

4. Strategic Initiatives: 2008-2012

Nine strategic initiatives are presented for consideration in this section, five of which form the substance of Part Two of the plan. The purpose of this section is to outline the nine initiatives, indicate their importance and their urgency and, where possible, indicate what work is presently being done and when new work is expected to begin.

For initiatives 1-5 only summaries are given here; full details, including costs and sources of funding, are provided in Part Two. More detailed descriptions are provided for initiatives 6-9.

The nine initiatives are:

1. Support the University's Information Requirements for Planning, Performance Management and Institutional Reporting
2. Enhance the ICT Environment to Enable and Increase Research Success
3. Enhance the ICT Environment to Enrich Teaching and Learning
4. Simplify Business Processes and Improve Services
5. Develop Business Continuity Plans and Address ICT Security Risks
6. SiRIUS/PAWS: Eliminate the Funding Gap for Operations and Evolution
7. Provide Stable and Predictable Funding for New System Development
8. Convert the University Telephone System to VoIP Technology
9. Address ITS Space Requirements

4.1 Support the University's Information Requirements for Planning, Performance Management and Institutional Reporting (Details in Part Two)

The University of Saskatchewan (like universities everywhere) is struggling to address the demands for information from external agencies, governments, the public and other stakeholders. As well, our senior executives, deans and department heads are called upon to make critical business decisions that require timely and accurate information, and that information is not always available on short notice. We need to be better positioned to meet these requirements than we are now.

There are a number of reasons why it is difficult for us to get the information required, among which are the following:

- New system installations, such as SiRIUS, UniFi and About-US, improved services to students and others, and increased both the amount and the quality of data available at the University, but these systems were implemented primarily for operational purposes not for informational purposes. They contain an abundance of operational data but little high-level information. For example, while SiRIUS contains a great deal of data about students (such as the number of registrations in each class), this data must be transformed with appropriate business rules to create informational elements (such as "fte" enrollments). Additionally, our individual systems may not contain all the data required by the University to create the information it needs since that information often draws on data from multiple systems.
- Our present processes for converting data into information are often *ad hoc* and use a cumbersome collection of tools, many of which are not well suited to the task. As a result, the effort required to create the information is high (and so is the wait time to get the information). There is also a risk of error in the information provided, which can affect funding (for example, the Saskatchewan University Funding Mechanism, SUFM) or reputation (for example, *Macleans* ranking).
- Our operational systems contain current-value data, not historical data. We do not have a central depository that contains (all) the historical data (or information) required to perform longitudinal analyses such as modeling or forecasting.
- The University has not clearly defined its key performance indicators (KPIs) or benchmarks. This work is needed to determine the information elements that must be created and stored.

Work has been underway since May 2007, led by the Director of Information Management reporting to the AVP ICT, to develop an information strategy for the U of S. This work will address our institutional challenges in this area, focusing on issues relating to people, processes, organizational responsibilities and technology. The primary deliverable from the work of this initial year will be a comprehensive written report culminating in a recommended strategy for managing our information assets and anticipated implementation costs.

This initiative has three components:

- Develop the information strategy (underway). This strategy will address issues and deficiencies identified in our current information management practices, identify risks associated with those deficiencies, examine practices in place at or planned for peer

institutions and present a strategy for managing campus information assets as the University progresses into its second century.

- Establish the Director of Information Management position on a permanent basis within the Office of the AVP ICT to assume a lead role in managing our data/information vision, goals, priorities, design principles, and operating policies in support of the strategic directions and overall business goals of the University. The Director of Information Management will also facilitate the implementation of the information strategy.
- Implement the recommended information management strategy in order to provide the information that the University requires for evidence-based decision making, planning, performance measurement and reporting, in a timely and cost-effective manner.

Even without an institutional information strategy or information architecture, some work is already underway to enhance our longitudinal and operational reporting capabilities to meet immediate needs. Since the flow of data from transactional system to information systems is a key component of an information strategy, these initiatives will factor into the development of the University's information strategy.

