To: To University Community
From: Robert Cook, CIO
Date: May 12, 2010

Re: Report #2 and Recommendations, Student e-Communications Services

In my February 26th, 2010 *Response* to the initial *Report from the CIO's Consultation on Student e-Communications Services*, I outlined further activities the University needed to undertake to evaluate the viability of an outsourced solution to meet the needs for student email services.

I wish to report the outcomes of those investigations and recommend further action that would permit the University to make a decision by June 30th, 2010 with regard to outsourcing student email.

Actions recommended and taken, February 28th – April 30, 2010

1. **Continue community consultation**
   a. Students
      i. Student members of the initial consultation committee have responded supportively to the actions called for in the CIO *Response*.
      ii. The feedback form on the I+TS website continues to be available for input from students.
      iii. Members of the Committee on Student Services have received the Report and Response.
      iv. All student members of Governing Council were invited to assist the CIO in establishment of an ongoing CIO Student Forum.
      v. Student representatives participated in divisional meetings at UTM and Applied Science & Engineering.

      Messages received in these fora have aligned with the concerns, issues and aspiration for improved service voiced by the students in the initial consultation committee. No new issues have surfaced. Efforts continue to further engage students in consideration of this idea.

   b. Faculty and staff
      i. Teaching Learning and Technology Advisory Committee
      ii. Arts & Science Committee on Teaching & Learning
      iii. Applied Science & Engineering Teaching Methods and Resources Committee
      iv. Divisional registrars
      A number of specialized communications requirements were identified (e.g. group mailing by shared attributes) by this latter group, but they are likely more affected by the functionality of Next Generation Student Information Services (NGSIS) than the email service itself. Desire was expressed for advanced functionality such as confirmation of email delivery. Requirements for retention of official communications were also raised.

More generally, the concerns raised in faculty and staff consultation continue to focus on issues of trans-border information flow and intellectual property ownership.

c. Advisory committees
    i. I+TS Process & Technology Committee
    ii. I+TS Priorities & Accountability Committee
    iii. Provost's Advisory Group

The advisory committees have generally been supportive of investigating outsourcing options. Email is critical to institutional communications with students, but must increasingly be understood as just part of our overall communications strategy. Continuity of the University brand within the email domain has been affirmed as critical. The opportunity to distinguish student accounts from staff and faculty by incorporating a unique designator within the domain name was discussed and deemed desirable. Such designation would result in three domains for the institutional email offering: for example, @utoronto.ca for staff and faculty; @student.utoronto.ca for students; @alumni.utoronto.ca for former students. An opportunity whereby students not wishing to have their email processed by an outsource provider could opt out was viewed as desirable. The PAC expressed clear desire to be consulted before any public Request is issued.

d. Campus focus groups
    i. UTM Computing Committee
    ii. UTSC
    No specific focus group was held at UTSC, but UTSC community members participated in many of the above consultations.

Members of the east and west campus communities raised the same issues as other groupings. No campus-specific issues have been identified.

e. Other consultation
    i. Divisional, campus, college and departmental IT managers
    ii. Sub group representation from distributed IT staff

The principal concerns of technologists were again around data privacy, security, services integration and functionality for institutional investigations. Sub-domains and distributed management were requested. Some argued that operating multiple distributed email services provides opportunity for innovation and development of solutions that target the specific academic needs of departments. I+TS argued that the Next Generation Student Information Services (NGSIS) project would be a more likely driver for innovation. The potential for realizing savings at the local budgetary level may drive subscription to the institutional solution. The assumption that savings can be achieved through outsourcing was also challenged by some technologists: end-user support will still be required. I+TS has suggested the standardized interface of outsourced providers and extensive online support tools may reduce in-house support requirements.

With minor exception, the extended community consultation in March and April did not reveal concerns beyond those raised during the work of the initial consultation committee. Requirements with regard to security, privacy, improved functionality and quotas, ease of use, and transition to alumni status, were consistently raised.

