

Faculty Senate Information Technology Ad hoc Committee Annual Report

August 2015-May 2016

Co-Chairs (Fall): Subra Bulusu and John Grego

Chair (Spring): John Grego

The Faculty Senate IT ad hoc committee was formed in January 2015. The committee continued its biweekly meetings in AY 2016, and hosted the Symposium on Research Computing Infrastructure on April 15, 2016. The committee is comprised of six faculty members, a graduate student representative, an undergraduate student representative, and six ex officio members. The chair of the committee serves on the Faculty Senate Steering Committee.

At the April 28, 2015 general faculty meeting, faculty voted favorably for the Faculty Senate Information Technology Committee proposal drafted by the ad hoc committee. The proposal was not approved and eventually returned to the Provost for changes. The standing committee proposal was again approved at the April 26, 2016 General Faculty Meeting and awaits approval by the administration and the Board of Trustees. If approved, the standing committee will supersede the ad hoc committee in Fall 2016.

Meetings, invited guests and topics:

8/24/2015 Initial meeting of AY 2015-2016. Mr. Todd McSwain, Director of Network Services and Executive Director of Communication Infrastructure, visited and discussed the recent WiFi upgrades in classrooms, planned WiFi upgrades in Thomas Cooper Library, Russell House and student dorms, and plans to implement eduroam. A High Performance Computing (HPC) white paper will be shared with the Provost. The UTS inventory of classroom technology was completed during the summer.

8/31/2015 Issues with WiFi were discussed; eduroam was briefly discussed. The committee discussed the Banner ticketing system being developed by Prof. Juan Caicedo, and Aaron Marterer provided an update on Banner improvements.

9/14/2015 James Perry, Chief Information Security Officer, and John Sturgis, Security Program Consultant, discussed cybersecurity, including responsibilities of the University Information Security Office, the role of unit security liaisons, and new security standards mandated by the state of SC. New security tools post-SecureCarolina were discussed, including Data Loss Prevention security software. Eduroam will be activated shortly. News of the addition of line items to USC's budget for HPC was shared.

9/28/2015 Prof. Juan Caicedo, Civil and Environmental Engineering, discussed the Banner Ticketing System. The ticketing system he developed is now functional; he is

working with UTS and the Provost to hand off the system to UTS, who must arrange with the Provost for the work to be done. Banner implementation in general was discussed. An HPC workshop was proposed.

10/26/2015. Vice Provost and Director of Academic Planning Harry Ploehn discussed PeopleSoft training for Faculty PIs. Randy Shelly, Executive Director of Managed Services at UTS, discussed the Banner ticketing system hand-off, funding is not yet finalized. Questions about the existing ticketing system were discussed with Aaron Marterer. Phil Moore prepared a new quote for a system-wide Matlab license; Matlab and other software will be discussed at the 11/9 meeting. Phil Moore has been negotiating with Dell on a HPC; storage space at UTS will be shared with RCI for faculty research computing.

11/9/2015. Michael Cathcart, Manager of UTS Web Services, and IT officers from several units were invited to discuss software licensing. Negotiations for Adobe Creative Cloud/Adobe Acrobat Pro were discussed; Adobe is now much less flexible in its licensing options. Current demand for Adobe Acrobat Pro and Creative Cloud was assessed on a unit-by-unit basis. Matlab licenses were reviewed on a unit-by-unit basis; cost-sharing models for a system-wide license will be explored. Other software needs were discussed.

11/23/2015. Provost Joan Gabel visited the committee and announced plans to appoint a Blue Ribbon Committee to study HPC/Data needs, including the IT committee's white paper. Budgeting was discussed. Data storage options were discussed. The committee requested support for Matlab and Adobe Creative Cloud suite licenses. Other topics included classroom technology, a center for academic computing, and IBM. The committee will create a HPC/Data survey, based on an earlier 2007 survey.

12/7/2015. Stan Lawrimore and Michael Fenn from UTS Data Center Services were invited guests. Important announcements included Subra Bulusu's resignation, CIO Bill Hogue's resignation, and the return of the standing committee proposal to the Provost. The committee discussed the recurring and non-recurring budget lines for HPC; concern was expressed over the \$500K taken from HPC investment for retroactive Banner expenses. The HPC workshop will be planned for Spring 2016. Recent improvements in administrative storage were discussed, as well as a need for better coordination of research and administrative storage needs, better internal capacity for transferring data, and inexpensive long-term storage options.