- Institutional Analysis continues to develop iDat as an institutional reporting system that will enhance longitudinal reporting capabilities.
- SESD and FSD are currently pursuing the implementation of the SunGard Operational Data Store (ODS) product to replace the current student data store (Ganymede) and to create a data store for financial data to support student and financial operational reporting needs.

Full details are provided in Part Two.

4.2 Enhance the ICT Environment to Enable and Increase Research Success (Details in Part Two)

Research today is highly collaborative, involving teamwork, multi-disciplinary approaches and partnerships among faculty, students, universities, governments and industry. As well, it requires the collection and analysis of very large datasets. Research is also entrepreneurial and competitive.

Research relies heavily on ICT to collect, store, manage, integrate, mine, visualize and analyze data. This has long been true in sciences but it is now true in all disciplines, including the arts and humanities. ICT enables communications and collaboration among researchers anywhere in the world without the necessity for travel. ICT often provides researchers the “competitive” advantage they need to be leaders in their field.

This initiative will enhance the University’s research ICT environment (generally referred to as *cyberinfrastructure*) so that it helps increase research productivity, helps attract and retain graduate students and faculty, enables electronic communications and collaboration, supports experiential and discovery-based learning and helps fosters University engagement.

This initiative consists of two components.

The first component fulfills recent service commitments (such as the Digital Media Research Centre in Arts and Science and WestGrid) and builds on recent improvements to, and expansion of, the ICT research environment (examples include GIS, high performance computing and 3-D visualization). These service improvements were funded primarily from one-time (“soft”) monies (including ITS contingency) without an increase in operating budget. We intend to use ITS contingency to continue providing these services this year and during the four year planning cycle (subject to the availability of funding). The funding will cover staff salaries and benefits (primarily to extend existing term positions) in order to:

- Continue support for the use of digital media technologies especially in arts and humanities (through the Digital Media Research Centre in partnership with the College of Arts and Science).
- Continue support for Geographical Information Systems (GIS).
- Continue support for advanced 3-D visualization (in partnership with the Saskatchewan Resource Council).
- Provide (and support) more ICT tools for electronic communications and collaboration (i.e. beyond e-mail).
- Increase the ICT advice and assistance available to researchers in developing research proposals and to those undertaking research projects that have a significant ICT component.
- Provide ICT advice and assistance to new faculty to help them establish their research and teaching programs quickly.
- Continue to provide ICT advice and assistance as required within the University’s accountability process for CFI proposals.
- Help implement the mass data storage and AccessGrid collaboration facilities recently approved by CFI to be located on our campus (in collaboration with Dr. Ray Spiteri, principal investigator, and WestGrid/ComputeCanada).

- Operate the High Performance Computing Research Facility recently developed in the Spinks addition to house specialized research servers that require high electrical and air conditioning capacity.

New funding will be required to further enhance the ICT research environment in the following ways:

- Provide system management support to free researchers from the time-consuming and complex tasks relating to workstation and server administration (such as applying system upgrades and security patches).
- Provide automated tape backup services for research workstations or servers to reduce the risk of losing research data in the event of system failure.
- Support the expanded use of ICT tools by more researchers in more disciplines.
- Provide ICT staff resources to help manage research projects that have a large ICT component.
- Provide additional support for researchers and instructors that require 3-D visualization.

Full details, including costs, are provided in Part Two.

4.3 Enhance the ICT Environment to Enrich Teaching and Learning (Details in Part Two)

Over the past few years the demand for ICT tools used to support instruction on this campus has increased dramatically. Technologies that have been requested recently include student response systems (“clickers”), Elluminate⁴, Apreso (now Echo360)⁵, blogs, wikis, PAWS course tools, podcasting, LON-CAPA⁶, online surveys and many others. In addition to an increasing variety of tools, the number of instructors and students to be supported and assisted in using such tools has also increased. The demand for new tools continues unabated and this, in turn, increases the demand for support. The services provided support both face-to-face and online instruction. Some tools introduce new capability; others help by streamlining long-standing functions such as grading.

ITS activity in this area is driven largely by requests from colleges and individual instructors, from instructional designers and CCDE leaders, from ULC staff and the E-learning Priorities Committee, from the Academic Support Committee of Council, and from information gleaned from staff research. ITS staff also participate in Campus SK committees and activities, and are involved with faculty on campus in research related to teaching and learning technologies.