2. **Analyze Privacy Issues**
Our Director of Information Security worked with the University's FIPP Office to identify privacy requirements for an outsourced email solution. Key privacy issues that must be addressed by suppliers wishing to provide services to the University of Toronto include:

1. Ensuring that the service does not contravene: University legal responsibilities, including FIPPA privacy requirements; University policies, operational guidelines and established practices; stakeholder privacy expectations, including students, staff and faculty.

2. Loss of University control of information kept on external contractor resources, including: risk of interception, hacking, unauthorized uses, or criminal activity; risk of data loss or destruction; risk due to differing/incompatible technical and/or operational standards; risk from primary contractor or subcontractor actions.

3. Legal risks of information storage outside Canada, including: foreign law, including civil action and U.S. PATRIOT secret warrants; and difficulty enforcing contractual obligations outside of Canada.

4. Increased risk from changes in user behaviour, including: availability of unprotected or low-security service options; offsite storage of very sensitive information / large volumes of data.

Information Security has established the framework for a Privacy Impact Assessment that will be extended as details of potential service arrangements for outsourced email become available. In addition to identifying privacy risk, the PIA will suggest strategies to mitigate or limit that risk.

3. **Analyze peer outsourcing models and experience**
    a. University of Alberta
       The experience of the University Alberta is perhaps most applicable to our situation. UA has announced its intent to outsource all email services --student, faculty and staff -- to Google. Governance approval has been received; a Privacy Impact Assessment has been accepted by the Alberta Privacy Commissioner; and the only remaining hurdle is agreement by Google to a contract that accommodates the requirements of the Canadian university context. While UA has reported that it anticipates annual savings of about $1.2M, it is important to note the differences to our circumstance:
       i. U of T is contemplating an outsourced solution only for students, and must bear the cost of maintaining staff and faculty services in-house.
       ii. UA will shut down all distributed email services in favour of Google.

    b. Lakehead University
       Lakehead has been using Google for faculty, staff and student email since 2007. However, it is operating under the standard contract designed for US educational institutions, with no adaptation for the Canadian context. It is also unclear the extent to which Lakehead conducted a Privacy Impact Assessment.

c. Humber College

Humber has been providing Google Apps service for students since 2007. We understand that there is no institutional contract in place.

d. US peers (Washington, Arizona State, USC)

Colleagues at USC, ASU, and U Washington shared many details of their experience with Google:

- Few uptime issues; if there is downtime, people seem to understand and accept more readily than when local systems go down
- Students self-migrate and adopt services readily
- "Students thrilled!" -- Kari Barlow, AVP University Technology Office, ASU
- "Our experience has been positive. Each of the moves [they have other outsourcing arrangements as well] has decreased our costs, improved our reliability, and made our services more predictable. This is a core element of out information technology strategy, and it has accelerated our advancement." Dr. Adrian Sannier, VP and University Technology Office, ASU
- Quota issues gone.
- All Google Apps are available.
- USC annual IT survey for students has had Google Apps as the favorite service since it was introduced.

e. alumni.utoronto.ca

The Division of University Advancement has offered alumni accounts in partnership with Google for some years. They report:

- Alumni experience has been good. Alumni respond well to the offer.
- Close to 15,000 active accounts although more are on the system.
- Of affinity services, Google Mail is most popular, helping drive alumni to other offerings and communities.
- Graduating students are eager to take advantage of service. They appreciate the storage and the service levels. They have not experienced problems with email forwarding as with other services.

Moving forward, it will be important to standardize the process by which students can migrate to the alumni system.

4. **Technical Analysis**

a. Security and identity management

Security risks associated with outsourcing email services were reviewed by our Director of Information Security in a Threat/Risk analysis. He reports that to minimize risk to the University, information must be effectively and reliably protected while in storage, administration, use or transport. Potential email and web-service solutions must be evaluated to ensure that they verifiably protect the requirements of: confidentiality, integrity, availability and accountability for use of information entrusted to the service.

