Introduction

As a successful research-intensive institution, the University of Saskatchewan (UofS) has taken several steps to position information technology as an element in its strategic thinking and planning. These steps include the relatively recent creation of the role of Chief Information Officer (CIO) to serve as the institution’s senior-most IT leader, the establishment of close links to national research initiatives such as the Canadian Light Source (CLS) and WestGrid, ITS’s support of the province-wide distributed nursing program, and the deployment of critical infrastructure in areas such as networking and identity management.

In this regard, the UofS appropriately reflects the contemporary perspectives of leading universities around the world where information technology is seen to be of fundamental importance to the academic enterprise. However, there is much more to be done. We believe that it is of increasingly critical importance that the UofS more clearly position and support information technology strategy and the service functions of University’s central unit, ITS, as strategic enablers whose primary purpose is to ensure the achievement of the University’s overall strategic objectives.

We were impressed with the many and significant accomplishments of ITS. These successes came across loudly and clearly from the considerable documentation and analysis presented by that unit’s self-study report. The achievements were largely corroborated by submissions and comments from the UofS community during our productive but all-too-brief campus visit during which we met with dozens of stakeholders from many walks of campus life. Several people commented on very positive improvements within ITS during the past 5 years. Indeed, whereas campus stakeholders certainly have concerns and pointed to areas they see needing improvement in ITS, the general tenor of this review report is developmental (improving through greater adherence to standard/best practice) and not turn-around (which would imply the ITS organization and the institution are at odds, requiring more radical action).

Our interviews and the overall scope of data gathering undertaken to support the observations and recommendations contained in this report would have benefited significantly from greater contact with University leadership. We did not hear from the President, any of the Vice-Presidents other than the Provost (who sponsored the IT review), and very few Deans or department heads. We hope that this lack of senior level engagement in the review process has not materially diminished our ability to identify and provide advice on areas where improvement and advancement is possible in the IT environment of the University.

Our report is oriented around the following three key areas that we feel need attention at the UofS and constitute prerequisites — or at the very least, co-requisites — to much-needed improvements in IT service delivery:
• IT Governance

• IT Leadership Model

• IT Funding

With reference to the IT leadership model, we are exclusively addressing issues of roles (and role clarity), mandates and authority. This is separate from the capabilities and accomplishments of UoS IT leaders, notably the CIO and ITS Director, both of whom were frequently singled out as valued colleagues in our interviews with campus stakeholders.

Summary of Recommendations

In the sections of the report that follow, discussion about various issues leads to numerous recommendations that are embedded in the narrative, some more significant than others, and some that in part overlap. The bullets below capture the essential features of the most important of the recommendations, and they constitute a brief synopsis of our report.

• Create a formal IT governance structure to develop policies and procedures, monitor and enforce the policies, approve and prioritize work, promote informal discussions, and arbitrate disagreements.

• Develop governance practices that clearly differentiate and assign responsibility for governance, service delivery and departmental roles.

• Communicate and reinforce the CIO’s role at UoS, highlighting the institution-wide strategic and operational mandate of the position.

• Explicitly empower the CIO to propose and be accountable for policies and standards, set priorities, allocate resources, and ensure accountability for major IT campus investments in information technology, systems, and services.

• Identify a core set of IT services and provide them to all faculty and staff without fees.

• Greatly diminish the dependency on chargeback funding within ITS through budget reallocation. Charge financial services with creating university guidelines for chargeback services with an annual review of compliance.

• Create the following roles reporting to the CIO: enterprise architecture, information security, service/relationship management, and portfolio management.

• In partnership with identifiable business owners, vest the authority for enterprise system planning, implementation, operation, support and campus-wide standards with the CIO.

• Consolidate enterprise systems technical staff resources within ITS.

• Implement a set of standard performance metrics and measures that include the operational, customer service and strategic performance aspects of IT.
• Engage the campus stakeholders in planning, resourcing, and implementing an IT service management framework, with initial emphasis on the service support disciplines.

**IT Governance Structures and Processes**

There are numerous committees, boards and councils at the University of Saskatchewan that are in some way involved in IT governance (ITG). Those listed below were taken from the self-study, although there may be other IT committees of which we are not aware.

- Campus Advisory Board for Information Systems (CABIS)
- Academic Support Committee of Council
- E-Learning Committee
- Classroom Development Committee (new committee being formed)
- Undergraduate Student Forum
- SRnet (Saskatchewan Research Network) Board.
- Campus IT Managers Forum. This group consists of senior IT staff from ITS, colleges and administrative units. The group meets monthly to discuss IT service changes and requirements.
- Enterprise Systems Planning Committee
- Technical Advisory Committee on Better e-Learning (TACOBEL).
- Student Computing Forum
- Portal
- Webpage Content Management
- Geographical Information System
- High Performance Research Computing

There is brief description of many in the list above provided in section four of the self-study, but the role, membership, authority and accountability are not defined for all of the committees. Moreover, our discussions with members of some of them revealed that the relationships among the committees and their respective roles and responsibilities do not appear to be broadly understood. It appeared that some of the committees simply served as opportunities for discussion and information sharing, rather than decision-making, accountability and execution. Finally, the number of committees seems large to us.

