty. But very rarely do faculty evaluate administrators... need to make administrators responsible to faculty... what is happening now is total contradiction. It needs to be brought out that a) faculty get paid a fair amount of money and b) people spend time keeping us from doing whatever we do best.

I think there ought to be a mechanism for faculty reports for center of technology or whatever we call it and get some score at the end of the year, like a teacher's rating, and that becomes public knowledge; then rely on the fact that public humiliation or displeasure with performance will change performance. We need to go back and cater the structure to the needs of faculty and what they think they can do. Yes, there will be some bad decisions, but on the whole it seems like the right direction. There is no best system; there is no system that isn't second best. Understanding what our strength is and that we pay people for what they do, and then trying to help them do it better, is a useful device and thing.
There is not a belief that faculty time is valuable. For example, at Illinois, in one information technology center within the business school, administrators are evaluated by faculty [who] make suggestions on both teaching and research.

In many corporations, training needs are handled by a sub-division in the human resources department and they take on the responsibility of seeking out what is needed in the corporation. For example, if a new computer system is being installed in a department, often the training department will work hand-in-hand with the technical people so that when it goes on line then the users are brought up to speed with it. Often there is some assessment prior to the fact that the system is purchased and even implemented. Is this the right system? Perhaps the University can provide some guidance in that direction. There are different needs in different departments.

You can have all the computing resources that you can buy but if you can't bridge the gap between the user and the provider...

Whoever is making these decisions needs to know what people are doing and what they would like to do.

Establish a base level of information technology access and hardware standards for everyone that is paid for centrally.

Most participants noted that, more and more, information technology access is being viewed as an essential part of working at the University. In addition, participants commented that providers need to know that a certain level of computing and access needs to be available to all persons in order to plan delivery of services.

We need a policy about the basic entitled service. Administration is avoiding this decision, and they should not avoid it.

High end computing might still be a "direct item" but still there should be some network that exists and is paid for, and some low level computing that is paid for.
I think the University should decide what the basic level is that they want across the campus. They said everybody needs an electronic mail address and information will be distributed via electronic mail. That means that everybody at every department level needs to have basic capabilities. I think that decision needs to be made and if that department doesn't have it, then central needs to pay for it...in some cases the resources should be purchased with your grant money; other things should be provided in a central way. I don't know how to define those things. I don't think the institution has made a commitment to support the basic infrastructure across the entire campus—not just the people who are using the computer resources heavily. Everyone needs to be on the same level. They have to decide what the bottom line is and support this. They haven't done this and they just let everyone do their own thing. And if we decide what our bottom line is, we have to pay for it (and figure out how to pay for it). The University needs to decide on what the bottom line is....Give them the access—build it and they will come. Make it as easy as possible.

Provide strong leadership that will review and clarify organization, management, and service delivery of University information technology.

Some participants noted that there is a desire to have leadership with a vision that can make controversial decisions to get the job done. One participant noted that it is time to do something; someone has to make the hard decisions and focus on the purpose of supporting the work, productivity and effectiveness of faculty. Participants made several comments about the leadership for and organization of information technology. For example, participants stated:

- leadership is lacking in central planning efforts;
- strong governing bodies are needed to make strong decisions and do planning;

Someone needs to make a bold move...."Minnesota nice" doesn't help Minnesota.

The decision needs to be made. All this input--this has gone on for a long time. We need to make decisions. A lot of us would like guidance, as well. For the most part, I am happy with everything and I will get the job done; I can make decisions and I have a view of the future for the University in terms of computing for myself. But, I don't see how you can answer everyone's problems—that's not going to work. That seems to be the Minnesota way—let's give everybody what they want. That can't happen in a realistic setting. Some decisions have to be made.
• faculty and students should work on planning committees and the administration should be accountable for doing what the committee thinks is the right thing to do with funds, instead of the administration deciding what to do with funds and then having the faculty scurry around trying to be accountable for administrative decisions.

One participant noted that they want to see the information technology planning process completed in 6 to 9 months or so, so that people have something to guide their own information technology decisions.

**Coordinate purchase and selection of hardware and software.**

A few participants noted that there should be a more coordinated program in acquiring computing hardware and software—and not an environment of “every department and resource group for itself.” This person noted that a distributed workstation environment is the right idea, but there must be a better way to acquire hardware and software and suggested looking for similarities across departments.

One participant noted that the University needs to pay attention to industry standards when selecting software for student use.

**Provide easy access to information, easy data transfer, and easy communication across multiple platforms.**

Some participants discussed the need to easily access and share information. For example, participants discussed the need to:

• provide communication across multiple platforms;
• allow the easy exchange of files and documents across IBM, Mac and UNIX systems;
• provide user-friendly links between mainframe software and desktop environments, such as a link between CUFS information and desktop software;
• provide a single electronic mail system to make it easier to communicate between faculty; and
• establish a common graphical user interface for the University.

Who do you expect to lead this institution? Seems to me you expect the faculty to lead this institution—certainly research wise, but also in the classroom. It's not the administrators that lead the institution. We are paid to create ideas, make ideas.

Maybe we have to be sort of multilingual in this environment of distributed workstations, but I see that as a big energy barrier.

It would be nice if: everything was combined under one format; it was logical so that people could use it; if the information could be shared between colleagues. Make the overall system user friendly, so I wouldn't have to know six or seven different protocols and language bases that are written for a database or utility. It's a pain when you have to learn something new every day to find another small bit of information. Like you, I'll find it one way or another; one way or another I'm going to get it done. But if you want to make our jobs better and use our time effectively, make these things really useful.
When you ask what is information technology, I want all human knowledge at my fingertips. That is what we are moving towards. Eventually I’ll be able to flip on the computer and get anything I want and make hard copy locally. I want Current Contents, dump into my grant proposal, dump bibliographic references, get photo images from whatever resources and have it instantaneously, and have a standard format.

<table>
<thead>
<tr>
<th>Provide full functioning electronic processing for grants.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some participants noted that they want information technology to support the grant process.</td>
</tr>
<tr>
<td>In the near future it would help if faculty had electronic processing for grants via ORTTA and funding agencies to get faster feedback and be more sure that they will meet their deadline.</td>
</tr>
<tr>
<td>There is a gap in what is available and idiot proof for hardware and software. For example, electronic proposals—the lead time getting into it and using it is so daunting I threw it aside. I could imagine making user friendly grant proposal writing software. But you are not anywhere near this.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Provide staff training.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A few participants commented that there seems to be two perspectives emerging for training. The first is a “self-sufficiency model” where it is up to the individual to be able to use the resources available. The second is an &quot;empowerment model&quot; where the training agency tries to understand the user and the user’s context and customize training and support to meet the specific environmental needs of the department and the user.</td>
</tr>
<tr>
<td>CIS provides good training. But they need to bring it to departments and to St. Paul. Colleges and departments struggle with this. We need to take training to faculty and graduate students. This is just the way it is. If CIS can not be there physically, if there were training materials to distribute to departments or groups of researchers, departments could probably provide the training. People don’t take advantage of things here. If it is more difficult than walking upstairs, they don’t take advantage of it.</td>
</tr>
<tr>
<td>Participants also noted that departments need some incentive to keep people trained, such as discounts on software or services if a certain percent of the unit is trained.</td>
</tr>
<tr>
<td>I think classes are bad. I don’t want to go schlep across campus in February to take classes. Having a video or on-line training is a good idea. Put it on-line. Distributed education, not centralized education.</td>
</tr>
<tr>
<td>Some participants noted that having a lot of different kinds of hardware and software makes support difficult. They stated that there is a question about whether support people can be relied upon to maintain the support a specific individual needs in their work environment.</td>
</tr>
</tbody>
</table>
Decide on new funding models to support users information technology needs.

A few participants noted that the University needs to decide if faculty, department, college or University will provide funding to keep faculty up to date with computers, software, and networking. One suggestion was to provide a competitive grant for interdisciplinary proposals. Some participants suggested that guidelines be structured to encourage broad participation.

Another participant suggested that the University should seek out more opportunities to collaborate with industry which might provide more money, but a narrower focus for the use of information technology which might be more goal directed and more vocational.

A few participants noted that faculty may need to be encouraged to generate funds, stating that there is a mentality now that computing should be free—that a person should not have to generate funds for computing. The question is, “Where will it come from: the state, industry?”

One participant noted that if it is true that the University needs to enter the information technology era in order to be effective, we need to sell this idea to the legislature in order to get funding.

The University needs to look at this [funding] to avoid the technology rich and the technology poor.

As resources get tighter, individual faculty may see this as a great technological opportunity, but if there is no funding they will have to back out and disconnect themselves instead of taking advantage of these things. This is a real issue down the road.

The big thing is to look at computing as a University-wide function, explicitly we need to build up computing capabilities as much as supporting the library system.

