Report of the 2016-2017 Faculty Senate Information Technology Policy Committee

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INTRODUCTION:

This report summarizes the activities and recommendations of the 2016-2017 Information Technology Policy Committee (ITPC). The ITPC received the following 6 charges from the Senate Agenda Committee (the boldfaced initial topics for each charge were added by the ITPC in this report for clarity of reading):

2016-2107 Charges:

1. **Educational technology:** The ITPC shall review the adequacy of technology available in the classrooms, and survey new technologies to make the classroom experience more engaging and interactive.

2. **Learning Management Systems (LMS):** The ITPC shall review alternatives to the Blackboard course management system. ITPC should meet with the NU ITS group working on this topic and review their recommendations, and shall provide independent recommendations that address student and faculty needs and usability requirements.

3. **Research computing support:** The ITPC shall work with NU ITS to identify support options for non-imaged research computers.

4. **Backup and website support:** The ITPC shall work with NU ITS to identify options for easy-to-use centralized backups, server storage, and web site design and hosting services, for use by both imaged and non-imaged research computers.

5. **Follow-up on 2015-2016 resolutions:** The ITPC shall report on the implementation of the approved 2015-2016 ITPC resolutions.

6. **Other priorities:** Other priorities, to be determined by the Senate Agenda Committee, may be charged as they arise.

In light of Charge #5, ITPC reviewed the four resolutions from last year's ITPC, all of which were passed (with no negative votes and only one abstention on one resolution) by last year's Senate, and all of which were then not approved by the Provost. The full text of these resolutions and the Provost's reasons for rejection are in the Appendix to this report, but we summarize them for clarity here:

1. Improve grants management software tools available to faculty. Rejected as too specific and because a process was apparently already underway
2. Set up regular meetings and a website for improved communication between ITS and faculty. Rejected as only partially acceptable, the website part of the resolution was considered too specific and problematic.
3. Set up a faculty / ITS committee on cybersecurity. Rejected as something the Senate should do if it want to.
4. Improve software procurement process. Rejected as too all-encompassing.

GENERAL 2017-2018 ITPC ACTIVITIES

ITPC met early in the fall semester and discussed our charges, last year's resolutions' outcome, and other IT issues of concern to committee members. ITPC chair Prof. Brooks and SAC liason Prof. Bickmore then met with Rehan Khan, Vice President of ITS and CIO, and two of his senior staff member. Based on those discussions ITPC discussed a broad variety of topics and ideas for improvement, and Prof. Brooks engaged in multiple rounds of email exchanges with Vice President Khan. These exchanges included requests for information on ITS activities, services, and committees, user activity data, and for response from ITS to a number of suggestions from the committee. ITPC members felt these exchanges were generally positive and productive, and we believe they have set the stage for significant cooperative moves forward in multiple area of mutual interest, reflected in our charge and last year's resolutions as well as in our detailed report below.

In addition several ITPC members met with Prof. Whitford (Physics) and Rajiv Shridhar of ITS, the co-chairs of the ITS Research Computing committee, and one or two ITPC members held four conversations regarding grant management software support, with Greg Condell, Dana Carroll, Terri Waggett, research administrative staff in the College of Engineering, and Prof. Nita-Rotaru (the chair of the Research Policy Oversight Committee which was also working on this same concern).

In the process of these meeting and discussions ITPC identified nine distinct areas in which we suggest activity and improvement are needed. These specific topics are addressed below, along with our recommendations for Senate action this year and/or planned activity by the 2017-2018 ITPC.

SPECIFIC ITPC ACTIVITIES AND RECOMMENDATIONS

1. Communications: Both ITS and ITPC identified the need for improved communication among ITPC, ITS, and faculty as a critical and overarching need. We found a number of areas -- some of them detailed below, including backup services, website support, research computing support, help for Blackboard, and others --- where ITS offers services that many faculty seem to be unaware of, and on the other hand a number of faculty needs where ITS did not seem to have a means for faculty input, including areas such as cybersecurity, software procurement, orientation and user support. Faculty on and off ITPC have voiced their frustration and concern about not knowing who to contact for ITS related issues (Blackboard, research programming support). New faculty indicated that their orientation to ITS was very sparse and as a result, they often did not know who to call or go to for specific issues . The need for, and desire for, better communication mechanisms was strong and mutual.