With these observations in mind, we suggest that an initial step in developing an IT governance structure is a review of the roles and responsibilities of the existing committees. Which serve a useful role in the stewardship of IT resources and what is that role? Do their agendas overlap? To whom do they report and why? Is the committee advisory to some other body or does it have decision-making authority?

Within ITS, there are also governance groups that inform ITS decisions. We strongly suggest that the same exercise should be conducted for these groups. In our discussions we heard that communication within ITS was not always adequate, and that information about internal ITS
activities was sometimes first learned at committee meetings outside of ITS. More specifically, stakeholders indicated that, while the ITS senior management group has a high level of technical skill, the same could not always be said for their communications skills. The hiring earlier this year of a communications specialist within ITS can compensate for the lack of communication skill, but only to a degree. Communication is everyone’s responsibility.

Once clarity with respect to the role, membership, authority and accountability for the (remaining) committees is established, the CIO’s office can determine where the governance gaps are and assemble the committees in a structure that can both inform and interact with the Provost’s Committee on Integrated Planning.

The Provost’s Committee on Integrated Planning (PCIP) is recognized as an authority for discussion and decision-making. It is clear from the University of Saskatchewan’s website that “PCIP provides the link between the academic priorities of the university and its business and budgetary priorities. PCIP is the administration’s planning and budgetary body and is responsible for:

- the structure of integrated planning
- recommendations to the Board of Governors on operating and capital resource levels
- review of plans of academic and administrative units
- making resource decisions related to the university’s integrated plan and managing the Academic Priorities Fund.”

Based on these observations, we recommend that the PCIP be identified as the foundation for the University of Saskatchewan IT governance. By articulating the function of each governance group and the relationship to PCIP, the University would:

- Clearly identify which of the IT committees have a formal relationship with PCIP
- Identify which committees are for discussion and information sharing purposes and which are charged with making decisions or recommendations to more senior committees
- Ensure stakeholders are engaged in priority setting
- Ensure that ITS is not seen as setting priorities and launching projects in isolation from business or academic owners
- Limit the tendency for units to make their own independent IT investment decisions irrespective of campus wide implications or system interoperability

**Recommendations**

1. *Create a formal IT governance structure to develop policies and procedures, monitor and enforce the policies, approve and prioritize work, promote informal discussions, and arbitrate disagreements.*

2. *Develop governance practices that clearly differentiate and assign responsibility for governance, service delivery and departmental roles.*
3. *Set as a goal that the governance model will leverage the information assets of the UofS, reduce expenditures and improve operations.*

4. *Develop a shared service model that contains the elements of price transparency, service culture, good business process, standardization, continuous improvement and responsiveness.*

5. *Determine a process to recognize innovative solutions that solve problems at a local level and systematically promote them to university-level shared services.*

**Creating a Governance Framework**

The UofS should focus on the key areas of the governance process, including:

*Decision-making:* The IT governance model should assign decision-making authority for IT initiatives and services at levels throughout the organization to leverage the collective expertise and authority of the participants.

*Resource Allocation:* IT governance should provide a structured, rational and ongoing methodology for making collaborative decisions on how to concentrate and deploy resources to support initiatives that cross functional or organizational boundaries.

*Collaboration:* An IT governance infrastructure will provide increased opportunities for horizontal and vertical collaboration and communication in specific IT specialties, academic and business functions, and at the enterprise level.

*Standards and Policy:* IT governance provides a shared authority to propose, select and promulgate standards and policy for IT that provide needed guidance to capture efficiencies supported by increased shared use and interoperability of technologies.

*Transparency:* Customers need to know what services are available from which organizations and how to access those services. IT governance, business intelligence, and a governance support organization (“Governance Office”) could elevate the quality and quantity of this information available to stakeholders.

*A Framework for Discussion:* A university-level framework from the University of Illinois has been included as an appendix to facilitate further discussion. This model supports the tenets described above and provides a framework for governance model. The model is complex because it includes many elements of governance and relates them to each other. Not all elements need to be included in a successful governance implementation but, if they are, the model shows how they are connected.
IT Leadership

The role of the Chief Information Officer (CIO) is still relatively new in the Canadian higher education context. However, that position is becoming increasingly common in this country and is already well established in major American research universities. While there is some variation based on institutional context, the CIO is normally given the mandate to define a strategic vision for IT as an enabler of research, education, and administration across the entire institution.

Directing a central IT organization is one important aspect of the role of a CIO, but it is not the only one. The CIO is also responsible for ensuring IT investments align with the strategic priorities of the institution, that projects follow a consistent and well-understood methodology, that the institution-wide IT architecture is coherent and flexible, and that appropriate governance mechanisms exist to ensure effective priority setting and resource allocation. It bears repeating that these are institution-wide responsibilities.