We lament the fact that we don’t know everything that is going on; we lament the fact that there is no central clearinghouse for information on hardware, software, or whatever. There is something to say that we have a system in flux and we have centers competing with each other to produce products that will capture some of the University market. The problem is that the University isn’t a market and the resources don’t flow in the way they do in a market system.

I don’t think it’s realistic to expect a lot of faculty-generated outside funds beyond the occasional equipment grant/gift.

I suspect that central administration is being assaulted on every side by people demanding that resources float to them...but central administration doesn’t control the purse strings; they don’t print the money; the state legislature prints the money. It seems to me that if things are going to happen it is going to have to be sold at the state legislature. I don’t know, though, how receptive the legislature is to the notion that the University needs to enter the computer/information technology age in a serious way.
The University needs to support distance education.

Some participants noted that we need to give attention to distance education. One participant suggested looking at the new Graduate School of the Americas, an entire school with no physical structure. Another participant noted that we need to expand or complete holes in our current curriculum programs here and provide greater exposure to interdisciplinary learning by using distance education.

Provide additional hardware to improve research, classroom, and student computing environments.

Some participants discussed the need for more access to hardware resources in order to do the many things that are not being done now. There is a question about whether the University should provide enough computers for students to use or require students to own their own. No consensus was reached on this issue.

A few participants discussed the need for hardware for classroom use and for placement in computer labs. A few participants also noted that we need hardware to produce, manipulate, scan, view, and print images.

Students will never be able to afford a computer of their own.
Appendix 1

Background on Information Technology Planning Project

Senior University management created an Advisory Users Committee (AUC) in 1992, asking this committee to create a vision of computing and information technology for the University and offer some preliminary strategies for achieving that vision. The AUC vision states:

We envision an electronic environment, a common space, that invites members of the University community to make use of distributed information technology in realizing our land-grant mission. In addition we wish to involve members of the community at large in this collaboration. This environment will be tolerant of diverse computing platforms, provide access to global information resources, and will value innovation. (August 12, 1992)

The vision and strategy document received endorsement from the President’s Cabinet, the Senate Committee on Computing and Information Systems, and the University Senate. The AUC shared the vision with academic units and key University information technology personnel by placing it on Gopher and sending copies of it via campus mail.

To implement the vision, senior management chartered an Information Technology (InfoTech) Steering Committee, which recommended an approach that focuses on establishing the linkage between the University’s strategic requirements and its ability to use information technology to address the needs of academic and administrative units. Specifically, the Steering Committee recommended a five-step process for implementing the vision and initiated the InfoTech Planning Project. The table below lists the five tasks and the current working status for each task.

<table>
<thead>
<tr>
<th>Task</th>
<th>Working Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review University strategic direction</td>
<td>The InfoTech Team is communicating with the University Planning Steering Committee to ensure that customer information technology needs align with the University mission.</td>
</tr>
<tr>
<td>Assess customer needs for information technology</td>
<td>The Customer Assessment Group formed as part of the InfoTech Planning Project is conducting the customer needs assessment now. Focus groups and reports are completed.</td>
</tr>
<tr>
<td>Assess existing information technology investments</td>
<td>The Provider Assessment Group formed as part of the InfoTech Planning Project is conducting the central and distributed provider assessment now. Focus groups are completed and reports are in progress.</td>
</tr>
<tr>
<td>Develop strategic information technology architecture</td>
<td>The InfoTech Steering Committee will select people to develop the information technology architecture after the customer and provider assessment is completed.</td>
</tr>
<tr>
<td>Develop tactical implementation plans</td>
<td>The InfoTech Steering Committee will select people to develop tactical implementation plans after the customer and provider assessment is completed.</td>
</tr>
</tbody>
</table>
Appendix 2

Customer Council

The InfoTech Planning Team decided to form and work with a customer council in order to obtain input from customers of information technology. The Customer Council consists of 150 individuals nominated by their college dean or chancellor (up to a total of 4 faculty, administrative staff, technical staff, and students) or central department head/director (up to 3 members). Customer Council members were invited to participate in the project through involvement in focus groups and through Council meetings.

A smaller (19 members) subset of the Council, the Customer Council Liaison Group, was more heavily involved with the project by providing suggestions for writing final reports and providing feedback on drafts.

Customer Council members came from the following colleges/campuses and units:

<table>
<thead>
<tr>
<th>Colleges/Campuses</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carlson School of Management</td>
<td>Academic Affairs/Minority Affairs</td>
</tr>
<tr>
<td>College of Agriculture</td>
<td>Administrative Information Services</td>
</tr>
<tr>
<td>College of Architecture &amp; Landscape Architecture</td>
<td>Admissions</td>
</tr>
<tr>
<td>College of Biological Sciences</td>
<td>Alumni Relations</td>
</tr>
<tr>
<td>College of Education</td>
<td>Audits</td>
</tr>
<tr>
<td>College of Human Ecology</td>
<td>Boynton Health Services/U Counseling Services</td>
</tr>
<tr>
<td>College of Liberal Arts</td>
<td>Business Services</td>
</tr>
<tr>
<td>College of Natural Resources</td>
<td>Campus Health &amp; Safety</td>
</tr>
<tr>
<td>College of Pharmacy</td>
<td>Campus Master Planning</td>
</tr>
<tr>
<td>College of Veterinary Medicine</td>
<td>Computing &amp; Information Technologies</td>
</tr>
<tr>
<td>Continuing Education &amp; Extension</td>
<td>Development Office</td>
</tr>
<tr>
<td>General College</td>
<td>Disabilities Serv./Disabled Student Cultural Ctr.</td>
</tr>
<tr>
<td>Graduate School</td>
<td>Equal Opportunity &amp; Affirmative Action</td>
</tr>
<tr>
<td>Humphrey Institute of Public Affairs</td>
<td>Facilities Management</td>
</tr>
<tr>
<td>Institute of Technology</td>
<td>General Counsel</td>
</tr>
<tr>
<td>Law School</td>
<td>Housing &amp; Food Services</td>
</tr>
<tr>
<td>Medical School</td>
<td>Human Resources</td>
</tr>
<tr>
<td>Minnesota Extension Service</td>
<td>Management Planning &amp; Information Services</td>
</tr>
<tr>
<td>School of Dentistry</td>
<td>Media Resources</td>
</tr>
<tr>
<td>School of Nursing</td>
<td>Minnesota Supercomputer Institute</td>
</tr>
<tr>
<td>School of Public Health</td>
<td>Office of International Education</td>
</tr>
<tr>
<td>University College</td>
<td>Printing Services</td>
</tr>
<tr>
<td>University of Minnesota, Crookston</td>
<td>Recreational Sports/Student Union</td>
</tr>
<tr>
<td>University of Minnesota, Duluth</td>
<td>Registrar</td>
</tr>
<tr>
<td>University of Minnesota, Morris</td>
<td>Research &amp; Technology Transfer Administration</td>
</tr>
<tr>
<td></td>
<td>Student Financial Aid</td>
</tr>
<tr>
<td></td>
<td>Telecommunications</td>
</tr>
<tr>
<td></td>
<td>University Art Museum</td>
</tr>
<tr>
<td></td>
<td>University Hospital and Clinic</td>
</tr>
<tr>
<td></td>
<td>University Libraries</td>
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<td>University Press</td>
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<tr>
<td></td>
<td>University Relations</td>
</tr>
<tr>
<td></td>
<td>University Services</td>
</tr>
</tbody>
</table>
Appendix 3

Description of Focus Group Process and Participation

Focus Group Methodology

An outside consultant, Marsha R. Mueller & Associates, was hired to moderate the focus groups. Mueller has a master's degree from the Department of Social Science, University of Chicago. Her skills include work in program quality assurance, policy analysis, program evaluation, applied research, adult education, strategic planning, and group facilitation. Her professional background includes program management experience at The Pennsylvania State University and University of Illinois, along with research and evaluation work at the University of Minnesota.

A pilot focus group was conducted; some of the original focus group questions were changed based on this pilot. Focus group participants completed a pre-focus group survey which requested that they read the 1992 Advisory Users Committee (AUC) Vision and begin focusing thoughts on their information technology needs.

During each focus group, assistant moderators (InfoTech Planning Team members) took notes and tape recorded the session. After each focus group, assistant moderators collected the completed pre-focus group surveys, re-listened to the tapes, reviewed their notes, and created organized notes. The organized notes maintain confidentiality in informants' responses and include information from the pre-focus group surveys. The consultant provided feedback on all organized notes.

One team member then took the organized notes from a functional area (i.e., instruction, administration, student, research, or outreach) and drafted the report for that area, incorporating feedback from the consultant, InfoTech Planning Team members, and Customer Council Liaison Group members.

Focus Group Attendance

Some people attended more than one focus group. A total of 98 individuals participated in the focus group process. Focus groups were initially scheduled for the month of August, but scheduling was expanded through October 4 to accommodate faculty and students who were gone during the summer.