Part of this initiative is and will continue to be funded from existing ITS sources (including contingency) but to move further will depend on securing new funding.

New funding will be required for some or all of the following:

- to provide ongoing maintenance and support of web application to support SEEQ online course evaluations;
- to provide tools and services to support the use of online examinations (includes exam databank and automatic exam creation);
- to provide tools and services to support the use of e-portfolios for students;
- to provide additional tools for delivering and managing online course elements integrated with PAWS and/or a course management system; and
- to extend hours of support for core ICT services.

Supporting teaching and learning through innovative technologies is an important part of the ICT mandate and we will continue to provide both leadership and support. This enriches the student experience both by exposing them to new tools and by assisting their learning.

Details are provided in Part Two.

⁴ Elluminate is a web-based collaboration environment that enables instructors to have real-time discussions with students supported with PowerPoint slides, web sites, whiteboards and shared applications.

⁵ Apreso/Echo360 is a system for easy lecture capture and replay using rich media format.

⁶ LON-CAPA is a web-based course management system with particular emphasis on automated assessment. It features a large inter-institutional repository of shared instructional and assessment resources.

4.4 Simplify Business Processes and Improve Services (Details in Part Two)

The goal of this initiative is to help the University improve its services. We will do this by providing technical infrastructure, support and training that will allow business units on campus to simplify their business processes and decrease the turnaround time of many services.

This overall initiative will consist of a number of projects, each targeted at making processes simpler and more efficient through the use of new or improved technology.

Among the key deliverables of this initiative are:

- evolution of the University's identity management, authorization and authentication system so it continues to meet institutional needs;
- a document management and workflow system for the campus;
- a web page content management system for the campus;
- assistance to the College of Dentistry in implementing their new dental clinic system;
- a collaboration with the Consumer Services Division to develop an online campus store;
- a problem tracking system to support operations in ICT help desks on campus, both ITS' and others;
- a system to enable students to review progress toward a degree while online and allowing colleges to automate degree audits; and
- more online services for students, including enabling students to purchase print pages online for the Campus Print Accounting System.

The primary objectives are to enable units to employ automated business processes wherever possible (in areas such as electronic document management, electronic web page content management and electronic workflow) and to increase the number of online, self-directed services for students and staff, thus providing anywhere, anytime access.

Expected outcomes from this initiative include:

- Improved services to students by increasing the number of automated processes. For example, student appeals can be automated so the process begins with a student entering an online form, which will automatically be directed to administration for processing.
- Reduced time invested by departments and units in web publishing by providing electronic support for updating web pages.
- Accurate and up-to-date web content and reduced dependency on IT support by providing easy-to-use automated publishing, versioning and archiving functionality.
- Reduced paper use and paper flow for business processes at the University. Reduced time to complete a business process because paper flow is replaced with electronic processes.

Details are provided in Part Two.

4.5 Develop Business Continuity Plans and Address ICT Security Risks (Details in Part Two)

The University relies on ICT for its teaching, learning, research and business activities. As doing academic or administrative work becomes synonymous with using ICT, our community (students, instructors, researchers, staff and even the public) expects service availability that approaches 24x7⁷. A recent survey of several administrative departments indicated that the maximum tolerable downtime is one day for the ICT services upon which they rely.

In reality, system failures may cause ICT services to be unavailable for days (component failures), weeks (major server failures) or even months (fire or vandalism of a computer or network centre such as those located in the Administration or University Services buildings). Likewise, Internet attacks can disrupt services for periods of days or weeks (until the compromised servers or desktops are “repaired”). As was noted in *The Second Integrated Planning Cycle: Emerging Trends and Themes*:

“Most aspects of the University’s activities are increasingly reliant on technology in general and major systems in particular. System failure, encroachments from external sources ... are all foreseeable challenges”.

The affected services may include student registration, grade entry, payroll, purchasing, accounting, donor processing, e-mail, on-line course content delivery, PAWS, the campus website, the Library, campus network, Internet and telephone services.