We reviewed the position profile for the CIO at the University of Saskatchewan and found it to be consistent with the generally accepted responsibilities of a CIO. However, our observations indicate that the UofS community does not seem to know what to expect from their CIO. We believe this is because the CIO’s mandate has not been adequately communicated and supported by the university executive leadership, and the appropriate scope of authority required to set the role up for success is not yet in place.

The position of CIO at the University of Saskatchewan must have unambiguous support from the top-level administrators, most notably the President, the Provost, the Vice-Presidents and their Associates, and, of course, the Deans.

We heard from a wide variety of campus stakeholders that the institution urgently needs someone to define IT strategy for the university, to set standards, and to allocate resources to priority initiatives. There did not seem to be recognition that these activities constitute the role of the CIO. Most people we spoke to found it difficult to differentiate between the CIO and ITS Director roles, even though the CIO has consciously distanced himself from association with ITS in order to more fully focus on strategic issues.

The strategy-operations split that exists between the CIO and the ITS Director leads the ITS department to feel it is without an executive champion. The ITS Director does not have a position description. The current incumbent has simply inherited the scope of responsibilities of incumbents long ago when the role of information technology was very different from today in both complexity and importance. The university runs its academic enterprise on information technology infrastructure and systems; the ITS Director should have unambiguous role clarity.
In order to address this absence of role clarity for the CIO and ITS Director, we offer the following recommendations.

**Recommendations**

6. Communicate and reinforce the CIO’s role at UofS, highlighting the institution-wide strategic and operational mandate of the position.
7. Explicitly empower the CIO to propose policies and standards, set priorities, allocate resources, and ensure accountability for major IT campus investments in information technology, systems, and services.
8. Hold the CIO accountable for the judicious exercise of this level of authority and the major deliverables of the IT strategy.
9. Immediately create a position profile for the ITS Director.
10. Establish institution-wide roles in the following areas, each reporting directly to the CIO:
   a. Enterprise Architecture
   b. Project Management
   c. IT Security

**Figure 1** - Typical CIO office organizational structure.
External Review of Information Technology Services
University of Saskatchewan
Report of the Review Committee

IT Funding

Amount of funding

The Self Study report indicated that ITS spends approximately $20M annually. Through various discussions and reviewing the numbers of people involved in IT in the colleges, Library and elsewhere, the committee learned that (approximately) an equal amount is spent annually on IT outside of ITS. If this is indeed roughly accurate, we feel that the University of Saskatchewan is not out of line with other universities in terms of total IT expenditures. In other words, the UofS is not demonstrably under-spending on information technology. However, the manner in which it is spent is problematic.

Allocation of funding

There is a considerable amount of funding for IT available in the various units outside of ITS and a high degree of latitude in how it is spent. Indeed, the committee heard on numerous occasions that if a unit has money to spend on an IT project, it can do so without reference to similar projects or infrastructure elsewhere on campus. We learned of a CV system that had been developed exclusively by and for Engineering that was abandoned when budget reductions made it impossible to sustain the system. Currently, there are concurrent CV system developments occurring in the College of Arts & Science and in ITS (on behalf of the College of Medicine). We also learned of an ITS project (initiated and funded by the College of Law) to develop a student information system that appears to duplicate the functions of the existing Banner System.

Multiple instances of development that support marginally different needs (perceived or real) are wasteful, and do not serve the overall interests of the institution. It is a symptom of a lack of effective IT governance and resources being allocated inappropriately. This issue will be discussed more fully in the Standards and Services Offerings section later in this document.

Charging fees for Services

Charging a fee for a service such as basic local phone service, voice mail, access to the internet, and similar services, provides no intrinsic value. Charging such fees is simply moving money around within the institution and incurs expense. The same argument can be made for other items that are essential to a productive working environment (e.g., up-to-date hardware and software) or for the mitigation of risk to the institution (e.g., anti-virus software, encryption). The only compelling reason to charge a fee for service is to prevent excessive use or curb unreasonable requests. Thus, it makes sense to charge for things like backup services, long distance charges, and installation of network drops. Such charges need not recover full costs (it is, after all, still just moving money around within the institution), but need be only large enough to keep use/requests reasonable. Indeed, charging full costs is often counter-
productive in that the perception may be that the same service can be obtained less expensively through other means, leading to attempts to “get around the system”, with all the collateral problems that can bring.

As noted in the self-study, the amount of base funding provided to ITS is not sufficient to pay for the salaries and other expenses it currently incurs. A consequence is that a significant amount of its expenses are covered by fees charged for various services. These fall into two categories: contracted amounts for various development activities such as the CV system for the College of Medicine mentioned previously, and fees for regular commodity services such as phone services, email services, annual service fees for network drops, etc. We heard numerous expressions of displeasure about the latter fees, in terms of appropriateness, consistency and magnitude.

