

4. Investment Initiatives

Four investment initiatives are proposed.

- The first investment initiative will enhance core services, listed below, so they meet the needs of instructors, students, researchers and staff over the planning period. We will be unable to adequately meet those needs within our current budget. The need for investment in these services was identified in section 3. This initiative consists of eight sub-initiatives, one for each of the following services (see section 4.1).
 - E-Communication and Collaboration (to maintain/enhance campus portal)
 - Identification, Authorization and Authentication
 - Help (for extended hours of service)
 - IT Security
 - Administrative Information Systems
 - Campus Contacts Database (U-Who)
 - Systems and associated “data warehouse” enhancements required to support University planning activities and government reporting.
 - Evolution of Alumni/Donor System (U-Friend)
 - Electronic Payments Infrastructure Support
- The second investment initiative will (1) increase support for the use of technology in instruction, (2) enhance existing, and develop new, ICT services that support research, scholarly and artistic work, and (3) improve support for student mobile computing. This initiative is presented as three sub-initiatives (see section 4.2).
- The third investment initiative will develop a campus desktop strategy (see section 4.3).

This strategy will be developed in consultation with the University community. It will consider the acquisition, funding and renewal of desktop computers as well as associated peripherals and servers; data backup; desktop security; software updates; end-user support and training. The intent of the strategy is to identify best practises, efficiencies and cost savings, and to reduce the amount of time instructors, researchers and staff spend resolving computing issues rather than teaching, research and doing service. The need for a campus desktop strategy has been highlighted in the ICT foundational document.

While the strategy will identify best practices, the University may need to invest more in desktop computing to provide the supportive environment required by instructors, researchers and staff.

- The fourth initiative will review and improve, on an ongoing basis, ITS’ service delivery processes and organizational structure so we continue to provide services in an efficient and effective manner (see section 4.4).

This will include the simplification and automation of key service delivery processes so that they provide self-service and makes it easier for instructors, students, researchers and staff to use our services.

4.1 Improve Core ICT Services in Support of Instruction, Learning, Research and Administrative Service Delivery

As outlined in section 3, the resources that ITS can assign, from the operating budget, are inadequate to meet the student, instructor, researcher and staff needs for core (foundational) ICT services. This initiative will prevent the equivalent of crumbling foundations and, in cases where preventive maintenance could not be funded in earlier years, will “repair” critical systems upon which the entire University depends. Some of the newer services were developed in response to critical campus needs using one-time funding. The older services have reached a stage where the threat of technical and functional obsolescence is very real.

While the eight sub-initiatives are outlined below, in priority order, investment will be required in all of the sub-initiatives during the planning cycle. For example, if the University sustains another severe Internet-based attack, resources will need to be reassigned from other services to address the problem; this will delay other projects and may increase project costs (e.g. the USR-net, Si! or Unifi projects, if ITS resources are reassigned to addressing security problems and are not available for project work).

Note: The budget figures, in the table below, are incremental to 2003–04 operating budget.

	2003–04	2004–05	2005–06	2006–07
Maintain and Enhance the Campus Portal		\$480,000	\$490,000	\$500,000
Enhance Identification, Authentication and Authorization Systems		\$390,000	\$160,000	\$70,000
Enhance “Contacts” Database (U-Who)		\$160,000	\$150,000	\$150,000
ICT Security – Provide a Secure and Productive ICT Environment		\$190,000	\$350,000	\$500,000
Enhance University System and Databases Used to for Planning and Reporting (Institutional Analysis, Integrated Planning Office)		\$200,000	\$260,000	\$140,000
Enhance Alumni and Donor System (U-Friend)		\$13,000	\$35,000	\$65,000
Maintain and Enhance the Campus Electronic Payment Infrastructure	\$35,000	\$40,000	\$30,000	\$35,000
Extend Hours of Support for Core ICT Services		\$270,000	\$260,000	\$260,000
Total (over 2003–04)	\$35,000	\$1,743,000	\$1,735,000	\$1,720,000

4.1.1 Enhance and Maintain the Campus Portal

Initiative

Enhance and maintain the campus portal³⁸ (PAWS) so that it:

- enables members of the University community (prospective students, students, instructors, researchers, staff, alumni, and “electronic” visitors, etc.) easy access to the information and services they require;
- enables colleges and administrative departments to easily provide electronic information and services to the University community.

Rationale/Need

Prospective students, current students, faculty, staff, alumni and “electronic” visitors to the University have often expressed difficulty finding the information and interactive (electronic) services that they need. Most students, faculty and staff expect that this information and services will be provided via a portal.

Many campus information and services providers (colleges, SESD, Library, University Advancement and others) have asked for a standard, relatively easy-to-use method (portal) to deliver content and services electronically to specific members (groups) within the University community.

In response to those needs, a campus portal (PAWS) was deployed in fall 2003. The portal was implemented using funds from a variety of sources³⁹ (see attached budget for details). However, funding for the long-term maintenance and evolution of the portal has not been secured.

In just the first two months of operations, over 8,000 different students, faculty and staff have used the portal. Usage of the portal will continue to increase rapidly over the next two years. In addition to the current information and service providers, Student Central will use the portal to provide services and information to students. Access to the new student and finance/accounting systems will primarily be available through PAWS. The Library is

³⁸ A portal is an extension of the University’s web site presence. Rather than providing links to generic information that may be of interest to specific groups within the University community, the portal is an integrated, customized and personalized source for the electronic information and services that prospective students, current students, faculty, staff, alumni and “electronic” visitors need. The information and services provided on the portal are customized based on the “role” of the user. Users of the portal can also personalize “their portal” to subscribe or unsubscribe at any time to their choice of the information that is available to them (users are authorized to subscribe to different information based on their role). The portal remembers personal preferences upon subsequent visits to the portal site. As such, the portal always presents the information and services determined to be relevant by each member of the University community thereby removing the overwhelming task of navigating through vast quantities of content and web pages.

In addition to providing tools for end-users, the portal will also provide a rich array of tools and templates that the University’s information and service providers can utilize to deliver their content and services to their target audiences.

³⁹ Funding for implementation of PAWS was obtained from the Si! project, ITS, student computing, the Campus-Wide ICT Capital Equipment budget and the ICT Systems Development budget (see “Budget” section, below, for details). SESD also contributed 0.5 FTE to the project for approximately six months.

planning to use the portal to deliver information to students about the reserved reading lists for courses.

This initiative requests long-term funding to maintain and enhance PAWS so it meets the needs of students, instructors, researchers, staff and other members of the University community.

Budget

While developed using a variety of funding sources, stable, ongoing funding (not unlike that required for new buildings) is required to maintain and enhance the campus portal so it meets the needs of students, instructors, researchers, staff, alumni and other members of the campus community.

If the needs of the campus community are not met, some colleges and administrative departments will develop their own portals. It is not clear that any college will have funds sufficient to make the product universally available, nor to continue its ongoing operation adequately.

	2003-04	2004-05	2005-06	2006-07
Costs				
Salary and Benefits (Portal Operations, 4.25 FTE)		\$265,499	\$265,499	\$265,499
Salary and Benefits (Portal Evolution, 3.75 FTE)		\$246,064	\$246,064	\$246,064
<i>Subtotal (Salary & Benefits)</i>	\$338,644	\$511,562	\$511,562	\$511,562
Staff training	\$18,882	\$20,000	\$20,000	\$20,000
Staff desktop hardware and software		\$8,000	\$8,000	\$8,000
Staff furniture		\$20,000	\$0	\$0
Network Connection(s) for Staff Offices		\$8,000	\$0	\$0
<i>Subtotal (staff related costs)</i>	\$18,882	\$56,000	\$28,000	\$28,000
External Services/Consulting	\$97,526	\$60,000		
Luminis Software	\$431,667			
Luminis Software Maintenance	\$79,023	\$82,183	\$85,471	\$88,890
Server Purchase/Upgrades	\$100,000		\$10,000	\$15,000
Server Maintenance				\$10,000
	\$4,547	\$10,000	\$20,000	\$20,000
Other Software - Purchase and Maintenance				
Project Deficit Carry Forward		\$34,759		
<i>Total Costs</i>	\$1,070,288	\$754,505	\$655,033	\$673,452
Funding				
ITS/Project Manager	\$49,055	\$36,375		
ITS/(Student Computing	\$120,000	\$60,000		
ITS (Contingency)	\$60,000			
ITS (Server maintenance & upgrades)		\$6,400	\$6,400	\$16,400
SESD/Content Lead	\$40,026			
Systems Development Fund	\$70,000	\$70,000	\$70,000	\$70,000
Campus-Wide IT Services Infrastructure	\$100,000			
Capital Equipment				
Si! Project/Si! Operations	\$596,448	\$142,183	\$85,471	\$88,890
<i>Total Available Funding</i>	\$1,035,529	\$278,583	\$161,871	\$175,290
Surplus / (Gap)	(\$34,759)	(\$475,922)	(\$493,162)	(\$498,162)
Requested Funding (over 2003-04)		\$480,000	\$490,000	\$500,000

Benefits

A University of Saskatchewan portal would benefit all members of our community.

- Prospective students, current students, faculty, staff, alumni and “electronic” visitors to the University will have a consistent, easy to use, integrated interface to our services and information.
- Information and service providers will have a standard and rich array of tools and templates for delivering their information and services to target audiences within the University community.
- The University’s cost for providing information and services is reduced through the use of standard tools and by avoiding the duplicated effort of units developing and supporting their own portals.

- The learning time for users is reduced through the use of common web-based tools and interfaces. The productivity and the quality of their experience with the University of Saskatchewan is enhanced.

In summary, PAWS provides an effective mechanism for the University and its departments to provide compelling, web-based information and services to its community. Costs are minimized through the use of standard tools and by avoiding the counter-effectiveness of multiple campus portals. A portal, rich with information and services that meets the expectations of members of the University community, will strengthen and enhance the image of the University and put us on a level playing field with competing institutions.⁴⁰ The University of Saskatchewan must effectively use new technologies to provide the electronic services that are expected from us if we are to successfully compete for the quality faculty, staff and students we hope to attract and retain.

Partnerships

The PAWS portal team is working with the College of Arts and Science to incorporate the functionality of my.usask⁴¹ into PAWS. This will improve the value of the campus portal and reduce College costs. Rather than duplicating the effort (cost) to develop a parallel portal, the College (like other information and service providers) can focus their resources on developing ICT services specific to the needs of their students and faculty.