It is the University's expectation that these requirements can be met through a variety of practical strategies, the implementation of which will vary depending on the technology used by the outsourced service provider, and the effectiveness of which must be confirmed by periodic external audit. These strategies include: identity management, access and permission controls, change and vulnerability management, business continuity and disaster recovery management, redundancy and capacity management, and management and control monitoring and

verification. An assessment of the security provisions of a specific solution will be developed as part of its evaluation.

b. Technical architecture, network and system management requirements
   Consultation with peers that have implemented outsourced email solutions suggests that any impact on our network would be minimal.
   I+TS staff have investigated a number of models for processing email in an outsourced arrangement. The three most likely options are documented in the attached Appendix 1. Variation relates to what systems would handle which portion of the University's mail; what systems would bear responsibility for processing inbound mail for anti-spam and anti-virus (with the associated costs); and how the mail of users who opt out of the institutional solution would be processed.

5. **Cost analysis**
   a. Cost of current U of T email solutions
      There are two components in estimating the cost of providing our current email solutions. First is the institutional offering, UTORmail. As it provides service to staff and faculty as well as students, the demonstrated costs should not be attributed solely to student email.

   Annual Operating Cost for UTORmail System

Anti-spam/Anti-virus Software Licensing	$83,250	
Hardware Maintenance	$32,174	
Backups	$80,000	
Power and Cooling	$80,000	
Expansion of server environment to accommodate growth and capacity for new users	$45,475	
Replacements costs for end of life servers	$67,575	
Total non-personnel		$388,474
Staffing*	$250,000	
Total personnel		$250,000
Total Costs:		**$638,474**

   *Note: staffing costs do not include UTM, UTSC, Scotiabank Information
   Commons, or divisional support for local users of the central system.

   The second component resides in the 159 distributed email systems operated by divisions, departments and centres across the University. Again, these serve communities that include faculty, staff and students, so we cannot distinguish the portion directly attributable to student email. A survey distributed through PDAD&C generated data related to 19 systems, including major divisional systems operated by Medicine and Rotman. Responses showed that $590K is spent annually in supporting these systems that have an estimated replacement cost of $868K.

   A conservative algorithm was used to project the total annual cost (equipment and personnel) of operating all 159 of the distributed email systems to which central services route email

arriving at utoronto.ca.   Estimated operating costs of $1.15M and annualized equipment renewal costs of $.29M suggest that up to $1.44M is spent per year to run these systems.

There may well continue to be academic reasons to sustain the operation of distributed email systems – but as more feature-rich institutional offerings are established, these figures suggest the potential for cost saving in the delivery of email that could be redirected to activities more core to the University's mission.

b. Costs associated with outsourcing
Appendix 1 provides high level annual costing of the different alternatives for processing outsourced student email.

This analysis makes clear that the value that could be achieved through outsourcing email is not from immediate cost savings (although there is potential for some cost reduction depending on the technical architecture adopted); value, rather, will be achieved in the dramatic increase in e-communications service functionality made available to our students. The potential for longer term cost saving will be achieved only with the elimination of UTORmail, through resolution of the faculty/staff email question.

6. **Exploratory discussion with outsourced vendors**
Initial conversations were held with Microsoft with respect to its education offering, Live@edu and with Google regarding its Apps for Education. These services are co-branded and free for students, employees and alumni of the contracting university.   Email addresses would have the domain utoronto.ca. Subdomains are supported. Data are stored on severs around the world including the US. The services include:
- E-mail and calendaring
- Integrated to-do/task lists
- Instant messaging
- Groups for collaboration
- Shared document editing capabilities
- Blogs
- Translation tools (Google)
- Integrated maps
- Personal web site creation, templates
- Multi-GB storage space
- Personalized, customizable "home" space with widget integration
- Common interface that permits access to the collection of services with a single sign-on.
- Access to constant innovation of thousands of developers
- Opportunity to create new services via developer toolkit
- Secure, backed up facility with very high continuity capacity

These services are different from their consumer or commercial offerings: the contractual relationship is with the institution, the services carry no advertising and data are not mined.