The University has been and will continue to be subjected to security incidents, with impacts ranging in severity from e-mail spamming to reports of copyright infringement to virus infections to major interruptions in availability of key ICT resources. The data stored in our research systems, the systems that store student records and our financial systems represent a valuable target for intruders.

Ensuring the safety and security of our systems, our data and our users is a critical responsibility. We must be continually vigilant and exercise due diligence in mitigating risk to our ICT infrastructure and to the business processes that rely on that infrastructure. The collaborative nature of research and education requires a level of connectedness and openness that complicates the use of ICT security controls, and the largely unfettered access provided to students, faculty and staff (including increasing numbers of visitors and guests) makes the University an especially difficult environment to protect. Yet we must do all we can to ensure the security of our systems and our data; to safeguard against service interruptions, computer misuse, unauthorized disclosure of University data and the damage to the University’s reputation that could result from a serious security incident; and to protect our users.

This initiative will close the gap between the expectations for ICT service availability and the University’s ability to meet those expectations. It will reduce the likelihood of significant disruptions to key academic and business processes due to system failures or security breaches as

⁷ While no individual student, faculty member or staff member requires all services to be available at all times, the needs of the institution as a whole combine to produce an expectation approaching 24x7, with little tolerance for service disruption.

well as improve our ability to restore services following those failures. It will also help protect institutional data from unauthorized disclosure.

The initiative has three components.

- Develop the University's business continuity and resiliency plan related to significant failures of institutional ICT systems.

The plan will be developed in consultation with colleges and administrative units as well as with senior University management. In order to develop the plan, the University must identify the impact of system failures of varying durations as well as the strategies, with the associated costs, that can be undertaken to reduce the risk of failure, to reduce the recovery time from system failure, and to continue University operations in the event of a failure. The plan will contain only the strategies that cost-effectively address the institution's tolerance for risk.

- Implement the business continuity and resiliency plan.
- Improve the security of University ICT assets and improve the University's response in the remediation of ICT security breaches.

New funding will be required for the second and third components listed.

Details on this initiative, including costs, are provided in Part Two.

4.6 SiRIUS/PAWS: Eliminate the Funding Gap for Operations and Evolution

Both SiRIUS and PAWS are operating with a budget shortfall. Presently the deficits are being covered from a variety of one-time sources. This is not sustainable. Critical campus services are at risk. Both have been to PCIP several times. Some funding has been provided, but significant gaps remain.

SiRIUS

The SIS Division (now part of SESD) is the unit responsible for the operation, support and evolution of our new student information system. The implementation was declared complete in the fall of 2006 but parts of SiRIUS have been in operation for more than two years. Now that we have been through two full academic cycles we have a much better understanding of what is required to support the system than we did when estimates were provided to the Board of Governors in 2003. We now know that the operating budget approved then (\$1.67 million) is insufficient. A request was submitted to PCIP in May 2007 to eliminate the gap.

A two-stage increase was requested: an immediate, one-time allocation of \$800,000 to cover the period to August 31, 2008 to permit the extension of some critical term positions, followed by a permanent adjustment on the order of \$1 million to make these positions permanent. \$300,000 was allocated on a permanent basis and \$150,000 was transferred from ITS on a one-time basis. This leaves an immediate gap of \$350,000 to extend contracts to August 2008 and a decision to be made on the \$1 million permanent adjustment. This request is consistent with Audit Services' recommendation to senior administration.

SiRIUS is based on a commercial product—SunGard Higher Education's Banner. As the Si! Project neared completion it became apparent that the cost to operate, support and evolve the new system had been underestimated in the following respects:

- i. The extent to which the purchased software had to be modified was not anticipated at the time the original estimates were made. It was estimated that the purchased product would meet 85% of our intuitional needs, with the remainder met by either changing business processes or modifying the software, and the budget was set accordingly.

Developing a full understanding of which processes could be changed required that the new system be operational through a number of academic cycles. That has now happened, and while the institution has been very successful in changing some practices, others that are core to the University's business could not be changed at this time. In some cases, grade approval for example, our processes are grounded in academic regulations. In other cases, changing practices would require some business units to take on considerable manual processing, estimated to require 10 FTE annually.