4.1.2 Identification, Authentication and Authorization

Initiative

Enhance the University's authentication and authorization systems so they continue to allow Colleges, ITS and other units to deploy new online services quickly, securely and cost-effectively to the growing (extended) University community.

Rationale/Need

ITS, colleges and departments now offer hundreds of different ICT services to 60,000 members of the University community. The provision of each ICT service requires a mechanism (software) for identifying, authenticating and authorizing users' access to ICT resources. It is cost-effective that campus authentication and authorization services be automated and performed centrally rather than duplicated in every college and administrative unit.

- Identification is needed to assign a unique username to each member of the University community. At the University of Saskatchewan, the NSID (Network Services Identifier) is commonly used to identify members of the community for purpose of providing ICT services. The use of a single unique identifier, such as the NSID, along with a password, provides instructors, students, researchers and staff a single login name to access all the ICT services for which they are authorized. Note: In order to

⁴⁰ Most universities in Canada and the United States have either implemented a web portal (e.g Simon Fraser, University of British Columbia, University of Manitoba, Memorial, and others) or are planning to implement a portal in the near future.

⁴¹ My.Usask is a portal developed by the College of Arts and Sciences to begin addressing the needs of their students and faculty in the absence of a campus portal.

mitigate the security risks associated with malicious⁴² access to certain services, the University may choose to implement “fewer sign-ons” rather than a single sign-on for all services.

- The authentication system verifies that the person trying to access a particular service is who she or he claims to be.
- The “authorization” system determines the set of ICT services for which each member of the University community is eligible. Authorization to services is often granted based upon a person’s role or affiliation with the University: faculty, sessional, instructor, faculty in a particular college, student taking a particular program, visiting researcher etc.; the group membership (role) information is obtained from institutional databases (e.g. student database). Authorization can also be based upon membership in an *ad hoc* group (e.g. a workgroup); someone is responsible for maintaining the list of people (NSIDs) that are members of this group.

The authorization system must ensure that individuals are only afforded access to the services and data for which they are eligible.

Description

About three years ago, ITS developed a system for identifying a person’s affiliation with the University (using source HR, student or alumni data) and managing authentication and authorization; this system is known as the Service and Server Account Management system (SSAM) and relies on the Contacts Database (see 4.1.3). This system is used by ITS, colleges⁴³ and academic support units⁴⁴ to manage authentication and authorization for more than 230 services to 60,000 members of the University community. That volume could not be accomplished manually without increasing administrative staff.

This system must be enhanced to meet the changing needs of the University.

- Within this planning cycle, the authentication and authorization system must be expanded to support 500 different services (from current 230) for the expanded University community (expected to grow to 90,000 in the next three years).

The University community is growing. The University must offer some ICT services to prospective students, visiting researchers, research collaborators from other universities, guest lecturers, contractors, provincial health care professionals (nurses, pharmacists, doctors, physiotherapists, etc.), non credit study students, students from the Saskatoon Theological Union, parents of students and others. Other universities have started to provide these services.

New ICT services will need to be defined and managed for the expanded community. Additionally, colleges want to offer ICT services in a more granular level, for example to “Commerce undergraduate students in the accounting program.” This increases the number of services to manage.

⁴² For example, malicious access to services can occur when one person tries to access a service impersonating another person (via their NSID).

⁴³ College users include Commerce, Medicine, Pharmacy & Nutrition, Nursing, Dentistry, Arts & Science, Computer Science, Education, Kinesiology and Engineering.

⁴⁴ Academic support units include Libraries, Financial Services, Student and Enrolment Services, Human Resources Division, University Advancement, Facilities Management, Consumer Services, the Learning Commons facilities and Information Technology Services.

- The authentication and authorization system must be enhanced so it supports automated delivery of usernames (NSIDs) and passwords to new members of the campus community.

The current process requires new members of the University community to go to the ITS help desk (or some college help desks) to obtain their NSID (to ensure the person is who s/he says s/he is). ITS sets up extra help desks across campus prior to, and during, the first week of classes. NSIDs must be delivered to about 4,000 new students annually.

The University has implemented some systems to automate the delivery of usernames. However, these systems do not work for prospective students, distant education students and others. The system must be modified to support a “self-discovery” procedure for username and password distribution. This process will let users “discover” their NSID and set their corresponding password, electronically.

- Improve security. While the authentication and authorization system is operated centrally, support staff across campus are authorized to manage their services (define the community eligible for that service) as well as to set/change their user passwords. The system security model must be improved to ensure that support staff are limited to only managing their services (as opposed to all campus ICT services).⁴⁵

Students sometimes wish to allow their parents or guardians access to some of their information; for example, T2202A forms are often used by parents rather than by the student. As well parents or agencies may be granted access to fee payment information by the student if she or he wishes. To provide this service, the security model must be improved.

- Develop integration plan for Banner Student, Finance and portal. ITS and the Banner ERP projects must decide if, and how, they will implement and integrate authentication and authorization for Banner Student, Banner Finance, Luminis portal and WebCT. The source of student information (for SSAM) must also be changed from SIS to the new Banner Student system (Si! project).
- Technology changes require that portions of the SSAM system must be upgraded.

⁴⁵ Without security improvement, support staff from one department may inadvertently or purposefully grant someone access to services managed by another department. For example, ITS staff should not be able to grant access to services managed by another department such as the payroll system, the student system or research system.

Budget

	2003-04	2004-05	2005-06	2006-07
Costs				
Staff (FTE)		7	3	2
Staff Salary & Benefits	\$0	\$453,291	\$198,761	\$115,742
Staff training, desktop equipment, network connection	\$0	\$28,000	\$9,000	\$5,250
Server Purchases		covered by existing ITS budget.		
Server Maintenance		covered by existing ITS budget.		
Total Costs	\$0	\$481,291	\$207,761	\$120,992
Available Funds				
SDF, 2003-04 Carry Forward		\$40,000		
SDF		\$50,000	\$50,000	\$50,000
Total Available Funding	\$0	\$90,000	\$50,000	\$50,000
Surplus (Gap)	\$0	(\$391,291)	(\$157,761)	(\$70,992)
Requested Funding (from 2003-04)	\$0	\$390,000	\$160,000	\$70,000

Benefits

- Reduces the number of usernames and passwords that faculty, students, researchers, staff and other members of the University community must know to access services and/or data for which they are authorized. Otherwise, each time a person is granted access to a new online service like e-mail, library information, etc., that person would also receive a new username and password.
- Reduces the implicit “denial of service” experienced by new members of the University. Without a campus-wide authentication and authorization system, new students, faculty and staff must give information to multiple people before they can use the online resources to which they should have access. Before and during this process, the person cannot perform their course work or the functions for which they were hired.
- Institutional cost avoidance (savings). A campus-wide authentication and authorization system provides a unified means of enabling and disabling access to a wide range of online services. The alternative is to manage access to each service separately, requiring more staff for each service and increased costs for colleges and other service providers. The incremental cost to provide a new service is reduced.
- Quicker deployment of new services. Colleges, ITS and other online service providers can create new services quickly and easily using the consolidated systems and processes for authorization, account management and authentication. Since these processes and systems do not need to be created for each new service, the time (and cost) of doing so (as well as the recurring cost of maintaining these systems) is avoided.

- Student, faculty, researcher and staff accounts can be quickly and easily created, activated. Account problems can be more quickly resolved.
- Data is interpreted consistently and updated almost “live” across all services that are managed by the authentication and authorization system.

The operational and management overhead of enabling and disabling access to services is reduced. When a new service is introduced, a service account is automatically created for all people authorized to use that service. When a person is no longer eligible for a service (leaves the University, changes departments), the account(s) to which that person is no longer eligible for, are closed.

- Improved security. The proposed security enhancements will ensure that services are provided only to members of the University community who are eligible for that service.
- Distributed management of services. While the authentication and authorization management system is operated centrally, the responsibility for managing services is distributed to service providers (colleges, ITS and administrative units). Service owners can implement changes quickly regarding eligibility to their services.
- Faculty, students, researchers and staff can use self-service to manage or change some aspects of the services for which they are eligible, for example, their passwords
- Increased accountability. Changes to an individual’s service eligibilities and passwords are logged⁴⁶ for audit purposes. Password information is stored in an encrypted form.

4.1.3 Enhance the University’s “Contacts” Database (U-Who)

Initiative

Enhance (upgrade) campus “contacts” database so that it meets the functional needs outlined by colleges and administrative units and so that it is implemented on a supported technology.

Rationale/Need

Colleges and administrative units need up-to-date contact information for students, instructors, researchers, staff, and alumni.

U-Who is the campus-wide “contacts” database that provides name, address, electronic identification and other contact information about the people that are members of, and organizations that do business with, the University of Saskatchewan. It is used daily by various colleges⁴⁷ administrative units⁴⁸ and systems⁴⁹ as well as the Library. Other units

⁴⁶ Note: While the system logs that a user’s password has been changed (including the NSID of the person who changed the password), all passwords are stored in an encrypted format and cannot be read by ICT support staff

⁴⁷ Including Arts and Science, Graduate Studies and Research

⁴⁸ Including Institutional Analysis, Student and Enrolment Services, University Advancement, Financial Services, Human Resources, Information Technology Services and Facilities Management,

⁴⁹ Including the Campus Print System (CPAS) and the Campus Authentication and Authorization Management System (SSAM).

such as Extension, Residences and Consumer Services have requested access to this data.

The contacts database was developed about six years ago. Funding (resources have) has not been available to enhance the database to meet the changing needs of the University or the changing technologies.

Description

This initiative will:

- Work with the Banner Student and Finance to integrate their systems with U-Who.
- Extend the functionality of U-Who so it meets the new needs of colleges and administrative units. Specific address collection issues, including improving e-mail address collection will be addressed. This will position colleges and departments to use e-mail as a reliable address, thereby reducing costs of surface mailings. In response to fund-raising needs, the organization model will be improved. A self-serve address change module will be implemented to provide an electronic single point of address change for our community of instructors, students, researchers and staff.
- Upgrade the technology used in U-Who. The contacts database is critical to the operation of many systems. In order to ensure high availability, U-Who must be “upgraded” to the current, vendor supported versions of the database (Oracle 9i) and applications development platform.