**Basic Commodity Services**

There are a number of services that essentially all faculty and staff need in order to effectively do their jobs. These include such things as phone service, email services, access to a campus calendaring system so that meetings can be easily scheduled, access to the internet, and so on.

As noted, there is substantial funding available for IT in units outside of ITS. However, the committee heard that spending on equipment was uneven, and that some faculty and staff were using equipment that was past its useful life, and using software that was long past its service window. This situation is not good for morale and also poses security risks.

**Recommendations**

11. *The University should identify a core set of IT services that are to be provided to all faculty and staff. These should not be subject to fees but rather should be funded centrally through ITS. As a minimum, these should include local phone service (and perhaps a base amount for long distance service), voice mail, email and calendaring service, and access to the internet.*

12. *The University should consider implementing an institutional desktop roll-over program, where workstations (or laptops if that is the platform used) are replaced on a regular cycle. This program should be centrally funded and managed through ITS.*

Note that implicit in these two recommendations is a reallocation of budget to ITS from other units on campus.

**Contract Services –Steering Effects**

A significant source of ITS funding is derived from “contract services”. Units outside of ITS that have funding for an application enter into a contract with ITS to develop the system, for
example the CV system for the College of Medicine and student administrative system for the College of Law. The ITS department depends on this income to support some of its expenses, so the inevitable question arises as to whether a project, desired and funded by a unit outside of ITS, might be developed by ITS even though doing so might not be in the best interest of the institution overall. This is typically referred to as “local optimization at the expense of the global good”. While the Director of ITS claimed such circumstances did not arise, we believe that this funding model, at the very least, provides the appearance that ITS is in a conflicted position.

As a postscript to this section on IT funding, we note that the ITS self-study is an extraordinarily detailed and comprehensive document. It describes virtually all facets of the unit’s operations and points repeatedly to constrained resources as the cause of a problem or increased funding as the sole means of improvement. Likewise in our meetings with the ITS management team, tremendous emphasis was placed on inadequate resources.

Our report contains specific recommendations aimed at improving the overall funding model for ITS. If implemented, the changes will provide a far more stable resource planning base for ITS and greatly reduce the problematic steering effects of the current model. We have also recommended new senior level IT roles reporting to the CIO, the creation of an Information Security Officer, and the consolidation of enterprise systems technical staff within ITS. Collectively, these recommendations would further enhance and solidify the resource base available to the CIO and the ITS Director.

Assuming these steps are taken, we believe the CIO and ITS will be adequately provisioned to effectively execute their current mandate and scope of services and to consider new opportunities by leveraging existing resources.

**Enterprise Systems**

At the UofS, we heard that having an IT system characterized as an enterprise or institutional system carried significant importance. The reason offered by some stakeholders was that this determined whether the costs associated with a particular system are eligible for central/incremental funding or must be funded by individual units. We therefore believe it is important to establish an unambiguous definition of enterprise systems that can be used (and modified as appropriate) by the University as a starting point for a new approach to planning and supporting enterprise systems.

Enterprise systems include software applications – and the associated information - that provide core services used across the institution and on which other systems often depend. They also utilize structures that permit the integration of data between enterprise systems. Although there may be “shadow systems” that replicate or augment some of the information maintained in an enterprise system, only an enterprise system can be viewed as the system of record, containing the primary source of authoritative institutional data. Such systems typically
have the following characteristics: ¹

- form part of the University’s integrated business environment, are mission critical in supporting core processes and key academic and administrative functions;
- are considered broad impact systems;
- are approved as ‘sole authoritative sources’;
- present business risks that must be managed, and a focus for audit concern;
- require significant resources for implementation, maintenance and ongoing support;
- are deemed to be Enterprise Applications under University policies.

At the UofS today, ownership of enterprise systems and the associated technical resources required to support them is at the functional unit – or, business owner - level. Under this model, the Human Resources department ‘owns’ the HR system and data, the Finance department ‘owns’ the Finance system and data, etc. Although some ITS staff are assigned to these functional areas, they are fully managed by the business owner rather than by ITS.

We did not determine if effective advisory committees exist to ensure campus-wide needs are assessed and factored into the support and enhancements of enterprise systems, and we hope this is the case. But even if such advisory groups exist, they will tend to focus on each business area in isolation of any cross-cutting business process requirements that span organizational boundaries. The result is that enterprise systems and enterprise information exist in silos, rather than as a cohesive whole. This makes it exceedingly difficult to ensure authoritative information is available for strategic decision-making and constitutes a significant risk to the institution.

With the current structure, it is virtually impossible for the CIO to allocate technical resources according to changing institutional priorities and overall constrained resources. The approach severely limits the institution’s ability to maintain a critical mass of well-trained technical staff that can support more than a single application. The user experience suffers from an organization-focused interface design rather than a human-centred one.