It must be noted that not all modification is discretionary; some modifications are required by mandatory processes and practices (to comply with regulations and policies), others stem from core academic principles, while others are required to interface with our technical infrastructure (such as U-Who and SSAM). A full list of the customizations and discussion of their rationale was provided as part of the PCIP submission and is available on request.

- ii. There is still significant work required in order for the full campus community to use the new system effectively and leverage the substantial investment already made.

The purpose of the *Si!* Project was to implement a base student information system and migrate core business processes into it. Significant work remained at the end of the implementation project, either because it had been removed from the project's scope or because new opportunities for improving business processes had been identified, the magnitude of which was not anticipated in the original operating budget. This work has been taken on as part of the ongoing evolution of our student information system.

There were a number of reasons why some of the intended work was not completed during the implementation project. SiRIUS became operational in stages, and the transition to supporting it occurred earlier than expected. This consumed resources that would otherwise have been allocated to implementing other parts of the system. Additional requirements were added as the work progressed and new needs emerged, such as implementing a separate system to support student recruiting, implementing an examination-scheduling application, automating admissions for some non-direct entry colleges (Dentistry and Pharmacy & Nutrition) and building a reporting system. Unanticipated costs arose, both direct and indirect, including office renovations, adding additional space for training, and extending the contracts of staff supporting the work of the colleges (the "coaches"). Finally, obtaining trained staff was difficult early on in the project's life cycle, meaning some work had to be deferred.

- iii. Early in the *Si!* Project it was decided, at least implicitly, that new funding would be sought to support ongoing enhancements to the system. We now understand that there needs to be ongoing capacity to facilitate necessary enhancement, rather than relying on episodic funding requests to support critical enhancements such as degree audit.
- iv. While we knew support for reporting was a critical requirement, the need to build a full reporting infrastructure to create the numerous customized reports and data extracts needed to support business processes was unanticipated when the original budget was set. For performance and security reasons a separate technical infrastructure beyond the base Banner product was subsequently found to be necessary. This led to the "emergency" development of Ganymede/Publisher, which has already become crucial to the operations of colleges and administrative units. The funding to build it came from savings in the implementation project, but there is no funding available now to operate it or to continue its development, and it certainly was not part of our planning for this project.

The submission to PCIP laid out the consequences of not providing the increased funding required. Most directly we would lose a significant number of the highly trained staff on which the success of this initiative depends. These could not be replaced later on without a significant reinvestment in training costs. Other consequences include risks to business processes, jeopardizing some contractual obligations, providing inadequate support to users, and being unable to meet demands for new functionality.

We have been far from extravagant in our expenditures on our major administrative systems. Indeed, comparing our expenditures with those of other institutions indicates that our expenditures, while substantial, have been quite modest:

Institution	Total Implementation Cost (Student, HR, Finance)
U of Saskatchewan	\$18 million
U of Alberta	\$50 million
McGill	\$30 million

We will not benefit as much as we might from the great work our staff have done implementing them if we fail to provide adequate ongoing support for the operation and evolution of these crucial institutional systems; we can't let that happen.

PAWS

PAWS has been a resounding success for the University. With more than 15,000 users every day and a broad base of service providers spanning the campus it has achieved its goal of becoming the campus standard for online service delivery. It serves the entire University community – students, faculty, staff, and alumni – and connects with the goals of integrated planning in many important ways. It is a central element in our thrust to improve service delivery, offering online web-based access to a wide range of University services from anywhere at any time. It has also played an enormously important role in standardization by consolidating institutional processes for identity and access management, by providing standard tools for course management, collaboration, communication and personal calendaring, and by providing a standardized single-sign-on interface to our administrative support systems. But it has been running on a shoestring budget.

A number of submissions have been made to PCIP over the past three years (most recently in the fall of 2006) to provide permanent base budget funding to address the cost of operation, support and evolution. The present cost is close to \$800,000 annually. \$150,000 was allocated in the spring of 2007 and \$315,000 has been found from other sources (Student Computing Fund, System Development Fund and ITS operating funds), but this leaves an annual shortfall of more than \$300,000. ITS has been covering the deficit from its contingency for four years and this is not sustainable. A number of critical positions are on term contracts and this is a serious risk.