Budget

	2003-04	2004-05	2005-06	2006-07
Costs				
Staff (FTE))	3	4	4	4
Staff Salary and Benefits	\$121,677	\$196,342	\$196,342	\$196,342
Staff training, desktop hardware and software, furniture and network connections		\$19,500	\$9,000	\$9,000
External Services/Consulting				
Software Purchase		See budget assumptions in text below.		
Software Maintenance				
Server Purchases				
Server Maintenance				
Total Costs	\$121,677	\$215,842	\$205,342	\$205,342
Available Funds				
ITS	\$67,250			
System Development Fund (SDF)	\$54,250	\$60,000	\$58,000	\$58,000
Total Available Funding	\$121,500	\$60,000	\$58,000	\$58,000
Surplus / (Gap)	(\$176)	(\$155,842)	(\$147,342)	(\$147,342)

This initiative is supported by the heads of Financial Services, Human Resources, the Libraries, University Advancement, Student and Enrolment Services and Institutional Analysis.

The budget assumes:

- No software purchases are required. The proposed work will be done using existing tools and Oracle database licenses.
- The software maintenance costs for Oracle and other tools used for campus application development will be covered by ITS.
- There is capacity on ITS servers for the databases and applications.
- Since institutional servers are used, there is no incremental hardware maintenance costs associated with this initiative.

Benefits

- Better service to students and others.
Students and other members of the University community need only to enter or update their contact information in one place (the Library, Student Central, HRD, ITS, etc.); their current address information is then available to other units, with whom they interact. Students, faculty, staff, alumni and others assume that they will have to provide their contact information (or changes to that information) once to the University rather than to each of the campus units with which they have a relationship.
- Reduced operating costs for colleges and administrative units.
Colleges and administrative units do not have duplicate the staff effort required to enter and maintain up-to-date contact information for students, faculty, staff, alumni and others. U-Who allows the data entry effort to be shared among several units; therefore, unit staff do not have to duplicate data entry and have more time to work on other things. New self-service initiatives will allow students, faculty, staff and alumni to update their contact information.
In addition to staff savings resulting from not having to enter duplicate contact information, colleges and administrative units do not have to develop and maintain their own systems that store contact information.
- Higher quality (more accurate) contact information.
Colleges and units have access to the most current contact information as soon as it is entered. Without U-Who, people (e.g. students) would communicate their contact information to one unit (e.g. Library) but this information would not be available to others (e.g. SESD, colleges).
Because contact information (or changes to the contact information) is entered once, potential data entry errors are reduced.

Additionally, the central contacts database allows for a single implementation of a utility that verifies correct postal codes and addresses. Colleges and administrative unit costs are reduced. One copy of this software is licensed for the campus (rather than once for every system). Similarly, technical staffing costs to support this system do not have to be

duplicated. Bulk surface mailing costs are reduced because we can guarantee that the postal codes are correct.

In summary, U-Who provides a supportive environment for students (students change their address one for all communications with the campus) and creates campus efficiencies (cost avoidances). Before U-Who, students had to visit each of the Library, Student and Enrolment Services, their college computing facility, the ITS Help Desk and, if they were also employed at the University, the Human Resources Division or Payroll Services to change an address! Without a fully supported central contacts database, the name and address information would be maintained in multiple systems and will often be out-of-date or incorrect. Colleges and administrative units would have to duplicate the staff effort to maintain correct contact information (as well as duplicate the staff effort to maintain multiple systems that store contact information).

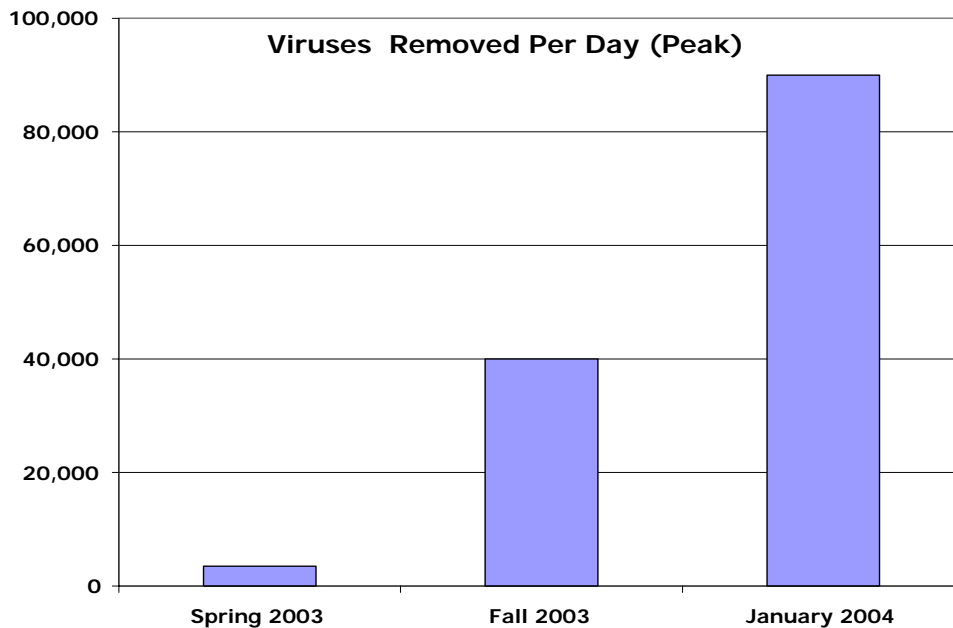
4.1.4 Secure and Productive ICT Environment

Initiative

Provide a secure and productive ICT environment for instructors, students, researchers and staff.

Institutional Need

The University's ICT resources are constantly assaulted from the Internet at an ever-increasing rate. The number of viruses sent to the University has increased 30 times over the last nine months. The graph below shows the number of e-mail messages, which contain viruses, that are detected and removed by ITS' e-mail servers daily.



We also block over 5.2 million attempts daily from the internet, to probe or attack campus ICT resources. This is a fivefold increase from November 2003.

The number of internet-based attacks against University ICT resources will continue to increase.

The effect of successful Internet-based attacks is significant and includes the following.

- **Disruption of University services and prevention of University activities.**

Increasingly, successful Internet-based attacks are preventing faculty, students and staff from teaching, learning, performing research and delivering services. Successful Internet-based attacks have disrupted college, departmental and campus ICT services for periods lasting from one hour to a week. In fall 2002, about 10,000 students were without ICT services for about two days.

Recently, a virus attack affected about 60 computers and 200 staff in one department. The department estimated that the virus attack cost them \$60,000 in time to rebuild the computer systems and in lost staff productivity. Operations were affected for almost a month.

SPAM, once a minor issue and inconvenience, now threatens to swamp the e-mail communications systems critical to the research and learning of the University. Without SPAM blocking, successful SPAM attacks result in all e-mail users being forced to sort through the often hundreds of SPAM messages daily to find the important messages for their work. This wastes significant amounts of user time, server resources to store and present these messages, and presents an opportunity for important mail to be lost, delayed, or forgotten in the flood of SPAM.

- **Modification, deletion and/or distribution of confidential University data.**

Some viruses delete (or modify) the data residing on the servers and desktop computers they infect. This data may be administrative (registration, grades, budget, etc.) or research (proposals, data and articles, etc.). The loss of this data, if not appropriately backed up, can hurt service delivery and research programs.

Other viruses e-mail the contents of an infected computer to others on and off campus. The data distributed “randomly” may include budget information, student marks, exams, draft research papers, etc.

- **Use of University computers for illegal purposes.**

Some viruses use infected University computers for illegal purposes: to distribute child pornography and copyright materials such as music, videos and software; to “attack” other computers on and off campus; and to harass and threaten others.

These activities are carried on under the “electronic letterhead” of the University. External investigating authorities routinely (at least twice a week in 2002) contact the University to complain about the systemic abuse originating from University-owned computers. Security Services and ITS investigate over 100 incidents yearly relating to harassing or threatening e-mail.

- **Increased financial liability for the University.**

Students may sue the University if the service disruptions (resulting from the attacks) are significant and prevent them from obtaining the quality of education they were expecting.

Some viruses e-mail the contents of an infected computer to others on and off campus.

The distribution of confidential information (for example, employee performance information) may be the cause for lawsuits against the University.

- **A reduction in the level of public confidence towards the University.**

Initiative Description

The University has had to make significant investments in ICT security in the last year (see section 3 for details). Even with these investments, more work must to be done to develop a secure and productive working environment for instructors, students, researchers and support staff. In this initiative, ITS will:

- Extend deployment of the existing methods for preventing Internet attacks (e.g. use of anti-virus and VPN software) to the University community (20,000+ computers).
- Implement, maintain and enhance a network firewall.
- Implement, maintain and enhance a firewall for 60+ institutional servers.
- Monitor network and servers for signs of attack and intrusion, and respond to this activity.
- Develop, implement and support methods for “automatically” providing operating system and application software security patches to Windows, Macintosh and Linux-based workstations.
- Monitor the evolution of new Internet-based attacks, develop new approaches to prevent those attacks and mitigate the effect of successful incursions.
- Provide ongoing information and training to faculty, students, researchers and staff regarding the new methods of preventing Internet-based attacks, and help them (a community of 20,000+) deploy those methods.
- Continue to enhance the University’s SPAM blocking system.
- Continue to enhance the University’s virus detection and removal system.
- Assist in the development of a campus ICT risk-management/security policy.
- Enhance and improve the security architecture and policies for the campus network.
- Assist in performing a security assessment of some campus ICT services.

This activity will reduce both the frequency and total effect of Internet-based attacks on University ICT resources, as well as provide resources to more quickly resolve the problems caused by successful attacks.

Budget

The enterprise-wide risk management survey, recently completed by PriceWaterhouseCoopers, recommends the University hire an additional 6 FTE to prevent Internet-based attacks and to mitigate the effect of successful attacks. Based upon initial planning, ITS would assign the 6 FTE as outlined below.

- Network security: 1 FTE (for network monitoring, analysis and implementation of new network security mechanisms)
- Server security: 2 FTE (for server monitoring, analysis and implementation of new server security mechanisms). Note: ITS operates over 100 servers. The additional 2

FTE would provide less than one hour of additional time, per day, to be spent on ICT security for each server.

- Faculty, student and staff desktop computer security: 3 FTE (develop new methods for preventing new Internet-based attacks, provide ongoing information and training to faculty, students, researchers and staff regarding those methods, and help them (a community of 20,000+) deploy those methods).