We are not aware of any architectural roadmaps or interoperability standards across enterprise systems or the associated ‘feeder’ systems. There is certainly no clarity on which institutional systems are considered systems of record (the authoritative source of defined data elements) and the relationships among those systems is unclear.

Based on these observations and our knowledge of contemporary organizational models for enterprise systems at leading universities, it is clear to us that the UofS is foregoing potential scale economies given the overall size and scope of IT staff across the institution.

¹ Our description of the characteristics of enterprise systems in higher education is informed by information gathered from the Australian National University, http://information.anu.edu.au/daisy/info/services/971/973.html.
One common model of enterprise system support positions the CIO as the *technical owner* and the CIO’s peer leaders in the functional units as the *business owners* of these systems. The CIO controls end-to-end technology delivery (project management, business analysis, application support, infrastructure life-cycle, application architecture) and works in partnership with the business owner (functional needs, subject matter expertise). A predictable level of technical resources is assigned to ensure reliable service delivery (system performance and availability) and maintenance (patches, bug-fixes). Project resources are considerably more fluid and are assigned based on both local and institutional priorities and needs.

**Recommendations**

13. Vest authority for enterprise system planning, implementation, operation and support with the CIO, in partnership with identifiable business owners.

14. Consolidate enterprise systems technical staff resources within ITS.

15. Charge the Enterprise Architect (see Recommendation 10 a) with developing architectural roadmaps for the major systems, including standards and products that will ensure business agility a reasonable cost. We hope it goes without saying that these roadmaps should be developed in consultation with business owners and end-users.

16. Look for opportunities to partner with other institutions or firms in provisioning Software as a Service (SaaS) as an alternative to operating all systems locally. The SaaS could enhance service levels, would provide greater cost predictability, and should act as a mechanism to refocus management attention to innovation in other domains.

**Service Alignment**

**Service Culture**

It was clear through stakeholder interviews, the unit self-study, and discussion with ITS staff that ITS seeks to promote a service-based culture within the department and with its stakeholders. This is laudable and important, but ITS appears sometimes to fall short of its own aspirations for service management excellence. One simple but frequently cited example is the cost to install a network port: we heard figures ranging from $1,000 to $2,300. In short, no one knows, and there is no standard cost or formula to determine costs on the ITS website.

There is some uncertainty within ITS about what it actually means to be a service-based culture, what strategies and tactics would bring such a culture into being, how relationships with stakeholders might change for the better, and how ITS would measure its progress toward becoming a genuinely service based organization.

Service management challenges often beset IT departments, not only within colleges and universities, but also in any sector, public and private. To deal with these challenges the IT
industry has developed a handful of well-accepted service management frameworks. The distinguishing characteristics of these frameworks include:

- They focus on the customer’s perspective, rather than a technology-centred approach
- They can be adapted to local circumstances and implemented in response to local service management priorities.
- They focus on the quality of services (accessibility, reliability, scalability, etc.) and the interaction between technical staff and their customers.

The absence of one of these frameworks at the UofS makes it difficult to develop a coherent approach to IT service delivery and management. The ITIL\(^2\) service management framework is one of the more widely adopted in North American universities. In addition to benefiting from the lessons learned in ITIL implementations at those institutions, there is no shortage of other resource materials and professional services firms who can assist in planning and implementation.

**Recommendation**

17. The CIO should engage the appropriate campus stakeholders in planning, resourcing, and implementing an IT service management framework, with initial emphasis on the service support disciplines. The framework should be adopted throughout ITS. The standards and toolsets should be made readily available to other IT units across campus.

While we heard numerous favourable comments about specific ITS staff being very helpful and competent in assisting end users solve problems, this seems to depend largely on ‘knowing the right person to talk to’ rather than a broad culture of service excellence.

We believe this is due in part to there being no defined link or single-point-of-contact between ITS and the stakeholders to whom it provides services and support. Responsibility for relationship management with units is shared but without clear accountability. ITS could not afford to have a relationship manager for each of its key stakeholders, but it should be possible to improve communication, expectation setting and resource coordination by establishing clearly defined roles for relationship management with ‘clusters’ of stakeholders.

**Recommendations**

18. In concert with the roll-out of an IT service management framework, define the role of Service Manager within ITS and pilot its use with a cohesive set of stakeholders. The business owners of enterprise systems might be a good group to work with in this pilot.

19. Refine the Service Manager role based on experiences with the pilot, and gradually add these roles to other stakeholder groups as a continuing complement to best practices followed in the IT service management framework.

\(^2\) The term ITIL is an acronym that originally stood for “Information Technology Infrastructure Library”. However, the long name is no longer a meaningful descriptor of ITIL’s actual purpose as a leading IT service management framework. More information can be found at [http://www.itil-officialsite.com/home/home.asp](http://www.itil-officialsite.com/home/home.asp).
Standards and Service Offerings

Some of the points made in this section were addressed briefly in the IT Funding section above. However, the issues are so important that they deserve reinforcement here.

