

## **SACIT Report to the Senate for Academic Year 2017-18**

### **Committee Charge and Role**

The primary function of the Senate Advisory Committee on Information Technology (SACIT) is to provide a mechanism for faculty input in the University Information Technology (IT) governance process, as specified by university Policy 6.002 III D.1.I:

*The primary role of the Committee is to ensure ongoing robust communication among representatives of the University's academic users of information technology (especially faculty and students), and administrators responsible for planning, acquiring, employing and operating information technology resources. Such administrators shall regularly inform and consult with the Committee regarding information technology resources. The Committee should regularly consult with information technology user constituencies and convey input to relevant administrators.*

The committee was established to ensure that faculty members could contribute to the governance and strategic planning of the University Information Technology (UIT) office. The committee takes direction from the Academic Senate and is willing to provide advice on any IT policy and assist with strategic decisions.

The committee is expected to provide input to IT governance both reactively and proactively. In its reactive role, the committee comments on new and ongoing projects that are likely to have an impact on the academic mission of the University. The committee chair monitors issues arising in IT governance committees that should be brought to the SACIT for discussion and reports back to those committees with the SACIT input. The proactive contribution of the SACIT involves identifying and discussing emerging issues affecting the academic mission, especially those that may not already be under discussion by UIT.

As is the case for other Senate committees, the SACIT is required to provide each year a report documenting the committee's work. In this report, we summarize the issues addressed during the 2017-18 academic year and make some recommendations concerning both specific issues and the overall management of IT resources at the university.

### **Issues of Concern Raised by Committee Members**

At its first meeting, in September, the committee prepared a list of issues of concern to the members of the committee. The list of these issues and those raised to the Chair of the committee by Dr. Steve Hess (Chief Information Officer) are as follows:

- Network funding models
- Faculty and student analytics
- Student IT resources and services
- Allocation of learning spaces-student computing fee (LS-SCF) funds
- Utilization of existing software
- Principles guiding decisions to purchase or develop new software in house
- Downtown data center
- Classroom AV technologies
- IT security

This list covers a range of topics much greater than could be addressed in a single academic year, and the committee selected a subset of them to address this year. To facilitate discussions, key individuals from different IT sectors were invited to present to the committee and discuss some of their challenges and how they are addressing them. The topics addressed at the individual meetings and the invited guests at those meetings are summarized below:

Meeting	Topic	Guest
October	Faculty Data	Jeffry Uffens, Director of University Faculty Information and Support
November	Data center	Tour of downtown data center, led by Anita Orendt, CHPC
December	University IT	Steve Hess, Chief Information Officer
January	Student IT services	Cory Stokes, Associate Dean and Director for UOnline
February	IT Security	Randy Arvay, Chief Information Security Officer
March	Classroom AV	Jon Thomas, Director of Teaching and Learning Technologies
April	Research Computing	Tom Cheatham, Director of CHPC

The following observations emerged from these presentations

**Educational IT and Classroom Audio/Visual Systems:** The success of students at the University of Utah is closely tied to the IT resources available to them and their ability to effectively utilize these resources. Services provided to students include online tools for registration, applications for financial aid, e-mail, and delivery of course materials, as well as the direct use of computer hardware and software in many classes.

To help coordinate campus efforts related to student IT services, then Senior Vice-President Watkins established the Integrated Student Team (IST) in the spring of 2016. This group is made up of senior officers of the university with responsibilities in areas including registration, curriculum management, financial aid, advising, online courses and student data analysis, among others.

During the January meeting of the SACIT, Mr. Cory Stokes (University Chief Digital Learning Officer and IST co-chair), made a presentation describing for the committee the mission of the IST and its current projects. The charge given to the IST by then SVP Watkins is:

*IST is charged to guide the University of Utah as we design, develop and implement an improved, unified experience across the student life cycle. Team members represent their functional areas and roles within the university, and step beyond their own areas to consider the best interests of students and the university as a whole. Overall, the IST will be guided by a commitment to improve the student experience at the University of Utah.*

Mr. Stokes briefly described the very large number of online systems that are involved in various aspects of a student's tenure at the university. These include systems provided by vendors, such as Canvas, Oracle and Kuali, as well as solutions developed at the University. Integrating these different systems is clearly a major challenge and an area for potential cost savings and improvements in efficiency. The primary task of the IST is to recommend priorities for investment and effort among the various student IT services. However, the IST does not have budget authority and makes its recommendations to the senior university leadership, which then makes decisions regarding implementation. The committee noted that budget decisions are not always aligned with IST recommendations.