<table>
<thead>
<tr>
<th>Functional Area</th>
<th>Number of Groups</th>
<th>Attendance</th>
<th>Surveys Collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>6</td>
<td>49</td>
<td>36</td>
</tr>
<tr>
<td>Instruction</td>
<td>3</td>
<td>18</td>
<td>11</td>
</tr>
<tr>
<td>Outreach</td>
<td>4</td>
<td>17</td>
<td>4</td>
</tr>
<tr>
<td>Research</td>
<td>4</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>Student</td>
<td>4</td>
<td>19</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
<td><strong>119</strong></td>
<td><strong>68</strong></td>
</tr>
</tbody>
</table>
Appendix 4

Pre-Focus Group Survey and Focus Group Questions

Below is a condensed version of the pre-focus group survey and a list of the focus group questions. Marsha R. Mueller & Associates worked with the InfoTech Planning Team to develop the survey and questions.

Pre-Focus Group Survey

Part I. This part involves reacquainting yourself with the August 12, 1992 Vision and Strategy for Computing and Information Technology. Please read the document carefully.

Part II. This part focuses on your current and anticipated information technology requirements.

   Current Requirements. Think about your work and how information technology supports what you do. List the information technologies you count on now to support your work at the University. (Please be as specific as possible.)

   Future Requirements. Think about how you anticipate your work will evolve over the next 5 years and what you expect to accomplish. In what ways will your information technology requirements change over the next 5 years?

   Future Requirements (students). In what ways do you feel student requirements for information technologies will change over the next 5 years?

Part III. This part seeks your assessment of specific parts of the Vision and Strategy statement.

   For the vision statement

   • To what extent do you feel the vision statement is on target? (In other words, does the statement adequately reflect where information technology needs to be 5 years from now to support high quality, globally competitive work at the University?)
   • What changes in the statement, if any, would you recommend? (Please describe.)

   For each of the six objectives in the vision statement, participants answered the following questions

   • How important is this objective in reaching the vision of information technology at the University?
   • What changes, if any, are needed in this objective? (For example, is anything missing and/or should some parts be deleted?)
   • Are there other objectives which you feel should be added to this list? (If so, please describe.)
Pre-Focus Group Survey and Focus Group Questions
Page Two

For the Graphic Representation of The Commons
Please assess this visual by responding to the following questions:

(1) Is it clear to you what this visual is illustrating?

____NO  _____YES If yes, what does the visual represent to you? (please describe)

(2) Does this illustration adequately reflect the vision statement and objectives?

(3) In what ways should this illustration be modified or changed to communicate the vision statement and objectives? (Please describe or draw your recommended changes.)

Part IV. This part asks you to identify current information technology projects that you consider to be particularly innovative and/or interesting.

Please list any information technology projects (within or outside of the University) that you think are particularly innovative or interesting. The projects you list should be ones that you feel should be looked at for possible use at the University. In addition, briefly note the attributes of the project that make it innovative or interesting.

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>EXCITING ATTRIBUTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Name/sponsor, brief description)</td>
<td></td>
</tr>
</tbody>
</table>

Focus Group Interview Questions

Questions focusing on current work environment/information technology use

What does Information Technology mean to you?

I would like you to think about the environment, or context, in which you do your work. If you’re like most of us, there are factors in our work environment, factors more or less outside of our control, which can either enhance or limit our effectiveness. What are some of the key factors, or attributes, of your work environment that you feel significantly enhance the overall effectiveness of your work?

We’ve been discussing your current work environment. I would like to know more about how information technology fits in to the work that you do. Tell me about the information technologies you consider to be essential to your work and how you use them.

Today information technology is supported and managed in different ways at the University.

- Based on your own experience, what works? What aspects of the current way information technologies are handled do you think are effective and should be maintained?

- What about factors which limit your effectiveness? What are some of the key factors of your work environment which limit the effectiveness of your work? What aspects of the current way information technologies are handled do you think are not working and should be changed?
Pre-Focus Group Survey and Focus Group Questions
Page Three

Questions focusing on future requirements
All of you spent a substantial amount of time completing the pre-interview survey. One of the questions asked you to think about how you expect your work to evolve over the next 5 years and what you want to accomplish. One question in particular, asked how your information technology requirements will change.

• What do you see as key challenges in the next 2-4 years?
• In what ways will your information technology requirements change over the next 5 years?

Getting where you want to be 5 years from now means that progress must be made along the way. From your perspective, what must the University do in the short term, let's say within the next 2-4 years, to enhance the likelihood that you'll meet your information technology requirements 5 years from now?

Questions focusing on vision/objective statements
I want to change topics somewhat for our final questions. Up to this point we've been discussing your current and future requirements. Before coming today you had an opportunity to re-read the vision and objectives statement.

What is your reaction to the vision statement? Based on how you see your requirements now and in the near future, does the statement make sense?

What was your reaction to the objectives? Are those the smart things to be doing if the University is to fulfill its vision? Should the objectives be changed in anyway? Is anything missing?

What is your reaction to the visual (i.e., of the Commons)? If you were the designer and decision maker, what would you include in the Commons and what would you exclude?

Can you tell me about any exciting projects that you are involved with or familiar with?

Do you have any final comments you would like to make about the future of information technologies at the University?
Appendix 5

Members of Information Technology Planning Project

Information Technology Planning Project Steering Committee

Tim Fitzpatrick, Administrative Information Services
Linda Jorn, College of Agriculture/Instructional Computing
Charlene Mason, University Libraries/Automated Systems
Mike O'Connor, Finance and Operations/Operations Development
Don Riley, Academic Affairs/Computing and Information Technologies
George Wilcox, Medical School and Supercomputer Institute

Information Technology Planning Project Team

Roberta Armstrong, Student Affairs Information Systems
Jim Colten, Computer and Information Services
Jodie Berg Combs, Administrative Information Services
Larry Dunn, University Networking Services
Judith Howe, Administrative Information Services and The Graduate School
Linda Jorn, College of Agriculture/Instructional Computing
Charlene Mason, University Libraries/Automated Systems
InfoTech Planning Project
Customer Needs Assessment

Student Summary

Prepared for:
InfoTech Planning Steering Committee
InfoTech Planning Customer Council Members
InfoTech Planning Provider Council Members

Prepared by:
Customer Assessment Group
InfoTech Planning Team
University of Minnesota

January, 1994
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<thead>
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</tr>
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</tr>
<tr>
<td>Purpose of this Document</td>
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</tr>
<tr>
<td>Other Focus Group Summary Reports</td>
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<td><strong>Background</strong></td>
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</tr>
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<td>2</td>
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<td>Purpose of Customer Needs Assessment</td>
<td>2</td>
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<td>Customer Assessment Process</td>
<td>2</td>
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<tr>
<td>Focus Group Purpose</td>
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<td>Focus Group Process</td>
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<td>About the Student Focus Groups</td>
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<td><strong>Executive Summary</strong></td>
<td></td>
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<tr>
<td>How Participants Talk About &amp; Use Information Technology</td>
<td>4</td>
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<td>5</td>
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<td><strong>Findings</strong></td>
<td></td>
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<td>How Participants Talk About &amp; Use Information Technology</td>
<td>6</td>
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<tr>
<td>What's Working Now?</td>
<td>10</td>
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<td>What's Not Working?</td>
<td>12</td>
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<td>Key Challenges</td>
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<td>Next Steps</td>
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<td><strong>Appendices</strong></td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
<td>Appendix 5: Members of Information Technology Planning Project</td>
<td>27</td>
</tr>
</tbody>
</table>
Audience for and Purpose of this Document

**Audience**

This summary was prepared for the InfoTech Planning Steering Committee, Customer Council Members, Provider Council Members, and people who will be involved in the next step of the InfoTech Planning Project.

**Purpose of this Document**

This document provides a detailed summary of information that key informants about information technology at the University of Minnesota provided during student focus groups. The focus groups were conducted as part of the Information Technology Planning Project.

For readers who are not interested in the amount of detail provided in this document, a summary of major findings across all five functional focus groups (administration, instruction, outreach, research, and student) will be available early in 1994.

The following are provided in this document:

- a background section, which describes the Information Technology Planning Project,
- an executive summary, which highlights key findings, and
- a findings section, which details participants' focus group comments.

Read the findings section if you want to:

- understand and read about specific examples of how students are using information technology,
- learn what students think is working and is not working in terms of information technology,
- understand what students view as key information technology challenges and next steps the University should take in order to meet students' information technology needs,
- make informed budgetary and organizational decisions during your unit planning cycle in order to meet information technology challenges facing students, and/or
- improve current information technology services.

**Other Focus Group Summary Reports**

If you wish to acquire or read summary reports from the administrative, outreach, research, or instructional focus groups, or if you need the reports in alternative format, please contact:

Office of the Associate Vice President for Academic Affairs/
Academic Computing & Information Technologies
University of Minnesota
8 Morrill Hall—100 Church Street SE
Minneapolis, MN 55455
Telephone: (612) 626-9816.