There is a worrisome absence – not lack, absence – of standards with respect to many aspects of the University’s IT environment. We heard repeatedly that departments buy equipment and software as they see fit, with the only constraint on their choice being financial. This behavior ensures that the UofS is paying more, getting less value, and increasing the internal cost of its IT operations.

Some units may see the current level of administrative autonomy as an entitlement associated with working at a university, or more perversely, as a privilege of academic freedom. We disagree, and we believe it is in the institution’s best interest to act promptly to curb the level of independent uncoordinated IT spending. By aggregating demand at the institution level within a set of standardized configurations and maintenance agreements, the University can reduce costs, increase operational capacity, liberate staff time, and reduce risks associated with IT security as described in the following section.

Software licensing is another important area of improvement that benefits from decisive coordinated action. The current funding model and independent IT spending decisions have resulted in the fragmentation of service offerings as basic as email and calendaring services. These are two foundational IT service offerings that are as necessary to the effectiveness of all employees – faculty and non-academic staff – as access to the campus network. The lack of a standard calendaring solution means that department administrators spend inordinate amounts of time each day in the simple but frustrating task of booking meetings. The cost of an enterprise email/calendaring system would be more than off-set by productivity benefits virtually everywhere at the UofS. Based on our knowledge of the current environment, the Microsoft Exchange suite of products is widely used and would be the most logical product on which to standardize. We caution the institution to avoid undue emphasis on product selection and go with one that is ‘good enough’, with final decision rights assigned to the CIO.

Similarly, other software products are not licensed by campus stakeholders due to the charge-back schemes associated with the present funding model. This further encourages departments to act in isolation. The absence of software standards manifests itself further in redundant incompatible systems that further drive up cost and risk. Many examples were cited, none more striking than the recent decision by the College of Law to build its own student system (by contracting ITS) rather than using or modifying the Banner Student Information System. We
find this bewildering, especially given that the Banner product is widely used by other law faculties and the functions that are being considered for custom development do not appear to us to serve to differentiate the UofS College of Law from its competitors, attract research investment or significantly improve the student experience.

Recommendations

20. Vest the authority for campus-wide IT standards with the CIO. Distributed IT units should be expected to adhere to established standards and should be actively consulted in the creation and development of standards.

21. Develop a plan and implement full enterprise email, calendaring and associated services for all employees of the UofS. Baseline services should not be subject to charge-backs, but end-users should also have the option to pay for enhanced services.

22. Define a more comprehensive program for software site licensing that ensures end-users have access to the productivity tools they need at a cost that is reasonable for the institution to bear.

A final observation: in several instances, particularly with academic IT, there are multiple departments providing the same or similar services. The roles and services provided by ITS, EMAP and colleges overlap with classroom support, application development and teaching/learning support. This tends to confuse both the internal department employees and the customers throughout the university. Such duplication should be resolved so that redundancy is minimized.

IT Security

There is no documented IT security framework (for infrastructure or for information) at the UofS. As noted in the ITS self-study, an Internal Audit report gave the network a failing grade on security. In our meeting with (non-ITS) IT managers, we learned that unit-level system administrators make their own policies and procedures regarding what data is shared and how it is shared. The current situation constitutes a potential unacceptably high risk to the operations and reputation of the university.

Security is a ‘negative deliverable’, meaning that the ideal outcome of IT security investments is the absence of security breaches. Given that there have been no reported significant security incidents at the University, it could be argued that the current state of IT security investment, coordination, and awareness on campus is adequate and should be sustained. It could be argued equally well that the institution has merely been lucky.

By contrast, in May 2009, UC Berkeley experienced a breach in which the private identity information of 160,000 individuals was hacked. The databases included Social Security numbers, health insurance information and non-treatment medical information, such as
immunization records and names of some of the physicians they may have seen for diagnoses or treatment. The cost to Berkeley in legal fees and reputation was enormous.

An effective IT security framework comprises everything from clarity of accountability (we believe authority for the security function must be vested with the CIO), to inventories of sensitive data locations at the institution, to standardizing operating system configurations, to pervasive use of virtual desktop technology, to patching policies and scanning to verify they are followed, to intrusion detection, to various facets of access control to IT infrastructure and data stores, and more.

Developing and managing such a framework may or may not require significantly more staff. It is difficult for us to assess the validity of ITS’s proposal to add 6 FTEs to properly manage the IT security function. It strikes us as a rather large number of people, given that security functions are currently being carried out, albeit informally, without major known breaches. However, some resources are needed to: assess risks and threats, set priorities for prevention and remediation, and determine options for allocation of staff to meet the highest priorities.

We believe there should be one full-time position within the University whose role is to plan and oversee IT security matters. That position should be a direct report to the CIO. In addition to various ITS staff involved with security functions, a clearer and more ambitious effort should be undertaken to engage qualified or trainable staff in the units. This makes IT security everyone’s business.