During the discussion with Mr. Stokes, members of the SACIT raised some concerns about the organization of the ITS and the potential impact of its decisions on faculty and instruction. Notably, the IST does not include faculty representation, but Mr. Stokes explained that the members of the group work extensively with faculty and thus are in a position to convey their impressions of faculty needs. To insure that a faculty viewpoint is more directly represented, it may be appropriate for IST to include one or more faculty members with appropriate expertise and perspective. There was also a concern raised about the possibility that the emphasis on a “unified experience across the student life cycle” might impact the ability of individual instructors to choose particular software or resources for their courses. Mr. Stokes assured the group that there was no intention to standardize software and that an effort was underway to catalog the software currently used in courses across the university, with the intention of making this software available to students off campus as well as on. This is an area that will require considerable work in the future, and it is important that faculty are included in any plans to centralize software resources that impact teaching.

Another area of IT services that directly impacts faculty and their students are the audio/visual systems that are now found in nearly all classrooms on campus. Frequent complaints among faculty are that the systems in different rooms work differently; that there are often problems connecting laptop computers to projectors; and that it often isn’t clear who should be contacted when these problems arise. These questions were also discussed with CIO Steve Hess at the December SACIT meeting, and again with Jon Thomas (Director of TLT) in the March meeting. Dr. Hess readily acknowledged the need for greater uniformity in AV installations and described efforts by the Teaching and Learning Technologies (TLT) office to bring this about. TLT has defined several standard classroom AV installations that use a common user interface, and all installations by TLT follow these guidelines. These now include all systems that are funded by Learning Spaces-Student Computing Fee funds (typically rooms that are scheduled by departments, rather than centrally). Unfortunately, outside contractors for new buildings or renovations are not currently required to follow the same AV guidelines, often leading to inconsistencies with existing facilities. This is another issue that requires follow up and improvements.

**IT Security:** Dr. Randy Arvay, Chief Information Security Officer, provided an overview of the many challenges to IT security within the University of Utah. The Information Security Office (ISO) is structured to manage risk, access, and security across multiple layers (person, device, logic, circuit, geographical), while supporting the diverse needs of University faculty, staff, administrators, and medical personnel. Currently, top threats to IT security at the University include phishing attacks, malware and ransomware, encryption blind spots, cloud and vendor dependencies and risk, and employees who engage in practices that unintentionally create vulnerabilities in our systems.

The results of two IT security audits last year noted that much sensitive data is departmentally managed, and that departments vary in terms of their awareness and willingness to properly secure data. Faculty and researchers are largely responsible for the security of their own research and student data. These practices allow for flexibility and freedom for faculty and departments in terms of accessing data. However, there is lack of uniformity and training for overall IT security and lack of enforcement and knowledge of data standards. Further, sensitive and restricted data often exist on multiple devices, including personal devices that are not owned by the University. To address these issues, UIT is working to clarify and reinforce the Data Classification Policy. Further, ISO is creating a University wide security awareness training and HIPAA security training that was released in December of last year (2017).

Particularly relevant to this committee is the behavior and demands made on faculty for IT security and awareness. Specifically, the committee acknowledges the critical role faculty play in securing data in the University environment, and the need to educate and inform faculty of security threats, best practices, and standard operating procedures with regards to cyber security and compliance. Further training and help is needed to educate and train people about data classifications, rules, and compliance with efforts extended to support present and emerging compliance mandates such as FISMA (Federal Information Security

Management Act), NIST 800 171 and CUI (Controlled Unclassified Information) that may be imposed on awarded grants and contracts.

**Faculty Data:** On October 20, 2018, Jeffry Uffens, Director of University Faculty Information and Support discussed the goals of Mission Based Management and FARA systems in an extended conversation of the modifications to the Faculty Activity Report (FAR) and the new Tableau software. The revised FAR report includes new features by offering more options for importing data (including bibliography files from external systems such as PubMed, Scopus, and Academic Analytics), submission processes, and simplified navigation. The updated FAR homepage reflects branded University profiles that are fully indexed for campus Google search as well as opportunities for departments to utilize FAR data on their sites to create faculty web profiles. Committee members enthusiastically welcomed the revisions.

SACIT committee members questioned how much institutional data is generated, acquired and maintained for the purpose of official administrative duties and research. Questions included: How is data grouped and organized in a context required by users? How and by who are these organization decisions made? In an effort to create transparency the committee requests a white paper outlining policies and procedures detailing data access and review policies.