It is unlikely that the University will be able to implement the risk management recommendations immediately. The budget proposed for this initiative “ramps up” to the recommendations over a three-year period (starting with 2 FTE in 2004–05).

In addition to staff, hardware and software is also required to monitor and prevent Internet-based attacks.

	2003–04	2004–05	2005–06	2006–07
Staffing (FTE)		2	4	6
Staff salary and Benefits		\$121,215	\$247,270	\$373,325
Staff training, desktop, hardware and software, network connections and furniture for new staff		\$12,000	\$18,000	\$24,000
External Services/Consulting				
Hardware and Software purchase		\$50,000	\$75,000	\$90,000
Hardware and Software maintenance		\$5,000	\$7,500	\$9,000
Total Cost		\$188,215	\$347,770	\$496,325
Requested Funding (from 2003–04)		\$190,000	\$350,000	\$500,000

Benefits

Instructors, students, researchers and staff depend upon ICT services for their teaching, learning, research and administrative service delivery.

The proposed initiative would provide a more secure and productive ICT (work) environment for instructors, students, researchers and staff. It provides a supportive environment for all of the University’s strategic directions.

Not proceeding with this initiative will result in a continued increase in the number of successful Internet-based attacks upon University ICT resources. Successful attacks can disrupt network, Internet, web and e-mail services; impede the operation of desktop computers in offices, classrooms, student computing facilities and research labs; halt the delivery of online courses; shut down administrative systems such as student registration, library, payroll and fund-raising; and jeopardize CLS operations.

In summary, successful Internet-based attacks will prevent University teaching, learning, research and service delivery. University data will be modified, deleted and/or distributed at random to others on the Internet. University computers will be used for illegal purposes. Publicity of successful Internet-based attacks will damage the University’s reputation; recruitment of faculty and students will become more difficult.

Today, almost all universities and other organizations are increasing their investment in ICT security. However, no organization can remove all (100%) of its risk relating to Internet-based

attacks. Even with larger investments in ICT security, organizations such as banks, as well as the huge online presences of Microsoft and Amazon are still susceptible to Internet-based attacks. However, the 80-20 rule applies; significant benefit can be achieved for reasonable investments in ICT security.

4.1.5 Enhance University Systems and Databases Used for Planning and Reporting

Initiative

Enhance the systems and associated “data warehouses” required to support University planning activities and government reporting.

This initiative was developed in collaboration with, and with the support of, Institutional Analysis (Rob Schultz, Director) and the Integrated Planning Office (Barrie Dubray, Assistant Provost).

Rationale/Need

The Institutional Analysis office (IA) relies upon a number of systems and databases, internal and external to their office, to provide information for University planning, decision-making, funding allocation as well as government reporting (which in turn may sometimes affect funding allocations).

The current systems and databases internal to IA are inadequate to meet current needs. Providing the information required by the University is often a “manual” process. Frequently, information and reports are not delivered on time or require multiple iterations to produce correctly.

Two of the primary external sources of information used by IA—student and financial data—will change over the next two years as the University implements the new Banner Student and Finance systems.

Description

This initiative will:

- Consolidate some of the multiple processes and applications used to provide information required for Systematic Program Review, Saskatchewan Universities Funding Mechanism support, Maclean’s survey and integrated planning as well as to meet various University (e.g. the University Statistics Book) and government reporting requirements.

This will reduce the effort required to provide the required information and deliver more timely service.

- Integrate the IA’s systems and databases with the Banner Student and Finance databases as they are implemented.
- Replace the Course Inventory System that, like the current SIS v1.0, is an obsolete technology no longer supported by the vendor.
- Plan and implement ESIS reporting, as part of the University’s federal government reporting obligations. IA is responsible for this reporting.

- Enhance the capabilities of the existing systems and databases (e.g. iDat).
The first phase of iDat will go into production at the end of this fiscal year. It will bring the University closer to developing an online ten-year history of student, financial and faculty data. The information will be used for mandated University and government reporting including the University Statistics Book, integrated planning reports, and the Systematic Programme Review.
- Improve reporting by implementing a self-service capability for administrators (college and other) and researchers to access aggregated University data as well as a query tool to access University data for analysis. Access to data must be provided only to those who are authorized to use this data in their work.

Budget

	2003-04	2004-05	2005-06	2006-07
Costs				
Salary (FTE)		5	6	4
Staff Salary & Benefits		\$309,664	\$375,112	\$226,645
Staff training, desktop equipment, furniture and network connections		\$30,875	\$17,250	\$10,500
Software Purchase		See assumptions, in text below, regarding these costs.		
Software Maintenance				
Server Purchases				
Server Maintenance				
Total Costs		\$340,539	\$392,362	\$237,145
Funding				
Institutional Analysis		\$70,287	\$42,172	\$35,143
Si Project has some funds for CIS implementation (falls into data mart/ad hoc reporting category of project)		\$15,152	\$30,304	
UniFi Project re: CIS implementation - no funds set aside during project budget stage		\$0	\$0	\$0
System Development Fund		\$60,000	\$60,000	\$60,000
Available Funding		\$145,439	\$132,476	\$95,143
Surplus / (Gap)		(\$195,101)	(\$259,886)	(\$142,002)
Requested Funding (over 2003-04)		\$200,000	\$260,000	\$140,000

The budget assumes:

- No software purchases are required. The proposed work will be done using existing tools and Oracle database.
- Oracle, SAS and software tool maintenance costs will be covered by ITS for campus-wide use.
- There is capacity on ITS servers for the databases and applications.

- Since institutional servers are used, there will not be incremental hardware maintenance costs associated with this initiative.

Benefits

- Reduced effort to provide the information required for University planning and reporting.
- More timely delivery of information.
- Compliance with government reporting requirements (e.g. ESIS).
- Systems and databases that use vendor-supported technologies.

4.1.6 Enhance Alumni and Donor System (U-Friend)

Initiative

Enhance the University's Alumni and Donor system in order to provide reliable support for the University's fund-raising activities, to integrate this system with Banner Student and Finance, and to allow electronic donations.

Rationale/Need

University Advancement's (UA) mandate is to build life-long relationships with prospective students, current students, alumni and donors. UA depends upon the Alumni and Donor System (U-Friend) to track these relationships and to raise money for the University.

Some enhancements to U-Friend system and infrastructure are needed to provide reliable support for the University's fund-raising. Integration is also needed with the soon-to-be-implemented Banner Student and Finance systems (the need for integration was not anticipated until recently).

Description

This initiative will:

- Implement system enhancements, as required, to support the fund-raising campaign as described in University Advancement's four-year plan.
- Modify U-Friend so that it integrates with Banner Finance. This will require extensive modifications to the financial portions of U-Friend, including the recording and reporting of monies gathered during fund-raising campaigns.
- Modify U-Friend so that it integrates with Banner Student. U-Friend uses data from the student information system to populate its alumni database.
- Implement an interface to the University's electronic payment infrastructure.
- Upgrade the Campus Call system to support University fund-raising. This system is used for telephone solicitation, pledge reminder calling and student orientation; it can potentially also be used for student recruitment. Additional software licenses are required (US\$5,000/user).
- Develop separate development and testing environments for U-Friend and U-Who.

- Implement potential separations of U-Who and U-Friend based upon recommendations of U-Who Evolution Project.
- Review institutional needs to determine if the current system should be replaced or enhanced (scheduled for 2006–07).

Budget

	2003–04	2004–05	2005–06	2006–07
Costs				
Staff (FTE)		2	3	4
Staff Salary and Benefits	\$60,608	\$126,055	\$143,627	\$196,342
Staff desktop hardware and software, training, network connection and furniture		\$13,000	\$9,750	\$12,000
External Services/Consulting				
¹ Software Purchase			\$25,000	
¹ Software Maintenance		covered by existing ITS budget.		
Server Purchases		covered by existing ITS budget.		
Server Maintenance		covered by existing ITS budget.		
Total Costs	\$60,608	\$139,055	\$178,377	\$208,342
Available Funds				
University Advancement	\$60,608	\$126,055	\$143,627	\$143,627
Surplus / (Gap)	\$0	(\$13,000)	(\$34,750)	(\$64,715)
Requested Funding (above 2003–04)		\$13,000	\$35,000	\$65,000

Benefits

This initiative enhances a system that supports revenue generation for the University. It improves self-service capability for alumni, donors and friends. It ensures data quality by integration with Banner Student and Banner Finance. A plan for the long-term replacement or upgrade of U-Friend will be developed.

4.1.7 Maintain and Enhance Electronic Payments Infrastructure

Initiative

Ensure that a secure electronic payment and refund infrastructure is available to all University units in order to provide desired customer service.

Rationale/Need

Students consistently ask for the ability to pay fees for services and goods electronically. Colleges and departments on campus want to respond to this request. A central e-payment service allows for secure, audited ongoing operations in accepting personal information such as credit card numbers.

Some of the reasons the University's administrative units⁵⁰ expressed for developing an institutional system included:

- Better student and outside community service by creating a central University of Saskatchewan pay page that maintains contact with the credit card processor on contract.
- Less duplication of programming effort, thereby improving efficiency, reducing the potential of errors and avoiding costs.
- Sensitive credit card data is not stored on campus.
- Central logging of electronic payment and refund transactions in support of privacy legislation and audit needs.
- Centralized servers have a high level of security suitable for the needs of this type of application (e.g. units may have their servers in an office).

Description

Technical consultation will be provided to applications developers who wish use e-payments. This could include:

- Banner Student and Banner Finance.
- Alumni and Donor System (U-Friend)
- Colleges for conference registration and booking
- Bookstore
- Extension Division for attendance at non-credit courses

New security measures will be implemented as required by University business practices, the Provincial Auditor or legislation.

⁵⁰ Financial Services, University Advancement, the Extension Division, Student and Enrolment Services, the College of Kinesiology, Consumer Services, Audit Services and Information Services are involved in the development of the electronic payment infrastructure.