Thus after considerable discussion among ITPC and between ITPC and ITS we arrived at the following set of recommendations:

i) An ITS representative should visit one college faculty meeting per year per college (8 total

plus possibly CPS). ITS also offer follow-up meetings at the department/unit level to any interested department/unit. SAC or ITPC should contact College Deans (or their IT directors where they exist) and ask them to identify a faculty member / administrator who will be responsible for coordinating their ITS visits.

ii) A faculty-facing ITS Organizational Chart that includes specific names and responsibilities as well as updated ITS resources should be created and disseminated. Categories ITPC suggests should be included are areas such as data backup, data sharing repositories, programming support, software support, website support, laboratory computing, high performing computing, desktop support, mobile device support, specialized shared computational resources, peripherals, security, and Blackboard / LMS support. A suggestion from ITS that ITPC supports was that there should be both a help email created and an ITS staff person identified for each of these (or a similar set of) categories.

iii) There should be at least 2 meetings per year scheduled between ITPC and ITS.

iv) ITS should set up faculty (or broader as appropriate) user groups that will facilitate active discussion of a diverse set of topics of interest, each with an appropriate ITS point person as the contact for the respective group. We would encourage these user groups to take full advantage of modern social platforms including a curated website with FAQ and links to resources, an email list, some kind of shared asynchronous communication facility such as slack, and regular seminars by industry and faculty experts. ITPC suggests several initial areas for user groups could be chosen from topics such as programming education / support (examples: R, python, GPU programming, embedded systems), platform specific needs (eg Macs, High Performance Computing (HPC)), and data and software sharing. These user groups could also facilitate wider University-wide communication about on-going educational activities run by student professional organizations and clubs, centers such as the Sherman Center in COE, etc.

v) ITS should be given a formal role in orientation of all new faculty. The orientation should include information and resources related to all aspects of ITS such as backup services and Blackboard / LMS.

ITS through VP Khan has agreed to support all or part of all these initiatives. It is not clear to ITPC if formal Senate resolutions would be required or helpful.

2. Research computing: Based on discussions with VP Khan, Rajiv Shridhar, and Prof. Whitford, our understanding is that the main support effort of ITS and the Research Computing Committee has been focussed on HPC, and in particular Northeastern's facility in the MGHPCC building in Holyoke MA. In addition we learned that Mr. Shridhar now supervises 3 full-time staff to support research computing, one dedicated to HPC / Linux computing support and the other two to programming support, primarily for HPC and GPU computing, one with a mechanical engineering background with primary responsibility to support engineering researchers and the other with a science background with primary responsibility to support science researchers. In addition ITS typically has two to three coop or part-time work-study,

undergraduate or graduate, students in any given semester also engaged in research computing support. ITPC recognized that this is a significant investment by ITS in upgrading its research computing support.

On the other hand the diversity of ITPC members and their research computing needs reflected the very broad and heterogeneous level of research computing activity and needs across all colleges and many platforms and software tools among Northeastern faculty. The Research Computing Committee representatives we met with agreed with ITPC members that a significant effort is required to broaden and diversify the support of research computing, and that this will require a focused effort and perhaps the commitment of additional resources.

In addition, we note that many funding agencies and journals now require that investigators maintain a data repository that includes raw data and source code associated with progress reports and/or publications. This material should be maintained on a centralized university repository with backup and a catalog with a user interface that is available to the public.

Thus we recommend that in fall 2017 ITPC be charged to work with ITS research computing staff and members of their Research Computing committee to reach out to a broad range of faculty, across all colleges, who use computing in their research and propose a plan for broad-based research computing support along with an estimate of the personnel and other resources required to provide that support.

3. Security: In initial discussions with VP Kahn he was enthusiastic about the idea of setting up a joint faculty / ITS committee as described in one of last year's resolutions. Prof. Kirda, who was chair of last year's ITPC and a member of this year's, followed up with VP Khan and they agreed to form a committee whose membership would be 50% faculty with relevant expertise, and 50% from ITS. They are now in the process of forming this committee and Prof. Kirda is actively recruiting faculty to be members of this committee. Thus no further recommendations or resolutions seem required here as this process continues to move forward along its current path.

4. Grants management software: The various conversations ITPC members had about this topic with relevant administrators made clear that there are two parallel efforts underway among both finance and research administrators, mostly in central administration. One is a long-term comprehensive effort to determine the full set of requirements for a broadly integrated software infrastructure across the University. Our understanding is that this is expected to take several years and an investment of very significant funds.