1/11/2016. The committee reviewed topics from last semester and developed an agenda for Spring 2016. PeopleSoft training had not gone well; work is proceeding on the Banner ticketing system; Aaron Marterer put forward a proposal to reactivate the Banner portal. There were concerns about progress on the HPC white paper and the committee proposed drafting a letter to the Provost. The survey and workshop were discussed. USC's current costs for Matlab licenses were updated to include student licenses.

1/25/2016. The committee discussed classroom technology based on our white paper proposal for tiered classrooms. We agreed to schedule a presentation on Ensemble for online classes. The committee's letter to the Provost was delayed by the hiring of Accenture to review USC's IT needs. Content and distribution of the HPC/Data survey was discussed. The HPC/Data workshop was scheduled for April 15. Research data repositories were briefly discussed.

2/8/2016. Jeff Hostilo, Director of Teaching and Technology Services at UTS, shared a comprehensive spreadsheet inventory of classroom technology; other classroom technology issues were discussed. Plans to request support for a system-wide MatLab license are underway. Randy Shelly from UTS reported on the Banner ticketing system; there were unresolved issues with respect to the proposed workflow. Proposed alternatives to Adobe Acrobat Pro were discussed, but need to be researched further.

2/22/2016. John Cendron, Cheng Zhang and Mark Barajas (via phone) from Accenture were invited guests. Accenture sought committee opinion on UTS (UTS was not present at this meeting). UTS strengths (WiFi implementation, distance education, EduRoam implementation, student technology fees) and weaknesses (numerous issues appearing in this and the 2015 committee report) were discussed. Questions posed to Accenture addressed ERP implementation and IBM.

3/21/2016. Jeff Farnham made a presentation on IBM's Center for Applied Innovation; the committee discussed constructive ways to engage IBM on research projects. IBM's progress on applications support was summarized. Todd McSwain from UTS updated the committee on WiFi; improvements to residence halls, Russell House and Thomas Cooper Library are scheduled for July completion. Other potential projects were discussed.

4/4/2016. The committee will be represented on the CIO search committee. Requested changes to the standing committee's bulletin entry were discussed. The HPC survey was nearing completion for distribution to 700 faculty. Invited guest Jeff Hostilo reported on classroom technology. Discussion topics include the appropriate distribution of technology tiers. Michele Branch-Frappier from UTS was invited to discuss Ensemble. The proposed system, Academic Media Portal, will greatly reduce human intervention. UTS plans to make the system available for its distance courses and would like to offer the system as an enterprise solution to other units.

4/18/2016. The committee discussed the April 15 symposium, including the Provost's encouraging comments on additional investment in HPC/Data. A cost-recovery model for a systemwide Matlab license still has not been established. Our committee will meet with the Faculty Budget Committee to discuss concerns with PeopleSoft. Aaron Marterer discussed his draft proposal for a Banner portal; because of the peculiarities of the USC system, a satisfactory portal may not be possible to develop. James Perry, Chief Information Security Officer, and John Sturgis, Security

Program Coordinator, were invited guests. New initiatives were presented, including Identify Finder, website improvements, IT 3.00 update, security liaisons and minimum security standards.

5/2/2016. Mike Kelly, Chief Data Officer, Stan Lawrimore, Executive Director of Data Center Services for UTS and Ron Scherba (UTS) were invited guests. Aaron Marterer reviewed the 2016 roadmap for Banner improvements. Mike Kelly discussed a new data governance framework and other efforts. Faculty research data had been deliberately firewalled, but committee members encouraged him to consider otherwise; he has already made plans to meet with the Vice President of Research. The committee agreed to draft a summary memorandum about the research symposium and share it with deans and administrators. There were few data storage improvements to report. UTS could not develop a feasible charge-back model for Matlab; it will approach units individually for contributions, seek support from the Provost, and develop a subsidized charge-back model instead.

1. WiFi upgrade:

In 2015, UTS planned to upgrade WiFi in 19 large lecture classrooms, with 40-45 clients/AP instead to reduce noise/interference; each room presented unique challenges, including retention of omnidirectional APs in some rooms, difficulty in mounting directional APs in other rooms, and switch upgrades in others. The old AP's (140 of them) at the Close-Hipp building are still there with 10Gb uplink switches; they are relatively up to date; 10-11 media classrooms had already been upgraded in Close-Hipp.

The second phase includes eight dorms, the Russell House and Thomas Cooper Library; this is a "true sponsored project" (organized by the Project Management Office). The project has a budget of \$1.5M to include switches, single mode fiber with 10Gb capacity to buildings. Phase one remediation of the large lecture halls is complete and phase two, focusing on the residence halls, Capstone, Russell House, and TCL is on track for July 2016 completion. There will be less a formal "phase three" than an ongoing effort to provide upgrades as needed.