Budget

	2003-04	2004-05	2005-06	2006-07
Costs				
Staff (FTE)		1	1	1
Staff Salary and Benefits	\$108,587	\$39,752	\$39,752	\$39,752
Staff training, desktop hardware and software, furniture and network connection		\$3,900	\$1,800	\$1,800
Software Purchase	\$67,116			
Software Maintenance	\$9,669	\$10,636	\$11,699	\$12,869
Server Purchases	\$8,275			
Server Maintenance		\$850	\$900	\$1,100
Total Costs	\$193,647	\$55,138	\$54,152	\$55,522
Available Funds				
ITS staffing paid from contingency; staff training	\$49,201			
Implementation Fees per application; one of \$200, \$500 or \$1,000 depending on volume of transactions	\$4,700	\$4,300	\$6,300	\$2,500
Annual operating fees	\$4,050	\$2,160	\$3,240	\$3,240
Transactions fees	1000	\$1,500	\$2,100	\$2,290
System Development Fund (SDF)	\$60,000			
Si! Project Contribution	\$30,000			
ITS/Software maintenance	\$9,669	\$10,636	\$11,699	\$12,869
Total Available Funding	\$158,620	\$18,596	\$23,339	\$20,899
Surplus / (Gap)	(\$35,027)	(\$36,542)	(\$30,812)	(\$34,622)
Requested Funding (over 2003-04)	\$35,000	\$40,000	\$30,000	\$35,000

Benefits

This initiative will provide supportive and cost-effective e-payment environment that will aid in recruiting and retaining our student body. The University of Calgary was considering the elimination of fee payment by credit card to avoid the fees paid to credit card companies for this service; the student body strongly disapproved of this initiative noting that being able to pay fees via credit card and online was a benefit to students.⁵¹

Without a fully supported central electronic payment and refund system, the information would be maintained in multiple systems increasing our exposure to errors, including breaches of security or privacy.

The central electronic payment and refund system allows for a single implementation of a utility that verifies correct postal codes and addresses. This reduces software licensing costs, implementation costs (once rather than for every application wanting to accept credit cards online) and audit costs associated with ensuring correct implementation of financial applications.

⁵¹ Calgary Herald, February 2, 2004

4.1.8 Extend Hours of Support For Core ICT Services

Initiative

Extend the hours of support for key (core) ICT services to evenings and weekends, in order to meet the needs of faculty, students, researchers and prospective students.

Rationale/Need

Every hour of every day, there are instructors, students, researchers and staff who are working. Much of their work depends on core ICT services such as the campus network, Internet access, e-mail, web services, WebCT, portal, help desk, About-US (HR and payroll system⁵²), e-payment system and the student registration/information system. Prospective students from all around the world access the University's web site; they expect that our web site and online admissions system will be available 24x7. Instructors, students, researchers and staff expect that most ICT services be operational during the hours that they work (evenings and weekends).

While efforts are taken to build highly reliable services, some service outages are inevitable. Since ITS cannot provide extended hours of support with the current staffing level, service outages may last overnight or over a weekend. The effect of these outages can be extremely disruptive. Some possible outcomes could be:

- Students are unable to complete their coursework because of an ICT service failure the day prior to the due date (e.g. a network outage affects a college student computing facility or WebCT is inoperable).
- Students are unable to register for courses or make course changes prior to the deadline because the server that runs the student information system fails.
- Instructors do not complete their course preparation because they cannot log into their desktop computer or access network resources (e.g. file servers, library).
- A researcher's grant application or publication is not considered because the submission deadline was missed (because the campus access to the CA*net was down or because the file service was inoperable and the application form was unavailable for electronic submission).

The Research, Scholarly and Artistic Works Committee of Council has identified extended hours as an important service improvement in support of research. The lack of off-hours support is the most common complaint about ITS' services.

- A researcher writes (May 2003). *“This is the second weekend in a row when all e-mail through Duke has ground to a halt. As one who relies on e-mail for time-sensitive professional communication, over weekends and early AM during the week, these outages put a serious crimp in my activities. I do not expect "five nines" reliability, but I do expect that when things break, they will be fixed before Monday morning.”*
- The same researcher writes (July 2003, during a severe virus attack): *“The mail server seems choked again (see previous e-mail, below). I don't want to hector, but please let me explain why this is an issue for me today. I have two students working today and tomorrow (Sat. and Sun), in a set of experiments at a laboratory in Berkeley, CA. I am*

⁵² HRD staff regularly work evenings and weekends in order to ensure that payroll schedules are met.

trying to supervise them remotely. One step in this supervision is examining data, and then discussing the next set of experiments. The method for sharing data is e-mail. They often alert me to problems by e-mail, as this is usually the best way to get a hold of me.”

- On August 2003: *“...the duke e-mail program is stalled. On the bright side, at least I'm not getting the sobig virus ;-). I just spent 50 minutes on the phone with a colleague from McMaster, in which he read out the e-mail that he sent me this morning. He was a bit shocked that my e-mail was down, and I was a bit embarrassed. However, we had a schedule, and this exchange couldn't wait until Monday. I'm also trying to have a dialog with one of my students, and set up travel plans with a colleague in Wisconsin. He probably thinks I'm ignoring his rather urgent e-mails. I will reiterate my previous point -- we really need a way to get the e-mail running when it goes down in the "off hours".”*
- An instructor writes (December 2004): *“We are planning to use WebCT for (our) courses and I understand that ITS supports WebCT with a 24/7 commitment. I was asked by our development team to contact you to confirm that we could count on this level of support in the event that we convert (our) program to Web CT. Can you advise me on this please.”*
- An Associate Vice-President left voice mail for the ITS Director, Sunday afternoon, February 8, 2004: *“I am having trouble with my password. I phoned the help desk but there was no answer. I was wondering if you could help.”*
- A department head left voice-mail on February 9, 2004. *“... our network in part of the Health Sciences building has been down all weekend. Even today, some people who had to register with the federal government can't yet make the contact. I can't reach the help desk. Can you please look into this? We can't even print.”*

Description

This initiative will extend ITS hours of operation so that core ICT services are available evenings and weekends.

- Both in-person and on-call staff⁵³ will be available to extend support for core ICT services to evenings and weekends.

The core ICT services will include the campus network, Internet access, e-mail, web services, WebCT, portal (PAWS) and the help desk as well as the servers that run the student registration/information, About-US and e-payment systems. Note: Extended hours of support for the About-US and Si system (application) is not included in the initiative.⁵⁴

Coverage hours will be based on the main library, which is open weekdays 8:00 a.m. to 11:00 p.m. except Friday (closes at 5:00 p.m.), Saturday 10:00 a.m. to 6:00 p.m. and Sunday 11:00 a.m. to 11:00 p.m.

Coverage will be adjusted based on both need and budget. In the long term, the University may require 24x7 support for core ICT services. The increased cost for this

⁵³ This will include help desk (2 FTE), server support (1 FTE) and network staff (0.5 FTE).

⁵⁴ Extended hours of support for About-US or Si! systems will be budgeted within the support plan for that system.

coverage is high and not included in this initiative.

A system will be implemented to track trouble calls. This will provide the required coordination of support efforts among staff on varying shifts, as well as online information on current support issues and problem resolutions.

Budget

The following table outlines the funding requested so that core ICT services are available evenings and weekends, as outlined above.

	2003-04	2004 - 05	2005 - 06	2006 - 07
Costs				
Number of Staff		3.50	3.50	3.50
Staff salary and Benefits		\$224,692	\$224,692	\$224,692
Staff training, desktop hardware and software, network connection and furniture for new staff		\$22,750	\$10,500	\$10,500
External Services/Consulting				
Call tracking software implementation & support (amortized over 3 years)		\$50,000	\$50,000	\$50,000
Software Maintenance		\$5,000	\$5,000	\$5,000
Server Purchase/Upgrades		will be covered by existing ITS budget, as required.		
Server Maintenance				
Total Costs		\$302,442	\$290,192	\$290,192
Less available funding				
USR-net Operations		\$34,840	\$34,840	\$34,840
Surplus / (Gap)		(\$267,601)	(\$255,351)	(\$255,351)
Requested Funding		\$270,000	\$260,000	\$260,000

The average hours of operation for a help desk at North American doctoral/research universities is 82.5 hours per week. Thirteen per cent (13%) of these universities operate a 24x7 help desk. [Source: Educause Core Data Survey, 2002]

ITS' "main" help desk is operational 45 hours per week.⁵⁵ In the future, the University will need to extend its hours of support for core ICT services to 24x7.⁵⁶ This will increase University costs significantly.

⁵⁵ A "satellite" help desk is operational, 5:00–9:00 p.m. (Monday to Thursday) and for four hours/day on weekends. The help desk focuses on supporting distant education students and students using the Learning Commons.

⁵⁶ For example, 24x7 support for the campus network and associated services will be required when CLS operations become 24x7.

Benefits

ICT services, critical to teaching, learning, research and service delivery will be available evenings and weekends. The duration (and effect) of service outages will be reduced as staff will be available, evenings and weekends, to resolve major problems.

This will help the University to recruit and retain faculty and researchers, as well as undergraduate and graduate students. Faculty, prospective students, students and researchers expect the availability of these core services over extended hours as matter of course.

This initiative will help the University's internationalization efforts. Our web site (and portal, in the future) is usually their first contact with the University. The web server, campus network and our access to the "commercial" Internet must be available 24x7 to support access from all time zones. The student admissions, registration and e-payment systems must also be available 24x7.

We live in a world where University work (preparation for teaching, learning, research and electronic service delivery) is done every hour of every day of every week. We have users accessing our services from other time zones on a regular basis. For the University to be competitive and achieve the excellence it aims for in the quality of its education, service and research, its ICT services must eventually be available 24x7. Extended hours of ICT support provides a more supportive environment for all the University's strategic directions.

4.2 Improve Foundational ICT Services Specific to Each of Instruction, Learning and Research

ITS provides many services that support instruction, learning and research. Three sub-initiatives are proposed in this section to improve services specific to teaching, learning (student computing) and research.

The initiatives are outlined, in priority order, below. The following budgets are proposed for this planning cycle. Note: The budget figures are incremental to the 2003–04 operating budget.

	2003–04	2004–05	2005–06	2006–07
Increase Instruction Support		\$270,000	\$380,000	\$500,000
Increase ICT Services in Support of Research, Scholarly and Artistic Work		\$300,000	\$375,000	\$450,000
Support Student Mobile Computing		\$340,000	\$310,000	\$360,000
Total		\$910,000	\$1065,000,	\$1,310,000

4.2.1 Increase ICT Support for Instruction

Initiative

Improve the teaching and learning processes of the University by providing appropriate tools and support to instructors as they incorporate technology into their teaching. This will improve the quality of education, aid in attracting and retaining superior students and faculty, and minimize the effort spent by faculty in the logistics of teaching.