In the meantime, there is also a broad recognition that the situation with respect to faculty-facing grants management software, in particular reporting and projections, is in a near-crisis state and thus a short-term solution is badly needed. There have been efforts to investigate one particular software package for this purpose, called Priority One, but it is not clear to ITPC that this will provide either the required capabilities, including projections, nor whether it will have the required interface to the University's central data warehouse or the Banner software infrastructure. We were also told that there is another system called Cognos

presently supported by ITS but not very well known across the Colleges which provides some but not all of the needed capabilities. Two Colleges, COE and CCIS, have home-grown reporting systems at different levels of automation and reporting detail. Dana Carroll also shared with us an externally written white paper surveying existing systems which was primarily focused on pre-award functions (rather than the post-awards functions where the problem is most acute) but which contained general conclusions that apply to both, including the lack of any comprehensive available tool, the tradeoff between more complete but less flexible systems and more flexible systems but which require more internal support, and the need for significant faculty input into any decision about solutions.

In summary, ITPC recognizes that the current difficulties stem from a variety of factors, including among others the inherent difficulties involved, the lack of a consistent level of administrative support personnel, and training of that personnel, across the Colleges, possible lack of adequate support resources in ITS, and, not least, the lack of adequate faculty input into the process to date. ITPC also believes that a significantly improved short-term solution for faculty-facing and College-facing post-award software support is, as stated above, essential not only to allow faculty to focus on research rather than accounting but also to help protect against potential problems should the University face an audit or other challenge from a funding agency.

Thus ITPC recommends that an ad-hoc committee with representation from ORAF, ITS, the Deans of the Colleges, and either ITPC or ad-hoc SAC-appointed representatives, be set up a soon as possible and be charged to propose an appropriate short-term plan by the end of the fall 2018 semester, including an assessment of required commitments and resources from all relevant constituencies.

5. Classroom technology and LMS software: The ITPC was tasked with exploring ways to enhance the experiences of faculty and staff regarding learning management systems (LMS) on campus. VP Khan provided the ITPC committee with a draft of a white paper that the LMS working group had put together regarding their evaluation and recommendation for a learning management system at Northeastern University. The working group was formed in December 2014, and was comprised of administrators and faculty across campus, but did not include any representation from tenure-track and tenured faculty members. This working group recommended that, based on a pilot test of three learning management systems (Canvas, Schoology and Blackboard), the University should continue with Blackboard Learn 9.1. It also proposed to consolidate the two existing NU platforms (full-time colleges and CPS) into a single system. The ITPC subsequently sent questions to Mr. Khan regarding usage rates of Blackboard, its costs, as well as the types of complaints logged by ITS. It also asked for Mr. Khan's professional opinion of Blackboard. VP Khan provided detailed responses to the queries, some of which are included in the appendices to this report, and indicated that although competitor options to Blackboard exist, the challenges of migrating 30,000 existing courses to a different system could have an adverse influence on students and faculty.

The ITPC continues to have reservations about this decision, in particular in the absence of organized input from a broad range of faculty as well as the apparent implicit assumption that

ITS will only support one mode of LMS interaction. VP Khan wrote to the ITPC, describing ITS' view of LMS, "The LMS landscape continues to evolve. We will continue to work with our faculty to understand the ever-changing requirements and at the same time research, evaluate and test new technologies to enhance teaching and learning." In the spirit of this comment -- and with an eye toward including more faculty who are dissatisfied with the current single option -- we believe it is time to revisit this issue again. Thus we recommend that ITPC undertake two tasks regarding LMS during the 2017-2018 academic year:

i) undertake a campus wide survey of faculty, students and administrators on Blackboard usability, as well as on attitudes and suggestions for improvement; and

ii) explore the feasibility of having ITS offer and provide support for alternatives to Blackboard, while at the same time maintaining and supporting Blackboard for faculty and students who would like to continue using that system.

6. Software procurement process: ITPC was not able to obtain much clarity about the current software procurement / support process. How are decisions made about what software will be supported centrally and what software will be supported by individual units or faculty? How can faculty propose software for purchase? How can faculty reach out to colleagues to determine if there is a substantial shared interest in a particular software package or in obtaining software for a particular use? And how can ITS and interested faculty effectively work together to help ITS make appropriate software purchase and licensing decisions that respond to faculty needs and initiatives.

ITS emphasized that they maintain a website listing all available software resources, but ITPC believes, and we think ITS would agree, that faculty awareness of this resource is low and is one aspect of the communications gap described above. Thus the steps proposed above to address the communication gap may also help to solve this problem or lead to steps to be taken to improve the process. ITS also emphasized that their sofware suite is complex, spanning many areas of activity beyond academics and research. VP Khan also made clear that ITS is open to working with ITPC towards an improved process and made some specific suggestions for moving forward as noted in one of the Appendices.