7. **Preliminary legal consultation**
Initial consultation suggests that a negotiated contract with the service provider can offer protection to both the University, and individual account holders, greater than that enjoyed by our students in their personal agreements with cloud providers. Necessary issues to cover in a contract include privacy,

security, audit rights, service levels, exit procedures, discovery rights, compliance, support levels, and the credentialing process.

8. **Policy, Guideline and practice implications of outsourcing**
   The following issues have been identified:
   a. The Policy on Official Correspondence with Students requires students to have email accounts with "official" UofT email services. An outsourced solution carrying the University domain and authorized and provided by the University meets the policy criteria.
   b. E-mail services must meet standards as defined by the VP and Provost, or delegate. A contract with an external vendor would have to meet provostial requirements.
   c. Data security is elemental to this process. Upcoming new policy and guidelines for the management of information security will address the requirements for any outsourcing provider.
   d. Informing and educating the community as to the appropriate use of the e-mail service, as well as to any functions that will differ from current services, will be incorporated into the project. Other universities adopting outsourced solutions have experienced significant reduction in help desk requests as students are already familiar with these such Web-based services.

9. **Communications, migration and user-support requirements**
   I+TS has started development of an end-user communications plan that will include a website with project information and FAQ. Preliminary consideration has been given to migration of existing student users and support requirements. These would be more fully developed in the context of provider resources.

10. **Functional requirements of an outsourced solution**
    The minimal functional requirements of an outsourced solution are being developed in anticipation of issuing a Request for Information from potential suppliers. These include (but are not limited to):
    - Service to carry no advertising
    - Supplier to recognize ownership of data and not mine data for their business purposes
    - Supplier recognizes that the University owns all data in the email service pertaining to the University
    - Supplier will provide discovery tools permitting distributed University administrators access e-mail transactions for disciplinary or administrative purposes.
    - Supplier will have a privacy policy consistent with the University and Canadian law
    - Supplier's service must meet the University's new standards for security
    - The selected supplier will provide the results of external audits of their security practices
    - The University must be able to provide e-mail accounts with the University's top-level domain, utoronto.ca. Sub-domain capabilities, e.g, student.utoronto.ca or law.utoronto.ca are required.
    - The selected supplier must have online support tools for end-users via multiple vehicles such as instructional Web pages, video snippets, new release documentation. A 24/7 help desk service is required.
    - The supplier solution will be based on published standards and be functional on a wide variety of platforms and devices.
    - The supplier solution must be able to interoperate with the forthcoming NGSIS reference architecture.

As noted in the *Response* document, the University must also consider the future migration of those employees still using UTORmail. While the current study and recommendations are exclusively focused on student e-

communications services, I+TS is archiving information that may be relevant to future consideration of the viability of such outsourced solutions for employee e-mail.   It is also considering the implications should faculty and staff wish to use the outsourced solution, should one be adopted for students.

Recommendations

1. **That the University immediately develop and release a Request for Information (RFI) soliciting information from the supplier community on free outsourced options.**
   Procurement Services advises that even though the University is seeking a "no-cost" service, association with the University in such a venture may be deemed to have non-financial value to the provisioning entity. Providing a public opportunity to the supplier community to respond would be consistent with the University's commitment to fair and transparent procurement practices. Any subsequent decision to partner with a provider would also be publically announced.
   The next step in proceeding to RFI will be to define the minimum requirements of an outsourced service. (See Timetable below.)

2. **That the CIO bring a specific recommendation with regard to outsourcing student email to the Principals & Deans meeting of June 24, 2010.**
   The recommendation would specify any conditions to be met before implementation, including user advisories and achievement of a supplier contract satisfactory to the University with respect to privacy protection, security standards, service levels, discovery rights, support levels, data ownership, etc.
   The Timetable below outlines preliminary consultation on a draft of the recommendation with a number of bodies.