Text of the reports also appears on the Internet Gopher. The path is:

- \Home Gopher Server
- \University of Minnesota Campus Information
- \University Planning
- \Information Technology Planning
- \Customer Assessment Reports.
Senior University management created the Advisory Users Committee (AUC) in 1992 and asked this committee to create a vision of computing and information technology for the University of Minnesota. In August, 1992, the AUC created a vision statement; senior management then chartered an Information Technology (InfoTech) Steering Committee which recommended a five-step planning process to implement the vision:

- review University strategic direction
- assess customer needs for information technology
- assess existing information technology investments
- develop strategic information technology architecture, and
- develop tactical implementation plans.

The InfoTech Steering Committee established the InfoTech Planning Team which has reviewed University strategic direction, assessed customer needs for information technology, and assessed existing information technology investments. Several documents have been created that report on customer needs for information technology and provide details on existing information technology investments. These reports are being distributed Winter Quarter 1994 and will help to guide decisions made in the next step of the Information Technology Planning Project. (See Appendix 1 for more background information on the Information Technology Planning Project.)

The customer needs assessment has two purposes: (1) validate the AUC vision with University units, and (2) assess University of Minnesota customers' needs for information technology.

This information will help guide decisions made in the next step of the Information Technology Planning Project, and will also be shared with providers of information technology at the University for their planning use.

Key Informants. Key informants of information technology were nominated by their collegiate, campus, or unit administrator (see Appendix 2 for list of units) to form the Customer Council. Customer Council members attended meetings and participated in focus groups, and will fill out a survey (described below). A smaller (19 members) subset of the Council, the Customer Council Liaison Group, was more heavily involved with the project by offering suggestions for writing final reports and providing feedback on drafts.

Customer Council Meetings and Liaison Group Meetings. Customer Council members attended three meetings where they were informed about the planning process and listened to invited speakers discuss future information technology trends. Liaison Group members attended several meetings where they provided feedback on draft reports and discussed the information technology planning process.

Focus Groups. Focus groups were conducted in order to validate the vision and assess customer needs (see below for further detail; a comprehensive description of the process and participation is also provided in Appendix 3).

Survey. Early Winter Quarter 1994, a survey of the Customer and Provider Councils will be conducted that will produce ratings to be used in developing a ranking of steps the University should take in the next 18-24 months to meet customers' needs for information technology.
Focus Group Purpose

The purposes of the focus groups were to:

- understand users' current work environment and information technology use as well as their future information technology requirements
- understand information technology users' reaction to the AUC vision, and
- obtain a list of exciting information technology projects.

Focus Group Process

There were 21 focus groups conducted from August through October, 1993. An outside consultant was hired with skills in strategic planning and focus group facilitation to moderate the focus groups (see Appendix 3 for further consultant credentials). Key informants self-selected into the following functional roles and attended corresponding focus groups: administration, instruction, outreach, research, and student.

Focus group participants completed a pre-focus group survey and answered a set of common questions during the focus groups. (See Appendix 4 for pre-focus group survey and focus group questions.) The InfoTech Planning Team members conducted a rigorous, reiterative process for synthesizing data from the focus groups. (As noted above, Appendix 3 provides more detail on this process.)

About the Student Focus Groups

Four student focus groups were conducted during August, September, and October, 1993, with a total of 19 participants. Pre-focus group surveys were completed by nine of these individuals.

Student focus group participants included graduate/professional and undergraduate students, as well as a number of individuals whose primary job is provision of support to students. Discussion among the individuals was lively, with much information sharing.

Future Reports

One other customer assessment report has been written and is being sent to Customer and Provider Council members, administrators who nominated Customer Council members, the Senate Committee on Computing and Information Systems, and the President's Cabinet. This report summarizes major findings across all five functional focus groups. Additional copies of this report will be available early in 1994.

A concurrent assessment of existing University information technology investments is being conducted and a report on these findings will be available early in 1994. Lastly, a report which combines customer and provider assessment summaries will also be available early in 1994.
Executive Summary

How Participants Talk About & Use Information Technology

Information technology is defined in many different ways depending on experience, discipline, and special needs. Students reported using technology in a variety of ways to support their educational activities and other interests.

What’s Working Now? What’s Not Working?

Participants were asked to identify information technology that was working at the University, and thus should not be changed, and to tell about information technology that should be improved. Responses were made easily; one interesting result is that often the same item was reported as working and not working (i.e., some aspects of it were positive while others were perceived as needing improvement).

Responses were classified into five areas: 1) Base Services; 2) Support Services; 3) Policy/Guidelines; 4) Organizational Structure; and 5) Human Resources.

Base Services. Students appreciated many base services:

- free computer labs
- campus backbone network
- Internet access
- microcomputer hardware/software discount program
- Shepherd Labs resource center
- E-mail services
- LUMINA and other library applications
- access to registration support information (e.g., Class Schedule) via Gopher
- Gopher and POPmail software, and
- support services.

At the same time, they could clearly identify the need for improving many of these. For example, upgrading computer lab equipment was considered important, as was better equipping classrooms to use technology. Expanding the campus network to include all buildings and increasing its capacity was noted. Some students were concerned that a culture of haves and have-nots was developing (e.g., some students can’t afford to buy computers on the discount program and liked Crookston’s model of including computers as part of the cost of attendance). Improvement in adaptive interfaces for disabled students is needed. E-mail software could be improved, as well.

Support Services. Among the items noted as working were:

- support from Engineering Services
- Help Line support (mostly from Computer & Information Services [CIS])
- CIS Newsletter
- availability of information on Gopher
- training classes (e.g., for E-mail), and
- availability of VCR training tapes for checkout.

Problem areas noted included lack of reliability for key systems such as the network or E-mail server. Long waits for telephone support and run-around from support staff was also not appreciated. Further, much support is not available during hours when students are on campus and needing it (e.g., labs are not open all night, consultants are not available during the evenings and on weekends). Training of support staff to meet special needs was also a concern (e.g., knowledge of adaptive interfaces, ability to work with non-traditional students). Training also needs improvement, and key points are orientation for undergraduate and graduate students; the latter, in particular, seems lacking.
Policy/Guidelines. Making public access computer labs on the Twin Cities campus available without charge was viewed as very positive. Some students talked about the need for a fair pricing structure for information technology that does not penalize students with special needs (e.g., it should not cost more for Braille output than it does for printed output). Most recognized that paying for information technology improvements was important but might be difficult in the current fiscal climate.

Students also saw the need to expand the hardware discount program to include UNIX-based workstations. They would also like to see an expanded software licensing program which included specialized (i.e., expensive) software such as statistical packages.

Organizational Structure. Students appreciated the University’s willingness to support information technology for students and faculty; some, with experience at other institutions, said this is often not the case. Students recognize that there are broad organizational issues in the information technology area, but do not feel they can recommend an appropriate organization. However, the need for improving the parts of the organization that deliver support services was clearly identified.

Some students also stated that faculty should be encouraged to require information technology in their courses, and clearly state expectations to their students.

Human Resources. In the student groups, none of the comments in the What’s Working? and What’s Not Working? areas fell into this category.

Key Challenges and Next Steps

Participants in these groups listed a number of challenges facing the University in the area of information technology:

- find ways to be more efficient and effective in core institutional activities (instruction, research, administration)
- develop appropriate policies, organization, and infrastructure for information technology
- support users of information technology
- keep up with rapid changes in information technology
- improve access to systems from all on- and off-campus (remote) locations
- become an institutional role model in developing an environment that works for disabled individuals (e.g., in developing job accommodations using technology), and
- deal with increasing resource demands that will come as more people are exposed to and use information technology (e.g., increased network load).

Participants offered a number of specific suggestions on steps the University should take to assist participants in effectively dealing with these challenges over the next 2-4 years:

- contact other universities to see how they have addressed information technology issues
- organize the presentation of information so as to make it more useful
- provide more financial resources internally, implement programs to help users save money, and help the community link to possible financial resources outside the University
- improve accessibility, utility, and quality of public labs
- complete the information technology infrastructure (wiring, PCs)
- look for opportunities to develop new information technology resources
- develop specific applications of interest to students
- support new teaching initiatives, and
- improve support for users of information technology.
Findings

The Findings section in this document is divided into three categories:

**How Participants Talk About & Use Information Technology**
This section describes how participants define information technology and how they use it in their work. Focus group participants provided many examples demonstrating that information technology is supporting the University’s mission.

**What is Working Now and What is Not Working**
This section contains participants' views on which aspects of information technology at the University work well and which do not work well. Participants frequently identified aspects of information technology as both working and not working. For example, some participants stated the network works quite well, while others stated the network is not truly effective because it is inaccessible from too many places.

**Key Challenges and Next Steps**
This section describes what participants discussed as key challenges for meeting their information technology requirements. Also listed are next steps that participants stated the University should implement in order to enhance the likelihood that their information technology requirements would be met.