ITPC recommends that next year's ITPC be charged with working with ITS to discuss a possibilities for move comprehensively to more transparent and streamlined process along with any further need for improved communication.

7. Backup of faculty computers: ITPC has been informed by ITS that it currently maintains both a system by which individual faculty can have a centralized build installed on their machines (including laptops) by ITS while maintaining administrator privileges so that they can also install their own software as needed, and a cloud backup system called "mybackup" available to all faculty for the cost of ~$100 / year. (Some technical details of this system are included in an appendix to this report.)

It is clear to ITPC that both of these systems are unknown to many faculty and thus

significantly underutilized. Thus again addressing the communications problem described above will certainly help to address this problem. However ITPC also believes that as Northeastern has become a Research 1 level institution with, as also described above, a very broad and heterogeneous level of research computing, and in the face of increased emphasis by funding agencies and others on data security and integrity and data sharing, we need a much more comprehensive approach to backup of faculty computers in which faculty are both provided a variety of levels of support and involved in a compelling program of comprehensive backup of all faculty and research computers. VP Khan expressed a willingness to work with ITPC and the Colleges to craft and implement such a plan, providing there is sufficient buy-in from the Colleges and faculty and that sufficient resources can be found to support this activity.

Thus ITPC recommends that next year's ITPC work with ITS and the Colleges to construct and propose such a plan and that after any needed refinement it be implemented by the beginning of the 2018-2019 academic year if not sooner.

8. Website support: ITS informed ITPC that it currently hosts 1200+ websites across all tiers of the university, including a majority of websites for faculty, centers, research groups etc. ITS support is currently focused on hosting and Wordpress infrastructure support, templates etc., while website development is currently handled by the website owner directly or through development agencies. ITS is building a team of internal web developers to be able to provide some development support, reporting to a director level position who has been brought on board to focus specifically on Northeastern's digital technologies. As with other topics on this list, this information was largely unknown by ITPC members, again reflecting the rather ubiquitous communications gap already described. ITPC believes that the implementation of the plan for improved communication between ITS and faculty is likely to significantly increase faculty knowledge about, and presumably use of, this service. This should allow a more realistic and meaningful assessment of whether it adequately meets faculty needs, and if not what improvements might be needed, by a future ITPC, either in spring 2018 or fall 2019.

9. Faculty awareness of best practices: A consistent theme in this year's ITPC discussions was the desire for faculty to have a better understanding of best IT faculty support practices among peer institutions, to thus be better able to evaluate what Northeastern ITS provides. Thus ITPC recommends that next year's ITPC be charged to work with ITS and other relevant administrative units to carry out a survey of faculty IT support at a relevant subset of peer institutions and report to the Senate on their findings.

Finally we want to repeat that VP Khan and Mr. Shridhar have been extremely positive about discussing and addressing faculty concerns and expressed interest and willingness towards working with ITPC on most of the recommendations and proposed initiatives above, so ITPC is optimistic that significant progress can me made on many of these fronts over the next year.

APPENDICES

A1. 2015-2016 Resolutions:

1. Grants management software:

BE IT RESOLVED That the Senate Agenda Committee be urged to work with the Provost's Office to establish a University-wide grant management working group, with membership drawn from principal investigators from each College, along with representatives from Information Technology Services (ITS) and the Office of Research Administration and Finance (ORAF), to be charged with evaluating and selecting a Principal Investigator(PI)-facing, real-time, post-award grant management system and other software tools to facilitate grant post-award management and compliance for faculty
investigators; and
BE IT ALSO RESOLVED That resources be provided to purchase and integrate these tools with Northeastern's current grant management systems and to distribute these tools
to and train all grant PIs and unit grant administrative personnel.

Approved 30-0-0

Provost response: Not approved, 9/11/16
"Committee far too specific. Collaboration underway. Grant mgmt. software critical."

2. Communication

BE IT RESOLVED That Northeastern ITS visit each college at least once per year to ascertain faculty concerns; to apprise faculty of the range of ITS software, services and
activities related to faculty research; to solicit suggestions for both software and services; and to identify unmet faculty IT needs; and
BE IT ALSO RESOLVED That a web directory of all available software tools be developed by Northeastern ITS, communicated to all faculty and staff, and maintained on at least a semi-annual basis.