**Recommendations**

23. **Create a senior level role of Information Security Officer (or other appropriate title as seen fit) with full-time responsibility for IT security at the UofS. The ISO should be a direct report to the CIO.**

24. **Charge the ISO with developing an IT security framework for the campus, in concert with other IT units and key stakeholders. The framework should clearly identify the risk/benefit trade-offs that are relevant to the UofS so as to guide appropriate resource allocation.**

**Metrics and Performance**

The metrics and performance measurements available in the self-study were mostly operational; however, there are several types of performance measurements that should be implemented or enhanced at the University of Saskatchewan: operational, customer service and strategic performance.

An operational metric is one that is used to monitor an existing service in order to make a decision about replacing, enhancing or eliminating the service. For example, the measurement of hard disk storage capacity compared to utilization, the number of students using a service on
a daily basis, or the quantity of download files of questionable source are all items that can be measured in order to better manage the associated IT services. Most of the ITS measurements fall in to the operational category. The department then reacts to these measurements in planning and enhancing services. While this is a necessary and appropriate response, it should be balanced with additional attention to other performance measurements.

Customer service metrics quantify the adequacy of the ITS interaction with the University. For example, help desk utilization, time to resolve an incident or the on-time/on-budget performance of projects are all measures of customer service. Unlike the extensive operational metrics, there are few customer service metrics within ITS. As a result, ITS runs the risk of spending time and effort modifying services that customers care little about, while ignoring services that customers deem as critical or underperforming.

Measuring strategic performance is more complex, but it is the most important of the metrics. It answers the question of how ITS is contributing the advancement of the U of S mission and whether projects have been successful. If a particular college determines that the ROI for an IT project will increase the competitive advantage of the college, then the competitive advantage must be quantified and related to the IT project. For example, if a college believes that implementing a service will increase enrollment or retention, then it is important to create the appropriate IT measurements that will support this assertion. Perhaps a specific question is being asked, like will the number of admitted students increase because the college provides a unique way for students to register for classes? Through the use of benchmarking and before-and-after statistics, the enrollment improvement can be shown as a direct consequence of the project.

Metrics are used to quantify cost savings, service improvement and cost avoidance. It is important to understand which category is being used to define the metric. For example, online registration may not produce a cost savings over the paper process, but if students were required to physically be at the campus to register, it would most certainly result in a decrease of interest in attending the U of S. In this case, service improvement is the correct metric, even though expenses were increased to offer the service.

Project management metrics are of particular concern at UofS. Each project should have a justification that is submitted in a standard format for review. The document should include the problem addressed, the proposed solution, the upfront and ongoing cost and the success metrics. Once approved, this template will be used to monitor the performance of the project so that the customer can see the progress as the funds are expended. This allows both the IT and functional staff to intervene if needed or projects that are not meeting expectations.

The project management office should be responsible for collecting and providing operational and customer service measures related to project budget and human resource performance.
These measures should be distributed on a regular basis to customers and governance groups to ensure the objectives are being met. An example of a PMO report is shown in Appendix B.

Recommendations

25. Implement a set of standard performance metrics and measures that include the operational, customer service and strategic performance aspects of IT.

26. Integrate the performance measurement into the IT governance structure, project and portfolio management, IT funding, enterprise systems, service culture and IT security.

27. Develop a formal communication plan to ensure that the appropriate internal and external constituents are receiving the information and are compelled to act on the information.

ITS’s Space Challenges

The approximately 160 staff members of the ITS department are physically distributed among 22 campus buildings. This appears to be an excessive level of resource fragmentation, and almost certainly has negative effects on productivity, communication, operational effectiveness and, probably most important, staff morale. Many ITS staff expressed the view that the institution simply “doesn’t care”, and observed that ITS’s space situation is unlike any other organizational unit in the University.

We are not in a position to make specific recommendations on how to provide better space for ITS, but it seems crucial to us that the University address the issue.
Appendix A
Designing a Governance Model

A summary of the governance model for administrative IT services at the University of Illinois is provided here to promote discussion and comparison to UofS. Like all universities, the University of Illinois continues to evolve its process for prioritizing administrative information technology projects, and what is presented here is the current configuration of the governance practice. This process, known as the Information Technology Priorities Committee, has been used as a model for Educause presentations, and is the foundation for a governance workshop for Educause 2010.

The model begins by asking a specific question, “How should we approve and prioritize administrative IT projects?” In Figure A.1, the complexity of this question is demonstrated by showing various paths that an idea might take to become an approved project. The diagram recognizes that there might be multiple governance groups or committees that approve projects, and these groups or committees may or may not be connected to each other in a formal way. Additionally, there are often “super important ideas” that may not follow the approved governance model and may be driven by an executive priority or a change in the external environment. In either case, the governance process must be tolerant of these ideas, but not promote them as part of the normal process. The goal of designing a governance model is to clarify the process so that the University knows how projects are approved and prioritized.