Note: In this section of the document, the words “few,” “some,” and “most” have been used in order to help the reader understand how many people discussed an idea or made a comment during the focus group sessions. The word “few” means that the idea was discussed or comments were made in one focus group, “some” means in two focus groups, and “most” means in three or more focus groups. Material in *italics* is quoted information from the focus group sessions.

**How Participants Talk About & Use Information Technology**

Information technology is defined in many different ways depending on experience, discipline, and special needs.

Most students reported using information technology in instruction, for completing assignments, for communicating with others, for student government communication, and for accessing information.

A few students reported using specialized databases for information (e.g., in Law School) or requiring access to highly specialized computer programs (e.g., in Minnesota Supercomputer Institute [MSI] research).

If you say information technology to law students they will say WESTLAW and LEXIS, on-line research databases in law; and E-mail....Law is such a book-related endeavor that most don’t use anything more than these services.

...tools that we use to shape our information environment.

It's sort of like a new raw material that people don’t know how to work with.
For people with disabilities, information technology has very specific meaning and has become a critical tool for success:

- adaptive interfaces (e.g., voice synthesizers), and
- specialized input/output devices (e.g., scanners and Braille printers).

Information technology, through adaptive interfaces, offers disabled students access to the world of information that previously was difficult or impossible to attain (e.g., access to information on jobs and services formerly available only in print).

A few students reported that other students were vague about what information technology was and how they might use it.

**Students report using technology in many different ways to support their educational activities and other interests.**

Most students reported the use of E-mail to communicate: to talk with other students, professors, and friends; to communicate internationally; and to communicate with government (e.g., Congress). Some students reported use of the computer labs to access E-mail. In addition to E-mail, most students reported using other forms of information technology including telephone, voice mail, and fax, although for some electronic means of communication are becoming more important and convenient than more traditional modes.

I use E-mail within the University as the quickest way to communicate with friends who are familiar with E-mail. Minnesota Student Association (MSA) officers get E-mail and use E-mail instead of pushing around notes.

...this...is the first quarter that a professor gave us his E-mail address and stated it was the best way to communicate with him. It's hard for students to find time to go in for office hours, and office hours are limited, so we use E-mail.

The telephone and mail coming in through the mailbox are the things that slow me down the most; it requires a lot more effort to sort and respond to that type of information.

One of my real issues is to get more people using POPmail and Internet services because...not many of the profs are using it, so even though we have this fantastic resource available to us at the University, it's not utilized that much—yet...It's...a change process we have to be patient with.
Most students report using the network to access information. They use Gopher, LUMINA, Current Contents, FirstSearch, and MedLine to get information. They access governmental data such as legislative votes, and discipline-specific reference information (e.g., nucleic acid sequence data).

Many students also use the network (i.e., the Internet, campus backbone, Local Area Networks or LANs) to share information through participation in on-line discussion or news groups (e.g., LISTSERVs, news networks).

A few students reported ways of using the network to improve efficiency (e.g., to print MSA's Minnesota Daily ads on the Daily's printer).

Many students reported using information technology to prepare presentations and write papers, sometimes using a collaborative writing process that involves other students and professors. They use word processing, graphics, desktop publishing (e.g., PageMaker™, QuarkXPress), presentation tools (e.g., PowerPoint™), fax, and the network.

Many students reported using specialized information technology tools to support their research and learning:

- powerful workstations (e.g., SUN™, other UNIX™ workstations)
- MSI to access supercomputing facilities
- programs such as EUGENE (molecular biology simulations)
- statistical analysis programs (e.g., SPSS™, SAS™).

Disabled students are finding information technology opens education to them in new and exciting ways. A few students reported use of a personal computer/monitor, print and Braille printers, network access, telephone with voice mail, and TDD (telecommunications device for the deaf) coupled with voice synthesizer (for a deaf person to talk to a blind person on the telephone).

For class, I use news groups as information resources, especially for narrow interest groups. ...use LUMINA, for getting resources for our homework. What is good about LUMINA is that you log on and right there it tells you if the publication is checked out or not.

I transfer papers to another computer so someone can proofread, or fax it to a professor if I'm not able to make it to class.

[We found] it's easier to teach a chemist how to program one of those machines [supercomputers] than it is for them to try to describe molecular dynamics to us and then have us code the machine for them.

Information technology is the path to the mainstream...for students with disabilities.

I would die without a computer and scanner. I had no idea the freedom I would have with the use of a scanner to read material, and a computer so I can compose and edit things. It's a great freedom for me.
Many students reported using information technology in all aspects of their lives. Participants reported using a wide variety of software on a regular basis. While particular groupings of information technology tools used varied somewhat depending on the student’s discipline and personal circumstances, it was clear that students are quickly incorporating technology into all aspects of their lives (e.g., banking/investment and entertainment as well as coursework and research).

The average student does more than type papers; the more focused on their major, the more research they do. I keep my notes on disk, and my daily planner is on the computer. I use time planning software—it keeps you organized—and I have phone numbers on the computer. A lot of people have computers and basic software such as word processing and PageMaker, but do not have a link with modems or faxes.

I use phone/voice mail, fax, local LAN E-mail, U. S. Mail/other mail, database (storage, retrieval/search ability), statistics/numeric processing, word processing (composing and editing/desktop publishing), graphics/presentation programs [info from pre-focus group survey form].

A few students talked about the importance of support programs which make their use of information technology easier. Two commonly mentioned programs were the hardware/software purchase program available through CIS and the Minnesota Bookcenter, and the access to public domain software and upgrades available through Shepherd Labs.

What's Working Now? What's Not Working?

Participants were asked “What is working now and what is not working?” in terms of how they use information technology. Participants’ comments covered a wide range of ideas and experiences and stated high expectations. It was clear in all focus groups that people often could not talk about what is working without talking about what is not working. In this report, we have separated peoples’ comments on what is working and what is not working, simply for ease in reporting data. One result of this approach is that some items will be noted in more than one section.

Participants’ comments from all focus groups—administrative, instructional, outreach, research, and student—tended to fall into five general categories:

1. **Base Services**
   - Network/Access
   - Hardware
   - Applications & Information
2. **Support Services**
   - Reliability
   - Problem resolution services
   - Training
3. **Policy/Guidelines**
4. **Organizational Structure** (central and others)
5. **Human Resources**

The following two sections detail what participants in the student focus groups think is working or not working. We have organized participants’ comments under the five general categories listed above.
What’s Working Now?

Base Services: Network/Access
Students see the public access computer labs and computer labs in dorms as valuable resources. Most indicate that the campus backbone in general (e.g., etherjacks) works well, and they appreciate the Internet access it offers.

Base Services: Hardware
Among the commonly reported hardware services reported as working well were:

- the microcomputer hardware/software discount purchase program through the Minnesota Bookcenter
- instances of departmental planning and acquisition of hardware
- Distributed Computing Services in Shepherd Labs as a resource location to go to try things out, and
- the laptop checkout program for faculty.

Base Services: Applications and Information
A wide variety of specific applications and information sources were cited as working:

- E-mail services
- access to public domain software via CD-ROM
- LUMINA and other library applications (e.g., access to card catalog, journal indexes)
- access to registration support information via Gopher (e.g., class schedule, closed classes list, University Course Information Project publication)
- good locally-developed software (e.g., POPmail and Gopher), and
- rich information resources at the University which we can share with others (e.g., reports from MSI, research data, publications).

Having computer labs in dorms (even if outdated) for students who can’t afford computers is good and accessible.

...offering student discounts on software. Students need software and to access computers. Ability to offer students discount right here on campus is a big help, so we don’t have to check 80 places. Historically, the Bookcenter was cheapest on hardware, but now Computer City is cheaper.

I don’t know about the rest of the U, but in my little corner the availability of terminals...was always kept at a slightly larger number than the students and professors were using....it seems that once they were available then people started using them and demand caught up, so keeping ahead of the curve in our department was a good thing. A lot of people five years ago were saying why are we getting all these boxes? Now they are doing half of their work on them.

I applaud the University that every student has E-mail. That is fantastic! When I first heard, I was shocked that was incredible. Auspicious start.

...public domain software on CD-ROM on Ma... The latest and greatest on CD-ROM is there. The Micro Center keeps all that vital stuff for upgrades and it’s nice.

[The University Library is] a flagship of [the] whole University. They pushed LUMINA—not only have it, but know how to use it. Good outreach. They put up signs on use, step by step, and it is a simple system. No learning curve. So a lot of students use it.
Support Services: Reliability
This area was discussed very little in the student
groups, but a few mentioned receiving good
support from Engineering Services.

Support Services: Problem-resolution Services
Many students reported satisfaction with the
knowledge of Help Line staff, although wait time
to receive the help was considerable.

Some students and support staff attending these
sessions spoke very highly of the quality of CIS
staff support for disability services (e.g., special
accommodations).