Approved: 31-0-0

Informational, no action 6-20-16, Returned to Provost 8-30-16, Not approved 9/11/16
"First one is good. Second is too vague and could be problematic"

3. Faculty / ITS security committee

BE IT RESOLVED That the Office of the Provost establish a committee consisting of the cyber security research faculty at Northeastern University; and

BE IT ALSO RESOLVED That the director and staff of the NU Office of Information Security regularly meet with that committee in order to better secure Northeastern's information infrastructure and to better support cyber security research; and
BE IT ALSO RESOLVED That security policy decisions be made in consultation with this committee.

Approved: 31-0-1

Not approved. 6-20-16, "if the Senate wants such a committee, it should form it.

4. Software procurement process:

BE IT RESOLVED That Northeastern ITS provide a list of all software
being considered for procurement related to infrastructure, teaching or research, to ITPC on at least a semi-annual basis, and that ITPC be charged with reviewing these lists and providing recommendations to ITS.
Approved 31-0-0

Not approved, 9/11/16 "Makes sense on some projects, not others. Too all encompassing. ITS is working more closely with ITPC."

A2. Information on LMS status and plans:

1. Summary from VP Khan of outcome of LMS committee and draft report (from email from 24 Jan 2017):

"The main takeaways from the LMS report are as follows:

1. Recommendation to combine the two separate Blackboard LMS environments into a single LMS.
2. To move the combined LMS into a SaaS (software as a Service) model which enables quicker updates and feature enhancements.
3. After the combined LMS environment is in SaaS, begin moving to Blackboard Ultra i.e. their next version of BB."

2. Document provided to ITPC by VP Khan addressing many ITPC questions on Blackboard / LMS on 15 March 2017:

ITPC - Learning Management System Information

March 15, 2017

How many faculty use Blackboard -- what percentage do you estimate are active users of the

platform? Do you have any year-over-year trend numbers?
Enterprise Blackboard has had a 57% increase of active users over the last six years. Appendix 1 shows active students, instructors and TAs since 2010.
Note: These statistics are reflective of the enterprise Blackboard environment only. We have reached out to NUOnline for PAN/CPS and asked for reporting of their courses using the same criteria for accuracy. At the time of this response, the data for NUOnline usage statistics are not available.

What is the Blackboard usage by on-line classes vs on-campus?
Currently it is not possible to distinguish an on-line course from an on-campus course in Blackboard or in Banner. However, Information Technology Services (ITS) is aware of two exclusively on-line programs for which the usage statistics are called out in Appendix 1. NUOnline usage data are not available at the time of this response.

What is the usage for synchronous vs asynchronous courses?
It is difficult to define synchronous vs asynchronous courses but there are asynchronous and synchronous activities and applications used in both online and on-ground courses. Blackboard Collaborate is a good example of a synchronous activity in a course and Discussion Boards or Voicethread are a good example of asynchronous activity. Appendix 2 provides detailed statistics regarding these types of activities.

We would like to get specifics about costs and contract details. How long/how much/terms of service, etc.?
The costs of Blackboard are in line with those at other universities, measured based on our student population, size and usage. The contracts are reviewed and negotiated regularly with the best interest of the university in mind. Further efficiencies will result from merging the two current Blackboard instances (enterprise and CPS) into a single instance, planned for later this calendar year.

What other LMS options have been explored by ITS in recent years? Have there been conversations with other vendors?
With active participation from NU faculty, a working group was formed in 2015 and undertook an evaluation of LMS options, including other vendors. The attached document (LMSWorkingGroup_WhitePaper_DRAFT.pdf) encapsulates the work of the working group along with its recommendation.

Has ITS conducted any faculty surveys regarding Blackboard (or other platforms)? If so, and there are relevant results, we hope you might share them.

The LMS working group conducted a survey of the pilot users. In addition the results of extensive surveys by EDUCAUSE were incorporated in the recommendations of the LMS working group. The Educause documents are available at: Educause Students and Faculty Technology Study along with the Educause Current LMS Ecosystem.

Can we see a sample of support inquiries/complaints/service requests to ITS for help with Blackboard? We would like to get a sense of the requests fielded.

There is a searchable blog (https://www.ats.neu.edu/blog) created by Academic Technology Services (ATS) staff that provides quick tutorials on common issues. These blog posts come directly from support interactions with faculty members. In addition to fixing the issue, ATS staff usually create an accompanying video or instructions for future reference and post them on the blog. The data below describe the percentage time spent on categories of Blackboard issues with faculty:

Username/password/login issues **5%**
How to log in to myNEU to reach Blackboard, sponsored accounts, password resets, basic account

Gradebook/grading consultation issues **15%**
Late in the term, specifics of Gradebook calculation, weighting, and confirmation that calculations are correct, as well as questions early in the term about initial gradebook and assignment/test column setup

Assignment/paper/submission issues **10%**
How to collect student work and check submitted work, troubleshooting submission issues, verifying that work was submitted within Blackboard and in third party services such as Turnitin

Test creation/importing/exporting issues **10%**
Consultation instruction and training around online test creation, best practices and tools around online assessment, SCORM content, third party products such as Storyline.