UTS created EntertainNet to pull uscguest from dorms and replace it with unencrypted access for games and ROKU. P2P and BitTorrent have been disabled from uscguest.

Eduroam is the global WiFi encrypted network offered through Internet2 that is popular with traveling university faculty. Based on faculty requests, USC planned how to engage with eduroam and then activated Eduroam after a committee mandate.

Recommendations:

- Further switch upgrades to 10Gb when possible.

- Students should be encouraged to turn off Bluetooth devices during lectures, though committee members were unsure students would know what to disable.
- Awareness of eduroam was low among the academic community; UTS may consider promoting it as a more secure guest connection.
- Individual committee members advocated WiFi improvements in the Humanities Classroom Building and Darla Moore School of Business. Capacity at new buildings is sometimes constrained by competing budget issues.
- UTS could provide better feedback and communication about outages. With this information, we could ask students during class to drop clients that were using IP addresses.
- Faculty and student committee members noted that reasons for moving toward Edutainment were unclear and could be better communicated to prevent rumors circulating.

2. Research Computing and Data Curation

The administration added a line item budget item under the Provost's FY 2016 budget for Research Cyberinfrastructure (RCI), including \$1M for recurring costs and \$750K in non-recurring costs; \$500K in recurring costs were removed in FY 2016 to pay for retroactive Banner implementation costs. The committee expressed concern that recurring funds for HPC and data could be raided in future years.

Phil Moore negotiated with Dell on a high-performance computer in Fall 2015 and prepared a \$750K proposal for a cluster with 2000 cores. He surveyed SEC schools and found a range of 1500-30,000 cores; we were lowest in the SEC. The \$750K in non-recurring funding is dedicated to high performance computing; we need funding for data storage as well, but it's not clear if it's in the FY16 budget. The committee felt that high performance computing solutions are relatively straightforward, while data curation solutions are more complex.

Provost Gabel planned to appoint an advisory committee to review the committee's white paper recommendation given in part the expense and the riskiness of tech investments. Formation of the committee was delayed by the hiring of Accenture to assess UTS, but was re-organized in May with Dean Hossein Haj-Hariri as chair.

VMAX is being replaced by XTremIO and Isilon to store administrative data. XTremIO has 180TB of Tier 0 and Tier 1 storage. Some VMAX functions have already migrated. LT0-3 tape drives storing administrative data were upgraded to LT0-6. An estimate of \$500K/5 PB was provided for a tape-based archival system. Phil talked with UTS to carve out 2TB of storage for research purposes from UTS's Isilon machine (140 TB capacity) with 10Gb connectivity. RCI is UTS's first external customer.

The committee drafted a HPC survey 2007 survey; it will target faculty who have submitted external grants in last 5 years and will be distributed in May 2016.

The HPC/Data workshop proposed by Subra Bulusu to demonstrate faculty needs was held April 15, 2016 with support from the VPR, IBM and SRNL; the workshop was coordinated by Phil Moore and Bob Brookshire. The program included external speakers, faculty presentations, student posters and a faculty panel discussion. At the meeting, the Provost indicated that USC should move quickly to median expenditures/cores in the SEC, which would require a larger investment than is currently listed in the budget. A summary memo of the workshop was shared with selected administrators and all academic deans.

Subra then shared NSF/NSA policies on back-up and research computing, which place these responsibilities squarely on the campus as part of expected research infrastructure.

Phil guessed that current researchers would need 100TB storage and 100TB of fast (Infiniband) storage; a single hire could upset this answer.

Recommendations:

- The university continues to need a cost-effective solution for long-term data storage and curation. Research data storage currently lacks a systemwide-strategy.
- The committee should take steps to ensure that future allocations will not be diverted from High Performance Computing and Data Storage.
- The committee's \$750K HPC proposal should have been acted on in AY 2016. Though developing a long-term strategy is necessary, the Accenture study and the appointment of the Blue Ribbon Commission has delayed a necessary consensus expenditure.
- The HPC survey should include follow-up interviews with researchers.
- A separate survey focusing exclusively on data needs should be distributed to faculty following completion of the HPC survey.
- Research faculty members are interested in fast input/output to high performance computing. The 2 TB Isilon storage has proven slow, perhaps limited by a 1 Gb line. Though USC has a 10Gb backbone, data transfer speeds are slower elsewhere.
- UTS should continue talks with vendors about HD (High Density) nodes and ECS (Elastic Cloud Storage) for deep archives.
- The committee continues to support a center for academic and scientific computing to compete for large collaborative grants.