Rationale/Need

The Strategic Directions document outlines some of the challenges facing the University as we enter the twenty-first century. These challenges include: rapid change and the need for the University to be responsive and flexible; increased competition for faculty, students and resources; and the need to prepare our students for a global, knowledge-based economy.

Within this environment,

- Faculty want access to modern, easy-to-use technologies that support rather than hinder their goals and allow them to focus on teaching and research. They want assistance in the use of these tools and in the development of electronic resources to support their teaching strategies, as required. Finally, faculty want to retain control of how or if technology is applied in the delivery of their courses.
- For students, the learning environment must include access to all course materials⁵⁷ electronically, a rich set of communication and collaboration tools, and access to discipline-specific software, training and assistance. Online resources must be accessible from any classroom or study space on campus and from their homes. They want ICT services levels to approach 24 hours a day, 7 days a week. They would like the information presented to them to be tailored to their needs. The effective incorporation of technology in instruction is a factor in student recruitment and retention.
- The University seeks to improve the quality of education and the educational experience, to reduce student failure/drop-out rates, increase revenue and/or reduce costs. Technology investments should support one or more of these goals.

The University has made progress in incorporating technology into instructional processes. However, demand for additional services and support is increasing:

- Usage of WebCT is increasing at 50% per year. There are now 118 courses and 3,800 students (almost 25% of all students) using WebCT.
- The Province and the University are engaged in a multi-year multi-million dollar Technology Enhanced Learning initiative. The University is developing 20–25 new online courses per year.
- There is increasing demand for seats in ITS training courses regarding WebCT, Web page editing, digital imaging, PowerPoint, etc.
- The new PAWS portal provides faculty and students with another means to “deliver” course content online and provides new tools for class-related electronic interaction.
- Faculty members expect to teach in classrooms using computers, computer network, and data projectors. The institution’s capability to facilitate an instructor’s use of technology is a factor in recruitment of dynamic faculty members.

The University expects ITS to provide leadership in evaluating, providing and supporting current tools such as WebCT and its integration with student registration, electronic conferencing, whiteboard software, and video streaming services. There is increasing pressure from faculty and students for ITS to provide and support other technologies to aid in teaching and learning.

⁵⁷ Including class handouts, notes, assignments, lectures and library resources.

Description

This initiative consists of three parts:

- Help improve teaching and learning by providing instructors with additional ICT tools and the associated technical support they require to incorporate technology into their teaching processes.
- Develop, evaluate and recommend, in consultation with instructors and other units, a standard set of tools for use in teaching and learning.
- Assist the University to develop a plan stating how it will use information and communications technology to deliver courses, or portions of courses, electronically.

A. Help improve teaching and learning by helping instructors incorporate ICT into teaching.

This initiative will provide instructors with (1) additional ICT tools and (2) technical support to help them incorporate these tools into their teaching processes. It will also, in consultation with instructors and colleges, (3) evaluate and recommend ICT tools for use in teaching and learning.⁵⁸

ICT Tools

Many instructors already use a variety of ICT software tools in their teaching. These tools include e-mail, discussion forums, computer (optical mark recognition) marked exams and course web sites. This initiative will provide new software tools (including replacement for some existing tools) for faculty to use in instruction. The software tools could include:

- e-collaboration software such as videoconferencing and electronic whiteboards
- tools for developing online learning/course content
- online student feedback survey and polling software
- online quizzing software
- software to generate exams from question databanks
- software to help student (and faculty) maintain e-portfolios (electronic portfolios of their educational experience or teaching experience)
- improved integration of these tools with student enrolment, class lists, grades handling, etc.

The outcome will be a rich, evolving set of standard software available for instructors (faculty, graduate students, etc.) to use in their teaching. This software will be hosted on robust and secure servers with appropriate technical support to ensure a very high degree of performance and availability.

Technical Support

Additional technical support (online documentation, in-person help and training) will be provided to help instructors incorporate and use instructional technology in their teaching. Some examples of instructional tools, for which support will be provided, include:

- course management systems and learning management systems (e.g. WebCT)

⁵⁸ For face-to-face, mixed-mode and distributed teaching and learning.

- software tools for developing electronic learning/course content
- e-collaboration software such as videoconferencing, e-whiteboards, and application sharing
- online student feedback survey and polling software
- online quizzing software
- software to generate exams from question databanks
- tools to help instructors “capture” their lectures electronically so students can (re)view them “anytime, anywhere”⁵⁹
- software to help students (and faculty) maintain e-portfolios

Technical assistance will also be provided to help instructors incorporate online resources provided by textbook publishers into their courses

Additional technical support is required in order to reduce the time faculty will spend learning how to teach with instructional technology. College and department staff will become conversant with these tools (through training) and will be able to provide local support. Instructors will be informed about the availability of various tools and have adequate access to consultants and assistance using those tools.

The technical support will be provided through a combination of a small number of full-time staff and many students. Many universities have used students to provide technical support to faculty in the use of instructional technologies; this approach is often called the Student Technology Assistant program. We propose that graduate students be used as technology assistants. Using graduate students would have the additional benefits of giving them some exposure to teaching and experience with teaching technologies.

B. Evaluate and Recommend ICT Tools for Use in Instruction

Through this initiative, ITS will provide consultative leadership for the institution in evaluating and recommending ICT tools for teaching and learning. The outcome will be a collaborative effort to evaluate and select appropriate tools and to prioritize the effort and expenditures required to deploy those tools.

The use of a “standard” set of tools mitigates the training effect on students and faculty that might occur if they were required to use multiple tools to perform the same function. Standardization of tools could also reduce total institutional software licensing and support staff costs. It is anticipated that through this process, campus-wide “standards” would be developed in the following areas:

- Learning object repositories
- Help desk services and call tracking systems
- Course management systems
- Online quiz and exam tools
- Electronic whiteboard tools
- Desktop videoconferencing tools

⁵⁹ This includes webcasting live events and streaming archived events.

C. Assist the University develop a plan for electronic course delivery.

Governments and universities are investing more in technology to support instruction. Some of the reasons for these investments follow.

- Changing demographics and expectations of faculty and students
- To provide flexible learning opportunities
- To support different learning styles
- To increase accessibility
- To meet market demand
- To enhance student and faculty communication and discussion
- Potential cost savings
- Potential revenue generation

For example, one university determined that the student retention rate for many of its courses was 65%. It estimated that about \$14 million of instructor salaries was spent teaching the 35% of students who did not return. It is now investigating what investments, including investments in instructional technology, would increase retention rates (and reduce the amount of “wasted” teaching time).

PEW Charitable Trusts has funded a project to determine how universities can improve the quality of student learning and reduce instruction costs through the use of technology. Thirty institutions were given a grant of \$200,000 per course to redesign 30 large-enrolment courses using technology. Five different course redesign models were used. Each model varied by the amount of technology used (e.g. from where technology was supplemental to a traditional course to where the entire course was delivered using technology). Results show that:⁶⁰

- student learning improved in 20 of the 30 courses with no significant difference in the other 10;
- course delivery costs were reduced an average of 40% reduction (with a range of 7% to 77%). This amounted to \$3.6 million per year for the 30 courses;
- student completion rates were higher than for the same course prior to redesign (lower drop-failure-withdrawal rates); and
- students were more satisfied with the mode of instruction offered by the redesigned courses.

Many universities now depend heavily, or solely, upon information and communications technology to deliver courses. Some of these universities include the University of Central Florida, UMassOnline,⁶¹ the University of Phoenix⁶² as well as some Canadian universities.

⁶⁰ For more information the redesign process, see Center for Academic Transformation www.center.rpi.edu. For more information about the results, see “Improving Learning and Reducing Costs: New Models for Online Learning”, Educause Review, September - October 2003 <http://www.educause.edu/pub/er/erm03/erm035.asp>

⁶¹ UMassOnline, the University of Massachusetts's Web-based learning division, announced that online education program revenues and enrollments grew 40% and 33%, respectively, in 2003. Revenues from the combined online programs at the university exceeded \$11 million, up from \$7.8 million in 2002, while enrollments reached 13,375, up from 10,039 in 2002. More than 90% of the revenues are retained by the UMass campuses to support education and research programs.

The University of Saskatchewan must determine how it will use technology for course delivery. There are number of questions that should be asked regarding how we will use technology to best support the strategic directions and enrolment plan. Should we use technology to increase accessibility, to deliver niche programs in which we excel, for large courses, for undergraduate courses, for graduate courses, to reduce instruction costs, to increase revenue, to provide students experience with online learning and/or to improve retention rates?

This is an important strategic choice that will help shape our future. Without a plan, the University may not be taking advantage of the opportunities presented by ICT. ITS will assist in the development of this plan in collaboration with colleges and other service providers (e.g. Library, Extension, Teaching and Learning Centre, Media and Technology, Extension). The current planning done around the University's participation in the provincial TEL (technology enhanced learning) program can provide a starting point for the development of a campus plan.

Budget

The following table outlines the incremental funding proposed to improve the availability of instructional technology software tools and technical assistance to instructors in the use of this technology.

The school attributes its rapid growth to the continued addition of new online programs that serve community needs, high levels of online student satisfaction, and its recognition in the national distance learning market due to factors such as winning several national distance learning awards.

"Distance learning is critical to the future of UMass and all of higher education," UMass interim President Jack M. Wilson said. "Without it, we cannot adequately serve students who live far from our campuses or whose work and family lives make traditional higher education an unattainable goal. Also, at a time when we are expected to do more with less state funding, UMassOnline is mobilizing our five campuses to create entrepreneurial revenue-generating online programs, multi-campus collaborations, innovative faculty training, increased national visibility and significant cost savings for the university."