With the staffing levels in place now we struggle to meet even the most pressing needs. We can defer requests from our campus community for only so long. New services need to be deployed, we cannot turn away requests for assistance from students and faculty to the ITS Help Desk, and we need to support faculty in using PAWS in their teaching.

New permanent base budget funding in the amount of \$300,000 is requested to close the gap.

4.7 Provide Stable and Predictable Funding for New System Development

Bob Rae refers to “the tyranny of one-time funding.” Following several external reviews in the 1990s it was acknowledged that the University was under-invested in support for new system development. This meant that critical institutional projects had to seek funding on a one-by-one basis, frustrating project proponents and stifling planning. To remedy this, in 1999 the University established the System Development Fund (SDF) at \$1 million per year to support the development of new systems. This provided those with executive responsibility for systems development with the capacity to develop longer term plans so that emerging priorities could be addressed within a longer term comprehensive strategy.

This was an enlightened approach but, unfortunately, the SDF has been eroded in the intervening years through permanent allocations to ongoing requirements (such as operating support for About-US and SiRIUS). In 2007 less than a third of the original \$1million remains for the purpose for which the SDF was intended, which means we are back to seeking funding on a project-by-project basis.

We do not secure the funds necessary to repair roofs or renovate classrooms one project at a time, nor should we secure funding for critical ICT projects one project at a time. A better model is to determine how much we are prepared to invest in this technology, allocate it and let our ICT governance model make our technology decisions rather than forcing PCIP to do it.

We are calling for a return to the SDF model as instituted in 1999, with funding to reflect 2007 demands and 2007 costs. Both demands and costs have escalated since 1999, but what is left in the SDF is approximately \$385,000 in 2007 dollars—far short of what is needed to meet 2007 demands.

Our request is for a \$2 million allocation to the System Development Fund, beginning in year one of the new planning cycle.

4.8 Convert the University Telephone System to VoIP Technology

Responsibility for telephones and telephone services was transferred from FMD to ITS part way through the last planning cycle, along with the Telephone Services staff, budget and existing practices, in order that planning for voice communications could be strategically aligned with planning for data communications which was already the responsibility of ITS.

Work already in progress to renew the campus data network (through the USR-net project) had already set the stage for the University to capitalize on the convergence of technologies for voice and data communications. With the assistance of funding from CFI, the Province's Innovation and Science Fund and contributions from vendor partners we were well-positioned to follow industry trends to move to Internet-based telephony (voice over IP, or VoIP).

Because ITS staff were intensely engaged in completing the USR-net project (10,000 data connections) there was little time available to work on the wholesale conversion of our 6,000 telephones. Some preliminary work, mostly in areas of new construction, resulted in the introduction of some 600 VoIP phones to the fleet, but more detailed planning awaits.

This is not urgent work since there is still life left in our conventional telephone system, but it is work that will need to be done within the next planning cycle since vendors will not support two technologies much longer. We will begin detailed planning in the first year of the new planning cycle and present a plan and budget to PCIP for work to be completed over the next three. We estimate the total cost to be on the order of \$3 million.

4.9 Address ITS Space Requirements

Staff in ITS are scattered in some dozen locations around the campus—from the main office area in Physics, to the space for the Networking group in Peterson, to the Help Desk space in Arts, to Technical Services in Education. Servers too are located in several different areas. It is very difficult for staff to work when the facilities for which they are responsible are scattered and when people with whom they work closely aren't close at hand.

The size of the ITS staff complement, the highly specialized nature of some of the space (such as enhanced power and cooling for server rooms), and the diversity of responsibilities makes it extremely difficult for the University to meet ITS' needs. Nevertheless we need to do much more than we are presently doing.

Several potential solutions are under investigation, including the University Services Building expansion and the Place Riel expansion. We will continue to work with Space Planning and the IPO to evaluate options and develop the necessary plans. High priority requirements include:

- office space for every staff member;
- co-located space for staff who work together;
- secure server rooms with enhanced power (including UPS) and cooling;
- more accessible space for the Help Desk and associated services; and
- a main office that meets contemporary professional standards.