3. **That the University assign the institutional email accounts of students to a student designated domain, e.g. @student.utoronto.ca**
   This recommendation is actually separate from the question of outsourcing. The intent of this change is to reduce the not uncommon occurrence of correspondence being inappropriately directed to a student email account rather than an employee account. For consistency, it is also recommended that any divisional email systems adopt the student designator within their subdomain.
   Pending decision about outsourcing, this domain would resolve to UTORmail; but introduction of this new domain now would facilitate migration to an outsourced solution should that decision be made at a later date.
   Students with existing UTORmail accounts would continue to receive mail at their current @utoronto.ca account as well as, in our example, @student.utoronto.ca. Their outgoing mail would be identified with the @student.utoronto.ca address. There would be no action required by current account holders to affect this change. At some future date, the domain @utoronto.ca would be deactivated for student accounts.
   Newly admitted students would be issued with only the new @student.utoronto.ca address.
   Staff or faculty with UTORmail or UTORExchange accounts who are also students would be issued a second account with the domain @student.utoronto.ca to manage correspondence related to their student role. Forwarding to their @toronto.ca account would be permitted, but not vice versa.
   Students who concurrently become employees of the University and require an email account to conduct University business would be issued with an @utoronto.ca account for the duration of their employment.

Timetable

May 5	Draft report #2 and the recommendation to move to RFI stage to be reviewed by I+TS Priorities & Accountability Committee.
May 6	Report to Principals & Deans meeting
May 7 – June 7	Additional community consultation, especially with student community
May 7 - 16	Establish minimum requirements for an outsourced solution
May 17	Publish RFI, with responses required by May 31
	Concurrently continue the evaluation of Google and Microsoft offerings
May 20	Update to PDAD&C
June 1	Consider responses to RFI
June 7	Draft recommendation of outsourced supplier and conditions to be met
June 7	Update to Provost's Advisory Group
June 10	Take draft conditional recommendation to I+TS Process & Technology Committee
June TBA	Consideration by I+TS Priorities & Accountability Committee
June 21	Take draft conditional recommendation to Provost Advisory Group
June 24	Conditional supplier recommendation brought to P&D

	Provisioning options for handling outsourced student email		
	1. U of T receives all email and directs to appropriate email provider, as in current configuration	2. All email for U of T is first directed to the cloud, and if a name match is not found, is forwarded to U of T	3. Student email is received directly by cloud, faculty and staff email is directed to U of T as current
Description	U of T provisions students with a name@student.utoronto.ca email address and when a message is received, it is received at U of T and directed to the appropriate mail provider	U of T provisions students with a name@student.utoronto.ca email address, but all mail for anyone@*.utoronto.ca is processed first by the cloud provider, and if no match is found, is forwarded to U of T for local delivery or redirection	U of T provisions students with a name@student.utoronto.ca email address. All email for students is directed to the cloud provider while faculty and staff email is handled as it is at present
Approximate annual cost of hardware and software	$154,000.00	$22,000.00	$98,000.00
Benefits	- Provides the most flexibility of cloud sourcing - Only need to locally store messages for faculty and staff - Service could be expanded to provide alias hosting for name@dept.utoronto.ca - Easiest exit strategy - Easy opt-out/in strategy for individual users	- No requirement for U of T to perform spam or virus filtering - Lowest cost option - Greatly reduces hardware and software requirement at U of T	- Greatly reduced email load on U of T servers - Similar to current offering of alumni office for branded name@alumni.utoronto.ca service - Service could be expanded to provide alias hosting for name@dept.utoronto.ca
Drawbacks	- Highest cost solution - Just eliminates storage cost - Must still filter spam and viruses of all incoming mail - Campus email system processes the same volume of email as present - Costs do not include the message system for approximately 27,000 faculty and staff currently on UTORmail system	- Requires multiple domains hosted by cloud provider - May only be possible with Google - All messages for all faculty and staff flow first to the cloud provider, then to U of T - Opt out provision may require additional hardware and costs - Costs do not include message system for approximately 27,000 faculty and staff currently on UTORmail system	- Difficult to provision more than one cloud provider - All email for students flows first to cloud provider - Opt out provision may require additional hardware and costs - Costs do not include the message system for approximately 27,000 faculty and staff on UTORmail system - Students forwarding email would still have cloud as first stop