Source: UMassOnline press release, November 6, 2004.

http://www.umassonline.net/news/shownews.cfm?news_ID=47

⁶² The University of Phoenix is probably the best known North American "online" university. The University was founded in 1976 and states that it has granted more than 171,000 degrees. It offers both online and face-to-face instruction. It has 128 campuses (including at least one Canadian location) and offers courses worldwide via the Internet. In late December, their ads were being run on a local radio station. For more information, see [www. http://onl.uophx.edu/](http://onl.uophx.edu/)

	2003-04	2004-05	2005-06	2006-07
Costs				
Number of staff (FTE)		2.25	2.75	3.25
Staff salary and benefits		\$140,000	\$170,000	\$200,000
Number of students		10	16	25
Student salary and benefits		\$70,000	\$120,000	\$180,000
Student desktop hardware and software		\$3,000	\$5,000	\$8,000
<i>Subtotal student related costs)</i>		<i>\$73,000</i>	<i>\$125,000</i>	<i>\$188,000</i>
Software Purchases		\$50,000	\$75,000	\$100,000
Software Maintenance		\$5,000	\$7,500	\$10,000
Server Purchases		covered by existing servers or ITS existing budget		
Server Maintenance				
Total Costs		\$268,000	\$377,500	\$498,000
Requested Funding (from 2003-04)		\$270,000	\$380,000	\$500,000

Benefits

The appropriate use of electronic teaching tools can increase the effectiveness and efficiency of the teaching process and enhance the educational experience for students, thereby supporting the Strategic Directions. Specific benefits include:

- Usage of technology in instruction is a powerful factor for students in selecting an institution. Effective incorporation of technology in instruction is a factor in student retention. Students expect course materials to be available on the Web, and expect to be able to communicate with instructors via e-mail.
- Students with varying learning style preferences will benefit from alternative forms of instruction, such as can be supported using technology. This should help improve student success and satisfaction and should result in increased student retention.
- Faculty members expect to teach in classrooms using computers, computer network, and data projectors. The institution's capability to facilitate an instructor's use of technology is a factor in recruitment of dynamic faculty members
- Enrichment of content using technology and media, as well as effective use of new interactivity facilitated electronically, can improve the learning and satisfaction of students.
- Enabling undergraduate and graduate students around the world to enrol in University distributed education courses also contributes to recruitment and retention.
- The use of technology in blended learning (part face-to-face and part online) is expected to increase efficiency in teaching of large enrolment courses.
- Instructors would spend less time struggling with ICT and would have more time to spend on their teaching and research.

A collaborative approach to evaluating and selecting appropriate tools should minimize the number of similar tools that are in use and must be supported on campus. Collaboration on the tools might extend to other institutions (in the province or in consortia like COHERE). Using graduate students as student technology assistants will involve them in the teaching process and get them familiar with the tools themselves. This will be a step towards making

them better instructors, and gives them some additional experience for their e-portfolio. It has the added benefit of applying additional funds to financial support for graduate students.

Finally, a coordinated approach for the use of information and communication technology for course delivery should result in economies of scale, efficiencies in the number of software and hardware licenses required and a more effective training and support program. A coordinated plan has the added benefit of allowing the University to present a united front to outside agencies with respect to distributed learning.

Partnership

This initiative will be undertaken in collaboration with the Teaching and Learning Centre, colleges, Library, Extension and the Division of Media and Technology.

4.2.2 Increase ICT Services in Support of Research, Scholarly and Artistic Work

Initiative

Enhance existing, and develop new, ICT services and facilities that support research, scholarly and artistic work.

Rationale/Need

One of the stated strategic directions for the University is to increase campus-wide commitment to research, scholarly and artistic work. Information and communications technology is an enabler of research in virtually all disciplines. Most of ITS' services are available to all campus users—instructors, students, staff and researchers (e.g. the campus network, Internet access, access to research networks, e-mail, web services, file services, site licenses and/or educational software licenses pricing, statistical software support, desktop anti-virus software, training, etc.).

However, ITS provides very few services that are directed only towards the support of research (e.g. access to compute resources, training on the use of SSHRC and NSERC online grant application forms). Colleges provide few ICT services directly in support of research. As a result researchers are mostly on their own with respect to ICT support, hardware and software. In addition to applying the ICT technology in their discipline, many researchers struggle to find the time to keep the technology operational and secure.

A strategic and significant campus investment in ICT support and facilities for research will help build and share technical expertise, will provide resources not readily available to some researchers, and will free up faculty time to focus on, and become more successful in, their research, scholarly and artistic work. In other words, **the increased commitment to research, scholarly and artistic work (RSA) called for in the strategic directions can be supported with more ICT support for researchers.**

Description

ITS has consulted with the Research, Scholarly and Artistic Work Committee of Council, the Office of the Vice-President (Research), and the Dean (Graduate Studies and Research) regarding specific ICT services that would help improve University productivity and success

in research, scholarly and artistic work. This consultation identified three groups of services as follows:

- services that would benefit the broadest number of researchers;
- services that would benefit the research efforts in a variety of disciplines; and
- services that would support specialized, high-priority research areas.

ICT services benefiting the broadest number of researchers:

- Provide consulting regarding the ICT components of research grant proposals.
- Develop a database that would help faculty store and maintain their curriculum vitae (CV). This CV database would have the ability to convert CV information from the database to the formats required for research grant applications, web pages, and text versions for papers.
- Provide an electronic file storage, backup, retrieval and archive service for researchers with very large data needs. The current backup processes are often inadequate. A central service would offload the operational responsibility from researchers.
- Improve on-campus access to ICT for graduate students, especially graduate students outside of the sciences. It has been suggested that the University develop a computing facility that contains the hardware and software these students require.
- Provide ICT mentoring to graduate student assistants or research assistants who do not have an background in ICT, to help ensure they are following good programming or web site practices—version control, documentation, off-site backups, testing plans, etc.
- Provide systems administration and security management services for Windows and Linux-based workstations and servers. Most researchers and small research groups do not have dedicated ICT staff; this service would offload researchers from having to become ICT experts and from performing regular operational ICT activities. As an alternative, assistance in the form of training, mentoring, consulting and security monitoring can be provided to researchers and their research staff (often graduate students) in performing those duties.
- Provide a “desktop utility” for researchers including additional ICT support to unburden the researcher from chores related to selecting, installing, administering, securing and patching desktop computers. Note: this is presented as a separate initiative (see section 4.3)
- Develop a central listing (web page) of campus software licenses—including site licenses, open-source licenses, volume or educational pricing arrangements. A similar web page for vendor hardware agreements would also be created.
- Extend the hours of operations for key foundational services (network, Internet access, e-mail, web services, portal, help desk, etc.) to evenings and weekends. Faculty and researchers (as well as students and staff) expect that critical ICT services be operational during the hours that they work. Note: this is presented as a separate initiative (see section 4.1.8)

The benefits, resulting from the above services, include:

- Applies resources to deal with the technology (operation, licensing, updates) so the researchers in can focus more on the research. Helps avoid duplicating that effort across several research teams
- Prevent losses of data by ensuring proper file storage, backups, and workstation security
- Better training for graduate students in good practices related to developing and testing programs
- Incremental time savings for researchers across the campus and throughout the year.

ICT services benefiting the research efforts in a variety of disciplines:

- Establish a research data centre. The centre would contain public research data (e.g. Statistics Canada) that would be of interest to several disciplines as well as tools and technical support to help user access the data.
- Additional consulting, help and training in commonly used software for research including statistical and mathematical software, GIS (Geographic Information Systems) image and research databases.
- Desktop videoconferencing hardware, software and support to facilitate meetings among geographically separated collaborators, faculty and graduate students. Videoconferencing can facilitate virtual attendance by external thesis examiners.
- Provide a campus visualization centre (large screen, 3D, high resolution 2D, or immersive) for more effective display, presentation, and interaction with research data. Technical visualization experts would help researchers from various disciplines to use the campus facility, or would assist them to establish their own visualization centres.
- Improve network connectivity between the campus and the Saskatoon Health Region (primarily Royal University Hospital and Cancer Centre), and CommunityNet.

The benefits, resulting from the above services, include:

- Helps establish a critical mass of expertise in a technology or application, so that enough technical staff and researchers are available to assist new researchers. The dissemination of expertise, by researchers, in the technology or application would not directly detract from research in progress.
- Encourages collaboration and shared facilities.

ICT services to support specialized, high-priority research areas:

- Provide ICT support, beyond that which will be provided by the CLS, to help University of Saskatchewan researchers use the CLS.
- Provide technical ICT support to researchers for the setup of specialized equipment.
- Provide support to researchers who require high performance computing resources. Support can include:
 - provision of shared, local cluster-based high performance computing facilities and the associated support (as is available in many universities);
 - assistance and consulting regarding use of national high performance computing facilities available through the C3.ca consortium (e.g. WestGrid);
 - technical and operational support for cluster-based computing facilities established by individual research groups.

The benefits, resulting from the above services, include:

- Assists directly with establishing academic preeminence in some areas
- Assists with attracting star faculty
- Demonstrates institutional support of particular research areas or facilities and assists in winning grant competitions

Budget

The list of services identified during consultations is extensive. The cost to provide all of these services would easily exceed \$1 million annually. At best, the University has capacity to undertake only a small number of these services during the planning cycle. The following budget is proposed for this planning cycle.

	2003-04	2004-05	2005-06	2006-07
Staff salary and benefits	\$0	\$250,000	\$300,000	\$375,000
Hardware and software		\$50,000	\$75,000	\$75,000
Total Costs	\$0	\$300,000	\$375,000	\$450,000

The proposed budget will enable the provision of some services that will have an effect on research, scholarly and artistic work. The services to be provided will be approved, yearly, by the VP (Research) and AVP (ICT), in consultation with the RSA Committee, the Academic Support Committee, and researchers.

Benefits

This initiative will facilitate the development of ICT facilities and expertise that span multiple research groups and outlast any particular research project. Researchers (and their research staff, often graduate students) will be able to spend more time on their research instead of dealing with operational ICT issues. This should help improve the University's success and productivity in research, scholarly and artistic work. An improved level of ICT service can also help attract and retain faculty and graduate students. Research success may lead to increased revenue to the University through commercialization and spin-off economic benefits to the province. ICT professionals involved in these activities would participate on the national and international scale to raise the profile of the University.

An example of how investment in ICT can further RSA is the development of GIS (Geographical Information Systems) on campus. ITS was a contributing partner along with several departments in selecting and acquiring facilities and a campus-wide license for ESRI GIS software. Brian Reilkoff, an ITS employee, coordinated the effort and manages the licenses and servers involved. Brian handles the liaison with ESRI for other post-secondary institutions in the province as well as for the University. Brian has been instrumental in promoting and demonstrating GIS to other units on campus and in incorporating them into the critical mass of users.

4.2.3 Student Mobile Computing

Initiative

Leverage the student ownership of laptop and desktop computers to meet the expectations of an academically promising (and "ICT-savvy") body of students for "anywhere, anytime" access to instructional and administrative services, to assist in the recruitment of those students and to reduce the need for additional space for campus student computing facilities.