Student activity logs/confirmations **10%**
Verification of student activity based on back-end logs, gradebook grade history, submission history, and assessment activity logs to validate student activity for instructors

TA enrollment issues and instruction **5%**
Instruction and assistance in adding TAs, guests, graders, etc that are not included in official Banner feeds. TA enrollment in Blackboard is currently a manual process, due to the lack of a per-CRN TA course role in Banner required for automation.

Content organization and copying **10%**
Instruction and consultation around course content setup, organization, and copying material from previous terms, particularly in the beginning of the term

Discussion Boards/Blogs/announcements/email **10%**
Issues, troubleshooting, and instruction around student content in courses including forum posts, blogs, wikis, journals, and communication within the course such as email and announcements

Course section merging **5%**
Merging sections is a manual activity for which we provide instruction and direct assistance in volume especially at the beginning of the term (Instructors with multiple sections often wish to teach using a single site in Blackboard)

External service integrations
(e.g. lecture capture, clicker integration) **10%**
Troubleshooting, instruction, consultation, and training around Tegrity Classroom lecture capture, Voicethread, TurningPoint clickers, and other academic technologies that integrate with the LMS Blackboard

Other **10%**
All other Blackboard related issues that are not included in the categories above, including technical questions, training, and specific faculty issues with specific students or content in Blackboard courses.

Can you connect us with the persons who are doing Blackboard support at Northeastern?

Blackboard Enterprise – ats@neu.edu
Christopher Carrillo
Assistant Director, Integrated Learning Systems
Academic Technology Services (ATS)
NU Information Technology Services
Phone: 617.373.7664
Cell: 617.575.9673

NUOnline Blackboard
Lauren S. Hankin
Associate Director, Technical Services
Northeastern University Online Experiential Learning
Phone: 617.373.7664

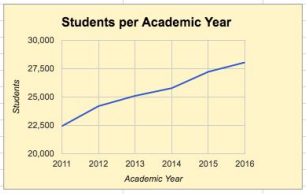
Finally, we'd like to know your professional opinion on Blackboard and how it is working for the NU faculty and student community. What's your general take these days?

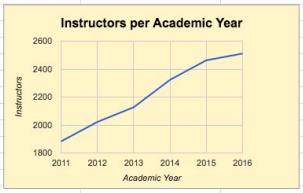
Over the last 4 years, Information Technology Services has worked to integrate more than 30 tools and services that have extended the functionality of the Blackboard creating more collaborative, engaging teaching and learning opportunities. The process by which tools integrate into Blackboard (using Blackboard as the platform) is secure and agile enabling the Learning Management Environment to transform, as technology and learning changes.

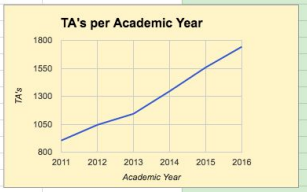
Blackboard has competition, but other vendor options pose their own challenges. Migrating 30,000 existing courses into a tool that does not function the same or have as many features could negatively impact faculty and students. As complex as Blackboard can be, it has the functionality that can handle multiple ways of accomplishing something and has proven useful to the creative faculty. The LMS landscape continues to evolve. We will continue to work with our faculty to understand the ever-changing requirements and at the same time research, evaluate and test new technologies to enhance teaching and learning in support of the Academic Plan.