3. Classroom Enhancement

Following a January 2016 discussion of technology needs for hybrid courses and the difficulty in meeting quality standards for distance education courses, we scheduled a meeting to discuss a project underway to implement Ensemble for digital management and streaming video. Ensemble's Academic Media Portal is designed to replace Windows Media System, which requires too much human intervention. It will be adopted for all UTS courses and be offered as an Enterprise solution to other units. Academic Media Portal could also assist with flipped classrooms.

UTS prepared an extensive spreadsheet on classroom technology that could be used to provide accurate information on classroom IT to schedulers. The committee revisited its April 2015 white paper on classroom technology. We called attention to the difficulties posed by dispersed control of classroom technology improvements; lack of standardization presents challenges for faculty who expect interfaces and capabilities to be consistent. In a follow-up meeting, Jeff Hostilo discussed the appropriate mix of low-service and high-service technology classrooms; low-service classrooms comprise only 10% of rooms. We also discussed renovation priorities; perhaps too much emphasis is placed on large classrooms as opposed to classroom buildings.

Recommendation:

- The tiers discussed in the committee's white paper could conflict with a move to more flexible classroom spaces. The Provost noted that flexible classrooms had cheap tech fixes (e.g., technology on a cart) that made them attractive from a cost perspective.
- UTS and the registrar should improve coordination to make sure 25 Live stays up to date with classroom technology information.
- The committee recommends an increased pace of classroom enhancement. There may be sufficient personnel to update 50 classrooms per year, though budget and sufficient classroom down-time are obvious obstacles.
- The committee should seek collaborative opportunities with the Committee on Instructional Development, perhaps starting with a joint meeting in Fall 2017.

4. USC-IBM partnership

During the November 2015 meeting with the Provost, committee members asked if anyone from the academic side of USC was talking with IBM. The Provost said that their office had just begun discussions with IBM. Committee members noted that there was considerable passion among faculty about IBM and the lack of transparency in our relationship with them; faculty were unsure of implications of the IBM contract, and IBM was seen as an anonymous gatekeeper. On the other hand, some faculty have a history with IBM (e.g., through IBM's Academic Initiative), and IBM may be at a stage to move to a more visible role on some issues of interest to faculty. Invitations to IBM to attend a committee meeting fell through this year. UTS did discuss the Center for Applied Innovation. We discussed the need to clarify how IBM expects to be approached by the University such that all interested parties feel invited.

Recommendation:

- The Center for Teaching Education or Office of the VPR should make a call for IBM-sponsored proposals.
- There is a need for coordination between the committee and IBM, including an IBM representative on the IT standing committee.

5. Software licensing

Phil Moore prepared multiple Matlab quotes for a system-wide license for faculty/staff/students. The license includes floating licenses and personal PC licenses, all toolboxes we currently use, and parallel computing on Unix/Mac/PC platforms. During a meeting of college IT reps, there was widespread support for a system-wide solution. After discussion of several alternatives, UTS will approach units and then the Provost for support, with any gap in funding covered by a charge-back model.

During the November 2015 meeting with IT reps, discussion focused on estimated use of Adobe Acrobat Professional and the Creative Cloud suite, and distribution of use across units. Renegotiations of the Adobe license were to begin in mid-March 2016, and Adobe now shows much less flexibility in negotiating licenses.

UTS suggested ordering a fixed number of licenses (e.g., 5000, though this figure may be too low) and then paying for individual licenses if demand was greater. Free or reduced cost alternatives to Adobe Acrobat may be possible, but would have to be thoroughly researched. Use of Creative Cloud is lower (approximately 800-1000) and more unevenly distributed; though units coordinate through UTS on licensing (UTS is the sole representative), a university-wide approach may not be the best solution.

The committee and IT reps converged to a consensus on: negotiating together when possible; seeking subsidies for campus-wide needs; seeking alternatives to Adobe Acrobat and negotiating with Adobe with more input from units. UTS planned to approach CAS and CSE about possible buy in with the aim of securing commitments by mid-April and then advancing a proposal to the Provost. We did not follow-up on UTS' progress before the end of the academic year.

Recommendation:

- Members of the committee continue to advocate for a nominal annual cost for Adobe Acrobat, given the requirement for its use in administrative, research and teaching functions. Alternatives to Adobe Acrobat should be researched in full and a recommendation prepared for the committee.
- The system-wide Matlab license should be pursued through unit contributions, with the remainder coming from the Office of the Provost or the

Vice President for Research; a modest charge-back remains an alternative, but should not be necessary.