Support Services: Training and Documentation
A few students in the groups reported the following
services as helpful:

- good classes (e.g., for E-mail use)
- check-out program for self-paced instruction
  (e.g., VCR tapes or audio cassettes)
- CIS newsletter, and
- availability of on-line information (e.g.,
  Gopher has computer prices and ordering).

Policy/Guidelines
Most students appreciated the recent decision to
make computer lab access free for Twin Cities
campus students.

Organizational Structure (central and other)
A few students cited the willingness of the
University to fund, develop, and make technology
available to students and staff as positive, and
noted that this is not the case at other institutions.

Human Resources
Items in this category were not mentioned under
what’s working for the student focus groups.
What's Not Working?

**Base Services: Network/Access**
Most stated that network capacity is inadequate (e.g., all buildings do not have fiber connections to the campus backbone), which restricts the growth of information technology use. Further, many departmental LANs are not connected to the campus backbone, limiting their access to resources. Some students indicated that access to campus backbone from dorms should be improved.

A few students stressed that appropriate technology interfaces are not in place for all disabled students, nor is information they need always available in alternative formats.

Some students noted that increasing numbers of laptop and portable computers will require additional facility modifications (e.g., network and electrical connections).

The need for 24-hour access to computer lab facilities which should include comprehensive capabilities (i.e., create, edit, print, and duplicate information) was reported by some students.

[Author's note. Law School provides a 24-hour computer lab facility for their students.]

**Base Services: Hardware**
Many students listed concerns about the adequacy of general lab facilities. They said we need more equipment at more locations for general student use. Problems were reported with labs being full, outdated equipment (e.g., that can't run new software), and lack of attention to ergonomics. For some students, the Crookston plan for providing computers for students is considered a good model.

Many students also expressed the need for more equipment to support instructional computing.

Some students are concerned about developing classes of haves and have-nots at the University.
**Base Services: Applications and Information**

Most students focused on issues surrounding ease of use, particularly for commonly used systems. (For example, in LUMINA, searching recent journals is difficult and expensive, it's easy to not find things that are there, one needs experienced librarian assistance too often, and undergraduates lack awareness of what is available.)

Some stated that the University's E-mail system should be simpler.

It was also noted that inconsistent interfaces across applications make systems harder to learn and use.

**Support Services: Reliability**

Many students reported that the University has to do more a thorough job of implementing enterprise-wide systems (e.g., E-mail project) in order to maximize success and use.

Most considered reliability of key systems as critical; for example, downtime for systems such as E-mail or networks is considered a major problem.

When they first turned the E-mail on to everybody, there were massive problems until they decided, whoa, we've got to get some more machines in. And it's kind of setting it up for failure because if I've coaxed them [the faculty] along, said it's going to be great, going to be fine, watch, this is going to be so nice, done all the background work to make it as seamless and smooth as possible and then we can't get through the phone lines to get on—well, at that point, I've lost them.

**Support Services: Problem-resolution Services**

Most students in these groups expressed major concern in this area. They stated that it's important to have enough staff to support the equipment (central and distributed).

Most saw connecting with the right support group (e.g., CIS, AIS, Telecomm) as a problem—even for knowledgeable people. Problems were cited with "run-around" (e.g., an individual called the E-mail Help Line and was told to call Telecomm; Telecomm gave her a disconnected number; she called Telecomm back and argued about the disconnected number, and got sent to the microcomputer lab; she eventually gave up).

Some students stated that help needs to be available when systems are available, not just during normal working hours.

Some students noted that computer lab staff need more training to support disabled students' needs.

POPmail is silly, cumbersome and not made for multiple user situations. We need a dead simple system. Eudora works well.
Support Services: Training and Documentation

The issue of training generated much lively discussion in these groups; most students stated that this is a major problem area. Among their comments were:

- training is needed so the University community to make more effective use of technology that is already here (e.g., improve advertising of training)
- need easy-to-use, quick help
- there is little or no "start-up" help, and orientation about what is available
- it takes too long to learn enough to benefit from use of information technology
- faculty need help in becoming aware of uses of technology for instruction
- videos for E-mail training are needed
- spread classes throughout the quarter more effectively
- consider needs of special groups of students (e.g., adult students who haven’t been exposed to computers, evening students, financially disadvantaged students, disabled students) and ensure support for them
- provide orientation programs for both new undergraduates and new graduate students, especially the latter, and
- better documentation in the computer labs is needed.

Policy/Guidelines

How we are going to pay for information technology improvements is recognized as a problem by most students. Most see a need for the payment system to be fair (e.g., avoid special costs for customization of interfaces required by the disabled). Some students and support staff indicated awareness of the additional costs of adaptive systems and the need for policy to govern how costs are handled.

Site licensing for software was seen by most students as good, but in need of expansion, especially for expensive software (e.g., statistical packages, database management software).

Many students felt the hardware discount program needs to offer more variety, particularly UNIX machines (e.g., SUN), since some students are going to be working in environments after graduation that require them.

One of the things that is pretty key to the success of future computing on campus is to really...be aware of all the different things that are available and then to somehow encourage faculty to modify their curriculum to really take advantage of that. That’s not only going to be in assignments given out to students; this could mean in the future multimedia CD-ROMs...giving presentations or classroom lectures instead of notes or slides; having on-line PowerPoint so that they could go through and give their lecture notes on slide presentations; I’ve used PowerPoint for that and it’s just great. The technology is already here; it is just that the U isn’t equipped for the faculty to take advantage of them, and I am not sure the faculty is that aware that this technology is available.

There is a lack of knowledge on how to use E-mail. People don’t know how to use news-group information; it is there, 600-700 groups. ...need a better outreach system for education ...need to educate students or offer promotion on what is available. Offer E-mail in the dorms.

If the University is going to be encouraging, facilitating, wants everyone to get ahold of this technology, to use it, to drive it, then there has to be a way to provide...for some kind of funding for equipment.

The U of MN must make workstations available at the Bookstore [info from pre-focus group survey form].
Organizational Structure (central and other)

Most students recognized that there are organizational issues in this area. But they stated that it is hard to know what sort of organizational structure is needed to best support information technology and implement changes.

The information environment and associated technology is seen as different from the physical environment; it's changing very fast which necessitates more extensive user training; the information environment is created by all of us (not provided centrally); it's highly distributed and has both shared and personal aspects. The need for planning was noted by many students.

A few students noted that while we have a lot of knowledge on using technology to support the disabled, the University lacks an appropriate organization for delivering these services.

Some students stated that faculty should be encouraged to require use of information technology in assignments and be clear about these expectations in class syllabus/course prerequisites.

Human Resources

Not mentioned in what's not working.

Key Challenges

Participants in these groups listed a number of challenges facing the University in the area of information technology.

Find ways to be more efficient and effective in core institutional activities (instruction, research, administration).

Easy access for the user will be important.

Provide support for different approaches to teaching that are more technology dependent (e.g., multi-media, use of computing in class assignments, submitting assignments electronically, recording process and result of work for teacher review).

Make reference material available on-line, including full text, images, etc.

Hold student government elections electronically.

Save travel time by utilizing multi-user videoconferencing and teleconferencing.

Information technology by nature is very distributed. Information is used everywhere by everyone and created by everyone all the time, so it's hard to have central administration of such a distributed thing.

It's a new challenge to try to control a campus' information environment; I don't think it's ever been addressed by the University on the scale we are looking at now.

Physical environment lends itself to having centralized support; it's pretty easy to have one organization that manages. Information environment needs decentralized support.

The Minnesota Daily says 'What has MSA done for me?' We get money from student fees and no one knows what we do. Have all student organizations set up their own Gopher server and make information available to constituents. Place agendas, minutes, resolutions, financial information there—you name it. We'll have it available to look at....

We really need references on line, such as Encyclopedia Britannica, Roget's Thesaurus.
Implement electronic forms/approval process for major functions.

Make important University information (e.g., minutes, procedures, policies, agendas, job listings, University bulletins) available on-line.

Place person-oriented files on-line for easier access (e.g., medical records).

**Develop appropriate policies, organization, and infrastructure for information technology.**

Expectations to deliver on the wide information technology vision as outlined by the AUC; and how we organize to accomplish this.

Coordination with secondary education to ensure that students arrive with a good set of information technology basic skills, similar to academic requirements now in place. Examples: keyboarding, basic word processing and spreadsheets.

**Support users of information technology.**

Stress the need for training at all levels (maybe explore connections with technical colleges).

Adult students, international students, disabled students, and nontraditional students have different needs for training and support.

**Keep up with rapid changes in information technology.**

High rate of change makes information technology planning difficult since the long term has many unknowns; 1-2 year time frame is about all we can deal with.

Multi-media is going to be big, including videoconferencing with faculty.

Ensuring that platform being worked on does not impede effective work (e.g., conversion tools, helpers).

High speed file transfer.