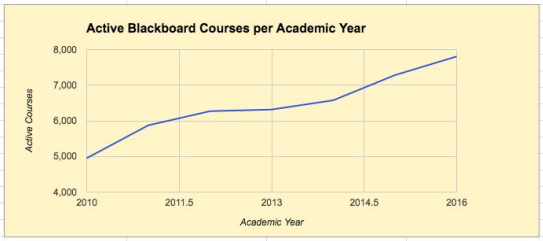
Appendix 1

ATS Service Usage Statistics	2010	2011	2012	2013	2014	2015	2016
Blackboard	Enterprise Users AY 2010	Enterprise Users AY 2011	Enterprise Users AY 2012	Enterprise Users AY 2013	Enterprise Users AY 2014	Enterprise Users AY 2015	Enterprise Users AY 2016
Students enrolled in active courses	*Unknown*	22,433	24,198	25,107	25,782	27,227	28,055
Faculty/Staff instructors of active courses	*Unknown*	1,883	2,022	2,127	2,323	2,463	2,511
Teaching Assistants in active courses	*Unknown*	904	1,044	1,143	1,345	1,558	1,743
	Active Courses* AY 2010	Active Courses* AY 2011	Active Courses* AY 2012	Active Courses* AY 2013	Active Courses* AY 2014	Active Courses* AY 2015	Active Courses* AY 2016
Total active courses containing posted content	4,951	5,874	6,270	6,316	6,576	7,282	7,805
Online Nursing Program (Orbis)	n/a	n/a	n/a	n/a	n/a	263	465
Online MBA Program (Pearson Embanet)	n/a	384	516	480	415	359	334









Appendix 2

ATS Service Usage Statistics	2014	2015	2016
Tegrity (lecture capture)	Recorded Lectures FY10 -FY14	Recorded Lectures Total	Recorded Lectures FY10 -FY14
	11985	16663	30577
	Number of Views FY10 -FY14	Number of Views Total	Number of Views FY10 -FY14
	463,896	502,269	812,756
Blackboard Collaborate (web conferencing)	Recordings	Recordings	Recordings
	2,399	3,709 (AY 2015)	2,641 (AY 2016)
	Session Attendees	Session Attendees	Session Attendees
	21,127	20,960 (AY 2015)	25,997 (AY 2016)
		Spring semester 2016 (one semester)	2/15/16 - 2/15/17 (one year)
TurningPoint (clickers)	Number of Devices		
		15 instructors	28 instructors
		1190 logged in	2346 students logged in during the period
	2012-2013 ResponseCards - 1,874	563 clickers	795 clickers
	2012-2013 ResponseWare - 425		
		Turning Point changed analytics methods and became a subscriptionas of spring semester so comparison periods are off.	
Digication		Total users: 10883	February 22 2016 - Feb 21 2017
			Total users: 14,000
		Total students 10517	Total students 13,473
		Total faculty 357	Total faculty 514
		Portfolios created in the last year 3,658	Portfolios created in the last year 4,069
	49,063 e-portfolio pages in 6 months previous to March 2015	Pages created in the last 12 months 181,551	Pages created in the last 12 months 113,254
	3.5% of eportfolio pages were created in eportfolios 6 months older or more		
		7.5% of updates occurred in a portfolio that was more than 6 months old.	
VoiceThread	2/9/2014 - 2/9/2015	2/9/2015 - 2/9/2016	9/1/2015 - 8/31/2016
	Usage in minutes: 205,380	Usage in minutes: 459,435	Usage in minutes: 478,845
	Daily average: 561.15	Daily average 1255.28	Daily average 1,308.32
	Voicethreads created: 662	Voicethreads created: 1517	Voicethreads created: 2,596
	daily average: 1.81	daily average: 4.14	daily average: 7.09
	All comment total: 8922	All comment total: 14,049	All comment total: 16,581
	Daily average 24.38	Daily average 38.39	Daily average 45.3
Top Hat	Fall 2014	Fall 2015	Fall 2016
	Students: 1223	Students: 1624	Students: 4295
	Courses: 12	Courses: 22	Courses: 69
			Instructors: 32

A3. Information and suggestions on software procurement process:

1. Suggestions from VP Khan (from email dated 24 Jan 2017)

"Research Computing software:
The research computing advisory committee (RCAC) co-chaired by faculty member (Paul Whitford) and ITS (Rajiv Shridhar) is one engagement venue where software for research use is discussed. Research faculty also contact the ITS research computing support team, led by Rajiv and Dr. Nilay Roy, when there is a specific need.

Teaching and Learning Software:
We are in the process of establishing a Teaching and Learning committee whose focus will be on academic technology, including classrooms, teaching software and tools. This committee seeks to have faculty members from each college along with academic support staff. Recommendations for software needs, requirements and purchases could be reviewed and initiated from here."

A4. Information on current status of backup service for individual computers:

1. From email from VP Khan on 24 Jan 2017):

"ITS currently provides a personal computer backup service for use by faculty and staff. Branded myBackup and based on the HP Connected Backup solution, this cloud-based service allows self-service backup and restore of unlimited amounts of data on the computer. Some of the key features of the Connected application are: (as stated previously) unlimited data backup, multiple versions and version history, full automation and ease of use, incremental backups and deduplication to minimize data transfer, mobile device support, and enterprise management and reporting, including eDiscovery.