6. Banner

Aaron Marterer cited 2014-2015 as an effort to promote stability—to ensure consistency between Banner and legacy systems and between Banner and Data Warehouse. A major upgrade (to Banner 9) will not be fully in place until Fall 2017. 2015-2016 will focus on service, including improvement of the end-user experience. Banner 9/Banner XE's roll-out will be slowed in part due to resources diverted from Banner to financial and HR data management in PeopleSoft.

Prof. Juan Caicedo, Civil and Environmental Engineering, continued his work on the Banner Ticketing System; the work was delayed by other projects, but was essentially functional by the time of his Fall 2015 report. Juan met with Harry Ploehn, Rita Anderson and Aaron Marterer to hand off the project to UTS to finish. UTS thought it would be impractical to implement in Drupal or Sharepoint, but the structure could be readily replicated in a more familiar platform. The system would remain college-based, and UTS was generally comfortable with the design of the system. Expenditure on the system was approved by the Provost's office in Fall 2015 and the project was on track for delivery by late April. The committee was concerned that the system be in place in time for Fall 2016 advisement.

Aaron Marterer discussed a draft proposal for a portal to access Banner and other self-service technologies. He developed the proposal as a way to outline the basic functional requirements of a portal for the USC system after the portal fell out of scope in the Banner implementation. As a result of preparing the proposal he determined: 1) no currently extant off-the-shelf portal is sufficient because of the unique complexities of our eight-campus system, 2) IBM did not think they could build one for the same reason. The committee discussed whether successful Banner implementations could be used as models for our system; Aaron felt it was wrong to focus on the tool; the focus should be on USC's digital strategy instead.

Recommendation:

- The committee would like the Banner ticketing system to have as many user-friendly features as possible (e.g., screen capture, links in Banner, and coordination with the existing UTS Help Desk, a point-and-click interface)
- The committee would like the ticketing system to provide regular status updates for more protracted processes
- The workflow in the new system should be consistent with the workflow approved by the One Carolina team.
- Committee members noted that in this area, as in others, it seems that the major issues are not technological, but administrative. Unless administrative issues are solved, technological solutions cannot succeed.

7. PeopleSoft

Harry Ploehn, Vice Provost and Director of Academic Planning, discussed PeopleSoft training for Principle Investigators in Fall 2015. His office planned a training roll-out on financial (rather than HR) software; the training proved unsuccessful. Intranet2 will continue to be used for some functions, though this was seen as an unsuitable stopgap.

Recommendations

- Invite Richard Moak from the PeopleSoft team to a joint meeting with the Faculty Budget Committee to discuss faculty issues with PeopleSoft.

8. Cyber Security

UIISO staff (University Information Security Office) made two presentations this year. UIISO has two responsibilities: managing the university-wide information security program and the university-wide incident response procedure.

The State of SC, in response to the 2012 Department of Revenue data breach, developed SCDIS-200 in April 2015 based on a NIST framework. All state agencies must comply with 342 separate security controls.

Each organizational unit should have a qualified security contact and alternate to act as the security liaison between the unit and UIISO. UIISO met with the security liaisons over the summer in an effort to build a stronger community. Compliance with the existing security program needs improvement.

SecureCarolina ended in June 2015, but new tools have been added—multifactor authentication, whole disk encryption, Symantec data loss prevention, Microsoft OneDrive for Business, SecureDocs, incidence response, better network monitoring, etc. All university-owned equipment should have three pieces of security software—(DLP, incident response and anti-virus; Whole disk encryption is only required for those with confidential data)

UIISO renovated its Secure Carolina web site in December. It plans to roll out a new data loss prevention solution: Identity Finder, which works differently from the Symantec endpoint protection, in that the end user can see the results and has options to delete, mask, or secure the data. At the April meeting, John Sturgis discussed three topics: information security update (IT 3.00 update), security liaisons, and minimum security standards update. Minimum security standards focus on practical security, with an emphasis on simple steps to improve security. Methods rely on the latest internal threat data combined with industry research, particularly Verizon's Data Breach Investigations Report. Their office looks for similar targets to identify

workable solutions; education is better than a “secure” server, especially in a system with so many insecure access points.

Recommendation:

- Communication on the need for security has not been as effective as it could be; a list of liaisons would be a starting point.
- Liability exposure for security liaisons needs to be better researched and a policy to protect security liaisons should be put in place.
- Recommended controls after security breaches should be designed to meet researchers needs to the extant possible
- Faculty should be better educated in the use of encryption and backup systems.