The committee was introduced to the newly licensed Tableau analytics software and informed of its use and possible applications (<https://bi.utah.edu/tableau/>). The Office of Data Management and Visualization utilize their server license based on existing hardware and bandwidths, but it does not offer a site license for the desktop tool. Departments who want this resource will need to purchase departmental copies at approximately \$1,200 per license and \$300 a year maintenance, a cost that is prohibitive to some departments. Currently, the IDMV Tableau Server does not have the resources available for individual research projects or for a single data analyst within a department, but permission may be granted if a department is making the request. We recommend that UIT outline parameters of appropriate use criteria in an effort to generate successful requests for this visualization server.

**Research Computing:** Professor Thomas Cheatham, Director of Research Computing and the Center for High Performance Computing (CHPC) in University IT, provided an overview of the general IT services provided by CHPC, the growth in demand and diversification of services offered, and discussed issues of sustainability and challenges with the current funding model from the discretionary part of the F&A (facilities and administration) overhead pool. Of particular concern is that as exploratory developments and innovations, often seeded by grant funding and pilot efforts, eventually may move into production and become necessary and highly utilized components of the university's cyberinfrastructure. Yet, sustained funding to retain these capabilities has not been incorporated into CHPC's or UIT's budget. Two examples of this are the science "firewall bypass" (or science DMZ which provides a capability for high speed data transfers to bypass the campus firewall preventing their saturation and degrading performance of the network for everyone) and the Protected Environment (PE, allowing compute and data handling for restricted data such as protected health information). Funding for the replacement of the PE was not granted as one-time funding requests and instead was achieved by award of a NIH S10 equipment grant to CHPC. Replacement of the science DMZ will be required in the coming years, however as novelty moves into the mainstream, the capabilities are not readily fundable by grants due to lack of innovation.

Services to support modern research include ever-increasing and broadening demands for computing, data, and networking infrastructure, software, and people to support the expanding cyberinfrastructure needs across all domains. As a campus, to remain competitive with our peers and to facilitate faculty recruitment and retention, sustained investment in research computing services is necessary. CHPC has diversified well beyond its initial roots in HPC into virtual machines, resources for data management, movement and analyses of both open and restricted data, and resources for application support, facilitation and user support

to enable the effective use of modern cyberinfrastructure by researchers. Funding to support this explosive growth as a general service provider has been flat or down since 2013. The current funding model is that for anything beyond modest compute or data, researchers can purchase hardware at cost (including proportional costs of power and network infrastructure) with costs of staff and people covered by the F&A allocation. This model is attractive to research groups since they then do not have to dedicate local resources to maintain compute infrastructure. CHPC also pays for 1/3 of the Downtown Data Center operations and actual power used.

The models need to evolve or CHPC will need to eliminate services. The primary reasons the current funding model, via the discretionary F&A pool, is not sustainable are:

- (1) The growth in demand for services across all domains, including the health sciences
- (2) The increasing diversification and specialization of service offerings
- (3) The hidden costs of novel capabilities and unfunded mandates (science DMZ, security)
- (4) The mandated growth in DDC personnel and power costs compared to the growth in the F&A pool

CHPC has been able to deal with these increases to-date via grant funding, automation, “free” or lower cost software, trimming leadership, student program employees, and inclusion of additional costs into hardware purchase to support base infrastructure. However, it has now reached the tipping point and has exhausted the means to reduce and/or further optimize the costs. Instead, we could push additional costs on to researchers; however, this will lead groups to roll their own services in their labs or closets to “save” money leading to security and compliance risks, not to mention hidden power costs. We could also drop specific services; however, it is unclear how to provide or replace these with equal or less costs or levels of service by entities outside of CHPC.

SACIT strongly supports the need for critical IT services, such as research computing, college support, and centralized services and encourages a dialogue with administration to define a path to sustainability across campus.

**Overall University IT:** Dr. Hess gave a very comprehensive presentation of the state of IT on campus. He described the funding sources for central IT and the governing process to manage projects and priorities of UIT. He also noted that there are substantial IT resources that are not under the control of UIT (i.e. those controlled by colleges, departments, institutes, centers, hospitals and other organizations), and there are very few policies that enforce coordination. Due in part to this decentralization, there may be a great deal of redundancy in the development of software in different organizations and missed opportunities to fully use existing software or purchase suitable solutions.

During the 2014-15 academic year, the university commissioned the Deloitte consulting firm to perform a comprehensive audit of the university’s IT resources and services, at all levels. Many of the Deloitte recommendations have been implemented, but lack of vertical integration makes this complex. Better coordination and more rigorous process for vetting the acquisition of new applications by operating units outside of central IT will be critical for optimizing the IT resources at the University. Most likely this will require policy changes that mandate a rigorous vetting process of any applications that may have enterprise wide impact.