Description

The majority of students who come to the University of Saskatchewan either own their own computer or have access to one at their home. Increasingly, students are purchasing laptop computers (about 50% of student purchases at the Campus Computer Store are laptops). Students expect access to all the instructional and administrative services, currently provided by on-campus computing facilities, from laptops while they are on campus and from their home computers.

This initiative will:

- Provide 150 additional wireless network access points in classrooms, libraries and other student workspaces to facilitate student use of their laptop computers on campus.⁶³ Forty of the existing 802.11a access points will also be upgraded to support the faster wireless standard (802.11g) supported in new laptops. In addition to those provided by this initiative, we expect that colleges and departments will fund additional wireless network access points.

McGill University has installed about 240 wireless network access points for their students. UBC has recently installed about 1,200 wireless network access points in 150 buildings.

- Provide students access to the general purpose and discipline specific software and instructional resources that are currently available at campus computing facilities to students from their home computers and laptop computers while on campus.

This will require collaboration with colleges regarding software licensing and student support. An application server will probably be required to deliver software applications to student machines.

- Provide additional technical support to students. This support will include the development of automated methods to install commonly used software, operating system security upgrades and application software security upgrades on student computers. Additional training (in-person and/or online) and technical assistance will be available to they run into problems. The additional support is necessary to ensure that student workstations do not inadvertently create ICT security problems for campus computers.
- Continue to develop vendor alliances and programs to provide special hardware and software pricing for students. This activity would be provided primarily through the Campus Computer Store. Additionally, financing opportunities, such as leasing, will be explored.
- Research and evaluate new mobile technologies that support the educational process.

⁶³ There are currently about 60 wireless network access points on campus; another 20 will be installed within the next month. It is expected that about 10 wireless access points can be installed yearly from the student computing maintenance initiative. With the 150 access points proposed in this initiative, there will about 260 wireless access points on campus at the end of this planning cycle.

Budget

The following table outlines the incremental funding requested to improve the provision of “anywhere, anytime” instructional and administrative services to student home computers and laptop computers while they are on campus.

The main components of the requested funding is staffing plus the cost to install 150 additional wireless network access points⁶⁴ and the cost to upgrade the existing access points.

	2003-04	2004 - 05	2005 - 06	2006 - 07
Costs				
Staff salary and Benefits		\$154,005	\$179,298	\$229,886
<i>Subtotal (Salary & Benefits)</i>	\$0	\$154,005	\$179,298	\$229,886
Staff training	\$0	\$3,825	\$4,575	\$6,075
Staff desktop hardware and software	\$0	\$2,550	\$3,050	\$4,050
Staff furniture		\$10,125		
Staff network connection		\$4,050		
<i>Subtotal (staff related costs)</i>	\$0	\$20,550	\$7,625	\$10,125
Wireless Access Points (150 access points over 3 years)	\$0	\$150,000	\$150,000	\$150,000
Upgrade of existing wireless network access points		\$50,000		
Wireless network access cards	\$30,000			
Application Server, licenses	\$60,000		\$10,000	\$10,000
Server hw/sw maintenance	\$0	\$6,000	\$6,000	\$6,000
Application software	\$0	\$20,000	\$25,000	\$25,000
Total Costs	\$90,000	\$400,555	\$377,923	\$431,011
Available Funds				
ITS/Staff assignment	\$30,000	\$53,233	\$53,233	\$53,233
Capital Equipment Allocation for Campus Wide ICT Services	\$60,000	\$0	\$10,000	\$10,000
ITS/Hardware Maintenance		\$6,000	\$6,000	\$6,000
Total Available Funding	\$90,000	\$59,233	\$69,233	\$69,233
Surplus / (Gap)	\$0	(\$341,322)	(\$308,691)	(\$361,778)
Requested Funding		\$340,000	\$310,000	\$360,000

Benefits

Given the current, heavy demand for space on campus in general, it will be increasingly difficult to find space to expand traditional “computer laboratories” to meet the increasing student usage of computing resources.

This initiative supports student mobile computing. Wireless network access allows other existing campus spaces (for example, libraries, student study spaces, student “lounge” areas, Marquis Hall, classrooms) to be used for student computing, without repurposing those

⁶⁴ The cost to install a wireless network access point is estimated at \$3,000 per access point (including FMD work to install conduit, power, network cable and the access point, as well as the cost of the access point).

spaces. This initiative also improves access to University ICT resources from student home computers. In the short term, it should reduce the need for additional space for campus student computing facilities. In the longer term, this may result in a decrease of the amount of space required for dedicated student computing facilities. The funding needed to expand campus computing facilities can be directed to supporting mobile computing and to leverage student ownership of computers.

This initiative can also help the University attract an academically promising body of students. These students expect “anywhere, anytime access to anything” service.

Related Initiatives

The campus portal (initiative described in section 4.1.1) will help deliver online access to ICT services and applications for students, instructors, researchers and staff.

Partnership

Under the federated model, student computing services are delivered by ITS and colleges. This initiative will be implemented in collaboration with colleges.

This initiative provides an alternative to student computing model at some other universities. At those universities, the university leases computers to students and provides support. This initiative leverages the student ownership of computers. Several vendors will be interested in partnering with the University to support this model. Discussions are currently underway with one potential vendor, IBM.

4.3 Develop Campus Desktop Support Strategy

Initiative

Develop, in consultation with the University community, a strategy for acquiring, funding, deploying, supporting, maintaining and renewing desktop computers and their associated peripherals. The intent of such a strategy is to identify efficiencies, cost savings and to reduce the amount of time that instructors, researchers and staff spend on resolving computing issues rather than teaching and research.

Rationale/Needs

The document *Advantage U of S – Foundational Document for Information and Communications Technology at the University of Saskatchewan* outlined some of the background to the current way the University manages desktop devices. The federated model for ICT management has resulted in an *ad hoc* approach to the acquisition and management of these valuable assets. There are pockets on campus already following best practices for desktop computer management. While the University remains committed to the principle of “shared responsibility” for technology, the foundational document urges us to explore the potential for efficiencies of a more coordinated approach to desktop management and support.

The Gartner Group, a technology research organization, has developed a model for calculating the total cost of ownership of a desktop asset over its life cycle. This model has been used widely to help organizations understand these costs, many of them hidden or not well understood. Many organizations have made the effort to calculate these costs with

surprising results; costs were as high as \$5,000 per computer per year, with significant costs being attributed to troubleshooting problems, inadequate training for users, peer consulting time, and lost productivity.

Description

This initiative will develop a strategy for managing desktop computers and their associated peripherals. This strategy will consider:

- Funding models for acquisition and renewal (for example, purchase, lease, or budgeted utility funding models similar to telephone service).
- User help and training support models and costs (including the cost of the informal support provided by non-ICT support staff).
- The use of tools to automatically distribute, over the network, bug fixes to operating systems and applications software, security “patches,” and new versions of applications software.
- Software licensing models (site licenses, educational pricing, shared licenses among units).
- Clarification of the central, college, department and even individual responsibility for desktop support.
- Emerging desktop technologies such as tablet computers, personal digital assistants, and thin-client workstations.
- Best practices in industry and among comparable universities in Canada that can be used to achieve cost savings and efficiencies
- An assessment of the changes required to achieve these savings including the effect on the organization and the University’s preparedness for this kind of change.

Budget

	2003–04	2004–05	2005–06	2006– 07
Staff salary and benefits	ITS, college and administrative unit staff assignments		Required funding will be dependent upon the strategy chosen by the University in 2004–05	
Hardware				
Software				

ITS will reassign staff to this planning initiative from its existing budget (no incremental funding is requested). Contributed participation from other colleges and units will be required in the development of a campus strategy. The University can capitalize on the recently signed alliance with IBM to access additional expertise and experience in desktop management in large corporate and higher education environments.

Following development of the desktop strategy, the funding required to implement any strategy would be dependent upon the strategy chosen by the University.

Benefits

The development of the desktop strategy will take an overall look at the pictures of acquisition and support across campus. It will identify the key problems and issues for

students, faculty and staff. It will identify the costs of owning and using desktop computers now (whether explicit or hidden) and under a managed environment. It will engage many colleges and units in determining the best options for this University.

The subsequent wide-scale adoption of an adequately planned and funded desktop strategy will allow the University to:

- “Unburden” all faculty/ staff of desktop management responsibilities that they do not want by:
 - Reducing effort spent by faculty and staff on selection, acquisition, installation, patching, etc.; and
 - Limiting and maximize the effort spent by ICT professionals in staying current with the latest update issues and making informed decisions.
- Improve faculty/staff productivity in using ICT for research and teaching, by providing:
 - Timely support;
 - Adequate user training;
 - Compatibility and interoperability; and
 - Adequate desktop performance.
- Potentially cut costs through a variety of changes:
 - Standardized specifications and larger volumes, which can increase the leverage in the procurement process;
 - More standardized software to reduce the amount of time needed by help desk personnel to solve problems;
 - Standardized device specifications to reduce the amount of time needed to install “patches” to software (a fairly common occurrence), a service that can be done over the network as opposed to sending a technician to the device; and
 - If devices are more standard the time for repairs is reduced along with the associated inventory of parts.
- Improve ICT Security in order to:
 - Prevent losses such as loss of research data or loss of productivity resulting from a security breach or crash; and
 - Improve overall desktop security, a feature that is also an element of a security initiative outlined in section 4.1.
- Reduce ICT risks such as:
 - Data privacy lapses; and
 - Tarnished reputation of the University when University machines get infected.
- Improve utilization of ICT staff, which will:
 - Avoid duplication of efforts by ICT staff (such as in developing disparate disk imaging strategies and individually studying virus and vulnerabilities) and permit current ICT staff to be assigned to more discipline-specific support of faculty and staff or of improved local support service.

Partnerships

There would need to be careful consultation with all stakeholders. In addition, there are many outside organizations that desire partnerships/contract to assist with desktop management.

4.4 Continuous Improvement of ITS' Service Delivery Processes

ITS will review and improve, on an ongoing basis, its service delivery processes and organizational structure so we continue to provide services in an efficient and effective manner. Specific initiatives include:

- Review service offerings and rationalize which services are provided on base-budget and which are provided on a fee-for-service basis along with the rates for those services.
- Simplify and automate key business processes so that they provide self-service and makes it easier to for the University community to access our services.
- Change organizational structure, as required, to more effectively deliver service.
- Develop and implement a communications plan.