![Figure A.1](image_url)

Figure A.1- Diagram showing the complexity of the IT decision-making process at a university.
Shown near the centre of the diagram is the U of Illinois “ITPC” process, which is the Information Technology Priorities Committee. It was put in place in 2004 and it has been used to approve and prioritize administrative IT project since then. The basis of the ITPC process is a hierarchy of committees that was designed to create involvement at all levels of the organization. As shown in Figure A.2, the foundation of the process is the use of three subcommittees from the main functional areas in administrative IT, that is, student services, finance and human resources. These committees consist mostly of manager and director level employees that work in the student, finance and HR offices. They meet regularly to discuss changes to the enterprise systems, and they have the authority to approve projects that do not require additional funding, that is, projects that use only existing resources within the IT department. For projects that require additional funding, or more than 850 hours of IT work, the committees create proposals that describe the issue, the resources required the address the issue and the return on investment. The committee also prioritizes their own proposals from the most important to the least important.

The proposals from the subcommittees are then discussed, approved or denied and prioritized by the cross functional group and the main ITPC committee. The membership of the main ITPC committee includes functional and IT representatives, and they are generally at the director or assistant/associate vice president/provost level. This group is responsible for prioritizing across the functional boundaries, and the majority of the IT project resource allocations are discussed in detail within this group. The group produces an annual report of their activities.

Finally, for very large projects, the ITPC makes recommendations to the Academic Affairs Management Team, or AAMT. This group has some similarity to the University of Saskatchewan PCIP. The AAMT spends little time on reviewing IT projects, and relies heavily on the ITPC for recommendations.
Figure A.2 – Example governance structure for administrative IT projects.

Extending this model further, Figure A.3 shows an integrated IT governance model for a university system. The drawing demonstrates the components of an interrelated governance process that allows for decisions to be made and resources allocated. Figure A.3 relates directly to discussion of the governance framework with the body of this report, and the terms described in the report are represented in the drawing.

Although the diagram is complex and may appear overwhelming to implement, not all of the features need to be included in a good IT governance model. The purpose of the diagram is to show how the elements relate to each other and not necessarily be prescriptive in creating a governance model. If the model is used, the most important items are:

• Assign the authority for the resource pools of funding and staff shown in the green diamonds.
• Assign the responsibly for decision making shown in the red diamonds.
• Create topical IT committees that help answer specific questions, for example “who decides what the learning management system should do?” or “what consolidated resources do we need for high performance computing?”
• Determine the interrelationships between the committees so that it is clear which committees are advisory and which committees have responsibility and accountability.
• Designate ultimate responsibility for shepherding the IT governance model.
Figure A.3- Diagram showing an integrated IT governance model for a university system.
Appendix B
Creating Performance Measures

One task of the governance group is to decide on the performance measures for IT. These measures should not be overly complex and there should not be too many of them. The performance measures will change over time, but it is important to establish the baseline metrics so that the data can be collected immediately.

In some cases, the underlying data may not be available, or the data may have too many inconsistencies to make meaningful conclusions about performance. If the data are not readily available, then policies should be created to collect the data. For example, if IT spending at the department level is an important measurement, and departments use different terminology to describe their IT personnel and IT equipment purchases, then standards should be created so that the data are consistent moving forward.

One area of particular focus should be project management. By creating a set of measures for the performance of IT work, both ITS and the university at large can see how resources are allocated and how work is progressing. An example of effort allocation is shown in Figure B.1. In the chart on the left in Figure B.1, the total FTE for the central IT department (AITS in this case) has been broken down by function. Each of the slices within the pie chart has the complete work history at the employee level, so the data can be examined in more detail. In the chart on the right, the two slices for new project work are broken into their components. In this case, it can be seen that three projects are dominating the work load (Global Campus, HR Front-end and Banner 8.x), while only 18% of the time is being spent on all of the rest of the smaller projects (about 30 per year). A conclusion can be made that the department needs to finish the HR Front-end (52%) soon or stop working on it.

Figure B.1- Distribution of IT FTE by function and project
Not all IT work is considered a “project”, and Figure B.2 shows the breakdown of smaller units of work, called “work requests”. A work request is similar to a project, but it consumes less than 250 hours of work to complete it and does not require rigorous project management. The bar chart on the left shows the hours per request for the past four years. It can be seen the average time for completion is relatively constant between 30 and 35 hours. The charts on the right show the distribution of work requests by department. In these charts, the student and HR work is dominant and accounts for 76% of the items and 72% of the hours. With these data, the governance groups can decide if the university priorities are being met with this distribution or if changes in work distribution should be made.

**Figure B.2**- Average hours per work request and distribution of work request by function.

While the previous figures measured the distribution of work, Figure B.3 measures the effectiveness. The schedule and budget performance for all IT projects is measured in detail, and Figure B.3 shows that the percentage of projects that were significantly over budget has been decreasing steadily for the past two years. At the individual project level, there is additional data that shows why projects are not performing as expected so that corrective action can be taken.

**Figure B.3**- Historical schedule and performance summary for IT projects.