Relatively new equipment will be perceived as obsolete.
**Improve access to systems from all on- and off-campus (remote) locations.**

Remote access is going to be a big thing (e.g., to check E-mail, legal and library databases and catalogs from home). Cost of high speed modems is seen as a limiting factor.

New developments moving toward connectivity from home via phone system.

Connectivity in each dorm room.

Need for 24-hour access to computing facilities.

Student access to their files from any lab.

**Become an institutional role model in developing an environment that works for disabled individuals.**

Preparing students for jobs and working through accommodation issues; and developing appropriate interfaces to systems.

**Deal with increasing resource demands that will come as more people are exposed to and use information technology.**

Need hardware improvements, especially on the desktop.

Need improved network capacity and speed.

Need better help and support services (central and distributed).
Next Steps

After identifying challenges, participants offered a number of concrete suggestions on what the University should do to assist participants in effectively dealing with the challenges over the next 2-4 years.

**Contact other universities to see how they have addressed information technology issues.**

It was suggested we look at MIT’s Project Athena and Iowa State University’s Project Vincent.

**Organize the presentation of information so as to make it more useful.**

Use technology to provide information to commuter students. For example, eliminate the paper chase of finding bus schedules. If you need to know the bus times, the rack of time documents is usually empty. Provide a central station that has bus schedules (especially nice for commuters as they are on a tighter schedule). At this station, also let students type in and find out what is going on, have the ability to link into something—nice to see a campus events directory.

Find ways to make the campus community more aware of information technology resources.

**Provide more financial resources through a variety of means.**

Update old equipment, especially connected to the networks.

Provide information to the campus community on possible funding sources for information technology (e.g., grants, possible partners).

Expand the site licensing program and computer purchase programs.

**Improve accessibility, utility, and quality of public labs.**

Make at least one public access lab open 24 hours a day. Infante said yes to MSA (to make one lab open 24 hours per day), but this has not happened.

Keep the hardware and software up to date. Technology changes daily....Need to have technology available, and what is available is what student needs and should not quickly outdate. If [we are to] use computers we need something first rate—go to gold—if we want to be competitive.

Make files accessible from any computer lab. Upgrade computer labs in dorms. There is a waiting line in the dorms; 5,000 residents live in dorms and majority use them. I lived there and have seen waiting lines.

Attend to ergonomic issues.

Consider the Kinko’s Model!

**Complete the information technology infrastructure (wiring, PCs).**

Make network access universal. We are a commuter school and people not living on campus aren’t aware of information technology resources that the University supplies.

Add, standardize, and mandate Ethernet and etherjacks.
If majority of students are commuters, place information technology in the Unions or other locations where commuters spend time.

Buy more modems for the modem pool!

Provide better access for off-campus users.

Provide adaptive interfaces for disabled students, staff, and faculty.

**Look for opportunities to develop new information technology resources.**
The University should look for opportunities to assume leadership roles in developing new information technology resources for two reasons: (a) the University community needs these resources, and (b) it could provide potential sources of revenue from outside.

- Electronic publishing, especially in textbook and journal areas, is solving the problems of 'one user at a time' and physical damage that plague hardcopy now.
- Put Kinko's out of the course packet business by offering on-line alternatives at lower cost (but some cost recovery by University).
- The University has tenth best library collection (in world?, nation?); use information technology to make it the tenth best (or better) information source.

**Develop specific applications of interest to students.**
Implement student self-registration. [Author’s note. In progress.]

Get University job listings on-line. [Author’s note. Some of these, primarily for full-time positions, are available now.]

**Support new teaching initiatives.**
Proceed with "interactive distance education."

**Improve support for users of information technology.**
Start with accountability—who you go to. Then if something is not working, there is someone to go to who can fix things that need fixing right away.

Better staff training needed to improve communication with users, and for users to communicate with support staff. Bring all University staff and faculty up to a basic level of access and training to provide a base on which to build.

...in the next 6-18 months, it almost seems to me like there needs to be some kind of a moratorium and say we're going to quit looking at the fancy big stuff and we're going to bring everybody up, make sure that everybody has a working access to basic E-mail, to Gopher, to LUMINA 24 hours a day....Get it all running at a base level and then everybody will get on board, everybody will get used to it. You'll have that standardization, and you can start adding the bells and whistles in the different areas where they are needed or wanted.
Make training materials more user-friendly and computer training part of new student/employee orientation. Need clear, concise documentation, guides, troubleshooting help heavily distributed, and available in alternative formats.

Improve development and implementation of systems (e.g., ensure programming staff account for details, work more with users before implementing projects).

Ensure staff in computer labs can deal with adaptive technology issues.

Expand technical coordinator idea to include departmental training (e.g., CIS would team up with department to offer class tailored to department).

Assign a central contact to a college or unit who would check in with you to see how things are going, etc.
Appendix 1

Background on Information Technology Planning Project

Senior University management created an Advisory Users Committee (AUC) in 1992, asking this committee to create a vision of computing and information technology for the University and offer some preliminary strategies for achieving that vision. The AUC vision states:

We envision an electronic environment, a common space, that invites members of the University community to make use of distributed information technology in realizing our land-grant mission. In addition we wish to involve members of the community at large in this collaboration. This environment will be tolerant of diverse computing platforms, provide access to global information resources, and will value innovation. (August 12, 1992)

The vision and strategy document received endorsement from the President’s Cabinet, the Senate Committee on Computing and Information Systems, and the University Senate. The AUC shared the vision with academic units and key University information technology personnel by placing it on Gopher and sending copies of it via campus mail.

To implement the vision, senior management chartered an Information Technology (InfoTech) Steering Committee, which recommended an approach that focuses on establishing the linkage between the University’s strategic requirements and its ability to use information technology to address the needs of academic and administrative units. Specifically, the Steering Committee recommended a five-step process for implementing the vision and initiated the InfoTech Planning Project. The table below lists the five tasks and the current working status for each task.

<table>
<thead>
<tr>
<th>Task</th>
<th>Working Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review University strategic direction</td>
<td>The InfoTech Team is communicating with the University Planning Steering Committee to ensure that customer information technology needs align with the University mission.</td>
</tr>
<tr>
<td>Assess customer needs for information technology</td>
<td>The Customer Assessment Group formed as part of the InfoTech Planning Project is conducting the customer needs assessment now. Focus groups and reports are completed.</td>
</tr>
<tr>
<td>Assess existing information technology investments</td>
<td>The Provider Assessment Group formed as part of the InfoTech Planning Project is conducting the central and distributed provider assessment now. Focus groups are completed and reports are in progress.</td>
</tr>
<tr>
<td>Develop strategic information technology architecture</td>
<td>The InfoTech Steering Committee will select people to develop the information technology architecture after the customer and provider assessment is completed.</td>
</tr>
<tr>
<td>Develop tactical implementation plans</td>
<td>The InfoTech Steering Committee will select people to develop tactical implementation plans after the customer and provider assessment is completed.</td>
</tr>
</tbody>
</table>
Appendix 2

Customer Council

The InfoTech Planning Team decided to form and work with a customer council in order to obtain input from customers of information technology. The Customer Council consists of 150 individuals nominated by their college dean or chancellor (up to a total of 4 faculty, administrative staff, technical staff, and students) or central department head/director (up to 3 members). Customer Council members were invited to participate in the project through involvement in focus groups and through Council meetings.

A smaller (19 members) subset of the Council, the Customer Council Liaison Group, was more heavily involved with the project by providing suggestions for writing final reports and providing feedback on drafts.

Customer Council members came from the following colleges/campuses and units:

<table>
<thead>
<tr>
<th>Colleges/Campuses</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carlson School of Management</td>
<td>Academic Affairs/Minority Affairs</td>
</tr>
<tr>
<td>College of Agriculture</td>
<td>Administrative Information Services</td>
</tr>
<tr>
<td>College of Architecture &amp; Landscape ARCH</td>
<td>Admissions</td>
</tr>
<tr>
<td>College of Biological Sciences</td>
<td>Alumni Relations</td>
</tr>
<tr>
<td>College of Education</td>
<td>Audits</td>
</tr>
<tr>
<td>College of Human Ecology</td>
<td>Boynton Health Services/U Counseling Services</td>
</tr>
<tr>
<td>College of Liberal Arts</td>
<td>Business Services</td>
</tr>
<tr>
<td>College of Natural Resources</td>
<td>Campus Health &amp; Safety</td>
</tr>
<tr>
<td>College of Pharmacy</td>
<td>Campus Master Planning</td>
</tr>
<tr>
<td>College of Veterinary Medicine</td>
<td>Computing &amp; Information Technologies</td>
</tr>
<tr>
<td>Continuing Education &amp; Extension</td>
<td>Development Office</td>
</tr>
<tr>
<td>General College</td>
<td>Disabilities Serv/Disabled Student Cultural Ctr.</td>
</tr>
<tr>
<td>Graduate School</td>
<td>Equal Opportunity &amp; Affirmative Action</td>
</tr>
<tr>
<td>Humphrey Institute of Public Affairs</td>
<td>Facilities Management</td>
</tr>
<tr>
<td>Institute of Technology</td>
<td>General Counsel</td>
</tr>
<tr>
<td>Law School</td>
<td>Housing &amp; Food Services</td>
</tr>
<tr>
<td>Medical School</td>
<td>Human Resources</td>
</tr>
<tr>
<td>Minnesota Extension Service</td>
<td>Management Planning &amp; Information Services</td>
</tr>
<tr>
<td>School of Dentistry</td>
<td>Media Resources</td>
</tr>
<tr>
<td>School of Nursing</td>
<td>Minnesota Supercomputer Institute</td>
</tr>
<tr>
<td>School of Public Health</td>
<td>Office of International Education</td>
</tr>
<tr>
<td>University College</td>
<td>Printing Services</td>
</tr>
<tr>
<td>University of Minnesota, Crookston</td>
<td>Recreational Sports/Student Union</td>
</tr>
<tr>
<td>University of Minnesota, Duluth</td>
<td>Registrar</td>
</tr>
<tr>
<td>University of Minnesota, Morris</td>
<td>Research &amp; Technology Transfer Administration</td>
</tr>
<tr>
<td></td>
<td>Student Financial Aid</td>
</tr>
<tr>
<td></td>
<td>Telecommunications</td>
</tr>
<tr>
<td></td>
<td>University Art Museum</td>
</tr>
<tr>
<td></td>
<td>University Hospital and Clinic</td>
</tr>
<tr>
<td></td>
<td>University Libraries</td>
</tr>
<tr>
<td></td>
<td>University Press</td>
</tr>
<tr>
<td></td>
<td>University Relations</td>
</tr>
<tr>
<td></td>
<td>University Services</td>
</tr>
</tbody>
</table>
Appendix 3

Description of Focus Group Process and Participation

Focus Group Methodology

An outside consultant, Marsha R. Mueller & Associates, was hired to moderate the focus groups. Mueller has a master's degree from the Department of Social Science, University of Chicago. Her skills include work in program quality assurance, policy analysis, program evaluation, applied research, adult education, strategic planning, and group facilitation. Her professional background includes program management experience at The Pennsylvania State University and University of Illinois, along with research and evaluation work at the University of Minnesota.

A pilot focus group was conducted; some of the original focus group questions were changed based on this pilot. Focus group participants completed a pre-focus group survey which requested that they read the 1992 Advisory Users Committee (AUC) Vision and begin focusing thoughts on their information technology needs.

During each focus group, assistant moderators (Info Tech Planning Team members) took notes and tape recorded the session. After each focus group, assistant moderators collected the completed pre-focus group surveys, re-listened to the tapes, reviewed their notes, and created organized notes. The organized notes maintain confidentiality in informants' responses and include information from the pre-focus group surveys. The consultant provided feedback on all organized notes.

One team member then took the organized notes from a functional area (i.e., instruction, administration, student, research, or outreach) and drafted the report for that area, incorporating feedback from the consultant, InfoTech Planning Team members, and Customer Council Liaison Group members.

Focus Group Attendance

Some people attended more than one focus group. A total of 98 individuals participated in the focus group process. Focus groups were initially scheduled for the month of August, but scheduling was expanded through October 4 to accommodate faculty and students who were gone during the summer.

<table>
<thead>
<tr>
<th>Number of Focus Groups</th>
<th>Attendance</th>
<th>Surveys Collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>6</td>
<td>49</td>
</tr>
<tr>
<td>Instruction</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>Outreach</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>Research</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Student</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>119</td>
</tr>
</tbody>
</table>
Appendix 4

Pre-Focus Group Survey and Focus Group Questions

Below is a condensed version of the pre-focus group survey and a list of the focus group questions. Marsha R. Mueller & Associates worked with the InfoTech Planning Team to develop the survey and questions.

Pre-Focus Group Survey

Part I. This part involves reacquainting yourself with the August 12, 1992 Vision and Strategy for Computing and Information Technology. Please read the document carefully.

Part II. This part focuses on your current and anticipated information technology requirements.

Current Requirements. Think about your work and how information technology supports what you do. List the information technologies you count on now to support your work at the University. (Please be as specific as possible.)

Future Requirements. Think about how you anticipate your work will evolve over the next 5 years and what you expect to accomplish. In what ways will your information technology requirements change over the next 5 years?

Future Requirements (students). In what ways do you feel student requirements for information technologies will change over the next 5 years?

Part III. This part seeks your assessment of specific parts of the Vision and Strategy statement.

For the vision statement

- To what extent do you feel the vision statement is on target? (In other words, does the statement adequately reflect where information technology needs to be 5 years from now to support high quality, globally competitive work at the University?)
- What changes in the statement, if any, would you recommend? (Please describe.)

For each of the six objectives in the vision statement, participants answered the following questions

- How important is this objective in reaching the vision of information technology at the University?
- What changes, if any, are needed in this objective? (For example, is anything missing and/or should some parts be deleted?)
- Are there other objectives which you feel should be added to this list? (If so, please describe.)
Pre-Focus Group Survey and Focus Group Questions
Page Two

For the Graphic Representation of The Commons
Please assess this visual by responding to the following questions:

(1) Is it clear to you what this visual is illustrating?

___NO   ____YES⇒If yes, what does the visual represent to you? (please describe)

(2) Does this illustration adequately reflect the vision statement and objectives?

(3) In what ways should this illustration be modified or changed to communicate the vision statement and objectives? (Please describe or draw your recommended changes.)

Part IV. This part asks you to identify current information technology projects that you consider to be particularly innovative and/or interesting.

Please list any information technology projects (within or outside of the University) that you think are particularly innovative or interesting. The projects you list should be ones that you feel should be looked at for possible use at the University. In addition, briefly note the attributes of the project that make it innovative or interesting.

<table>
<thead>
<tr>
<th>PROJECT (Name/sponsor, brief description)</th>
<th>EXCITING ATTRIBUTES</th>
</tr>
</thead>
</table>

Focus Group Interview Questions

Questions focusing on current work environment/information technology use

What does Information Technology mean to you?

I would like you to think about the environment, or context, in which you do your work. If you're like most of us, there are factors in our work environment, factors more or less outside of our control, which can either enhance or limit our effectiveness. What are some of the key factors, or attributes, of your work environment that you feel significantly enhance the overall effectiveness of your work?

We've been discussing your current work environment. I would like to know more about how information technology fits in to the work that you do. Tell me about the information technologies you consider to be essential to your work and how you use them.

Today information technology is supported and managed in different ways at the University.

- Based on your own experience, what works? What aspects of the current way information technologies are handled do you think are effective and should be maintained?

- What about factors which limit your effectiveness? What are some of the key factors of your work environment which limit the effectiveness of your work? What aspects of the current way information technologies are handled do you think are not working and should be changed?
Questions focusing on future requirements

All of you spent a substantial amount of time completing the pre-interview survey. One of the questions asked you to think about how you expect your work to evolve over the next 5 years and what you want to accomplish. One question in particular, asked how your information technology requirements will change.

- What do you see as key challenges in the next 2-4 years?
- In what ways will your information technology requirements change over the next 5 years?

Getting where you want to be 5 years from now means that progress must be made along the way. From your perspective, what must the University do in the short term, let's say within the next 2-4 years, to enhance the likelihood that you'll meet your information technology requirements 5 years from now?

Questions focusing on vision/objective statements

I want to change topics somewhat for our final questions. Up to this point we've been discussing your current and future requirements. Before coming today you had an opportunity to re-read the vision and objectives statement.

What is your reaction to the vision statement? Based on how you see your requirements now and in the near future, does the statement make sense?

What was your reaction to the objectives? Are those the smart things to be doing if the University is to fulfill its vision? Should the objectives be changed in anyway? Is anything missing?

What is your reaction to the visual (i.e., of the Commons)? If you were the designer and decision maker, what would you include in the Commons and what would you exclude?

Can you tell me about any exciting projects that you are involved with or familiar with?

Do you have any final comments you would like to make about the future of information technologies at the University?
Appendix 5

Members of Information Technology Planning Project

Information Technology Planning Project Steering Committee

Tim Fitzpatrick, Administrative Information Services
Linda Jom, College of Agriculture/Instructional Computing
Charlene Mason, University Libraries/Automated Systems
Mike O'Connor, Finance and Operations/Operations Development
Don Riley, Academic Affairs/Computing and Information Technologies
George Wilcox, Medical School and Supercomputer Institute

Information Technology Planning Project Team

Roberta Armstrong, Student Affairs Information Systems
Jim Colten, Computer and Information Services
Jodie Berg Combs, Administrative Information Services
Larry Dunn, University Networking Services
Judith Howe, Administrative Information Services and The Graduate School
Linda Jom, College of Agriculture/Instructional Computing
Charlene Mason, University Libraries/Automated Systems