## Overall Observations and Recommendations

Through its discussions with campus IT leaders, the committee has become increasingly aware of the general lack of strategic planning necessary to provide the IT resources and services that are essential for a research university in the 21<sup>st</sup> century. Although the university leadership recognizes the critical importance of IT, especially data services, this recognition does not always translate into the strategic thinking needed to develop **an overall IT and data architecture that can support the leadership goals in a scalable and sustainable manner**. Specific IT and data services are often viewed as solutions to specific problems and/or initiatives, without proper consideration of how these individual solutions may impact one another. In this way we lose important synergies that may reduce cost and increase effectiveness. In this environment it is common to observe some of the symptoms arising from the lack of architectural cohesiveness in the system. For instance we observe that the IT units are extremely reactive and they tend to deploy “one of a kind” patches to respond to faculty, administration and staff needs. The lack of a well-coordinated architectural approach often results in a **non-scalable infrastructure**, in which the canonical response from the IT units to the pressure to implement more services is “*we need more resources*” (aka people) to develop more and more “*ad-hoc*” patches to calm unsatisfied users.

This problem is common to many organizations that have rapidly transformed into intensive information enterprises. One approach to deal with this issue is the creation of a high-level position (with perhaps a very small staff), often designated the Chief Technology Officer<sup>1</sup>. This office typically has no operational responsibilities and a very small budget, providing independence and allowing concentration on strategic thinking. The **CTO should have a very deep understanding of informatics and data architectures** with the ability to take an overall system view to align institutional priorities with the deployment of IT and data services. The CTO organizes both internal and external reviews of the different aspects of IT as a way to increase transparency of operations and reinforce the alignment of institutional strategies with IT and data services. The CTO has such stature in the organization that he or she is able to ask the “**hard**” **questions to both the IT organizations and the University leadership team**. Asking the hard questions is of fundamental importance for both teams to understand the unexpected effects of implementing conflicting and/or non-synergetic solutions that from the tactical view-point may appear simple and independent services, but that can have severe adverse effects on other components of the overall system.

## Specific recommendations

- Support ISO in its efforts to create University wide security awareness training
- Include faculty representation in Integrated Student Team (IST)
- Improve standardization of AV equipment across all learning spaces
- Help to define a path to sustainability for research computing services
- Provide SACIT with white paper outlining policies and procedures detailing faculty data access and review policies
- UIT outline parameters of appropriate use criteria in an effort to generate successful requests for Tableau visualization server
- Consider the establishment of the CTO position within the President’s Office

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<sup>1</sup> The university does already have an officer with this title (currently Mr. Jim Livingston), but the duties of this individual are focused entirely on operational matters, rather than strategic planning role suggested here for the CTO role.

## Committee roster

Kim Martinez	2017-2018	Elected, Faculty	kim.martinez@art.utah.edu	Fine Arts
Ross Walker	2017-2018	Elected, Faculty	ross.walker@utah.edu	Engineering
Thomas Cheatham	2018-2019	Elected, Faculty	tec3@utah.edu	Pharmacy
Jeremy Myntti	2018-2019	Elected, Faculty	jeremy.myntti@utah.edu	Libraries
Kelly Broadhead	2019-2020	Elected, Faculty	kelly.broadhead@utah.edu	Engineering
Alexey Zaitsev	2019-2020	Elected, Faculty	zaitsev@cvrti.utah.edu	Medicine
Randy Dryer	2017-2018	Elected, Faculty, Career-line	r.dryer@honors.utah.edu	Law
Peter Jensen	2018-2019	Elected, Faculty, Career-line	pajensen@cs.utah.edu	Engineering
Trisha Weeks	2019-2020	Elected, Faculty, Career-line	trisha.weeks@psych.utah.edu	Social and Behavioral Science
Rohit Aggarwal	2017-2018	Elected, Faculty, Tenure-line	rohit.aggarwal@business.utah.edu	Business
Julio Facelli	2018-2019	Elected, Faculty, Tenure-line	julio.facelli@utah.edu	Medicine
David Goldenberg	2019-2020	Elected, Faculty, Tenure-line	goldenberg@biology.utah.edu	Science
Xan Johnson	2017-2018	Ex officio, Senate	xan.s.johnson@utah.edu	Senate
Margaret Clayton	2017-2018	Ex officio, Senate	margaret.clayton@nurs.utah.edu	Senate

Administrative Support: Tahanie Branz (tahanie.branz@utah.edu)