The service is currently used by over 500 faculty and staff, many of whom are paid for by their departments or units. The service costs $108/year per computer. MyBackup can be installed and used on managed and non-managed computers alike, and supports both Microsoft Windows and Mac OS X.

As part of our constant review of existing and new service opportunities, we are reviewing this service to make it more accessible and financially more affordable, and several contenders are being considered."

2. From email from VP Khan on 15 March 2017:

- **who uses backup system (faculty vs staff, any other overall characterization of faculty users) and who pays (units / individuals / research personal funds))**

The initial rollout was to designated individuals, identified by Deans and other division/department heads. Those divisions/departments pay for their designees.
Currently the myBackup service is available for any faculty or staff member to use, payment is tied to a budget number which can be a unit budget or a research or other budget.
Any researcher can sign up for this service. The sign-up process includes an option where the budget number can be specified, along with the name of the budget administration (e.g. unit budget head, etc.).

- **what klnd of encryption is used?**

AES 128 encryption, both in transit and at rest. We are in the process of upgrading to a vendor solution that uses AES 256 encryption scheme.

- **does this service meat NIH / NSF requirements for data security and data sharing ability?**

The encryption schemes used in this solution are NIST standards, which NIH (e.g. NCBI for GDS policy) and NSF comply wit

A5. Information on current status of website support:

1. From email from VP Khan on 24 Jan 2017:

"TS provides no-cost support for hosting, infrastructure and templates (including supported templates) of websites to the entire university community, including 1200+ websites spanning the top-level university presence, colleges, departments, individual faculty, student groups, research groups, centers

and institutes. We partner with Marketing and Communications (MarCom) to provide guidelines and frameworks for websites in support of the university's brand strategy, and with the Office of the Provost, Enrollment Management and Student Life, the Professional Advancement Network, Advancement and Colleges to enhance the technology, processes, policies, guidelines and support for web and digital.

Some colleges also support individual web pages and support for their faculty. Over the past many years, web development support has been distributed across colleges and administrative units. Many website owners hire their own external developers to supplement their internal resources. However, we recognize that a standardized and sustainable, easy-to-access web development expertise is a gap. ITS is working with Marcom, the provost office, and EMSA to propose a new centralized service center which will act as a resource for web development and support to help faculty develop and maintain a web presence for themselves and their research groups. This is part of an overall focus on digital transformation towards our 2025 Vision."

2. Additional information from email from VP Khan on 15 Mar 2017:

"ITS is building a team of internal web developers to be able to provide some development support, reporting to a director level position who has been brought on board to focus specifically on Northeastern's digital technologies."

A6. User data from ITS on research computing, LMS/Blackboard, and myBackup: see attached PDF file.

RESEARCH COMPUTING			
DISCOVERY CLUSTER	**2016**	**2015**	**2014**
Total Physical HPC Cores Available	11236	5700	3840
Cores contributed by researchers through 'buy-in'	2268	1024	0
Total GPUs Available	48	16	0
Active HPC Users	622	406	154
Available Storage (usable)	1.47 PiB	0.5 PiB	0.45 PiB
Total CPU hours of Active Jobs (in past year)	422 million	82 million	35 million

Through our participation in shared systems grants, computing access is also available to Northeastern researchers on the Massachusetts Life Sciences Center-funded C3DDB cluster (for research associated with the life sciences), and on the Massachusetts Open Cloud environment. Interested researchers may contact Rajiv Shridhar, r.shridhar@northeastern.edu, to be approved for access.

LEARNING MANAGEMENT SYSTEM (Blackboard)			
	2016	**2015**	**2014**
Active Students	29,208	28,773	27,100
Active Faculty/Staff	2,782	3,253	3,079
Active Users (Total)	**31,990**	**32,026**	**30,179**
Active Courses per year (NOTE: Previous years' courses back to AY2010 are also available)	**7,805**	**7,282**	**6,198**
Tegrity Lecture Capture	**30,577**	**16,663**	**11,985**
Blackboard Collaborate Web Conferencing (recordings)	**2,641**	**3,709**	**2,399**
TurningPoint (clickers)	**28 faculty** **2,346 students** **795 clickers**	**15 faculty** **1,190 students** **564 clickers**	
Mobile Application Use	**37,319**	**35,768**	**26,812**

The Blackboard data above pertain to the enterprise instance of our learning management system. CPS and the Professional Advancement Network currently operate a separate instance (Blackboard Online). Plans are underway to merge the two instances into a single enterprise instance.

OTHER LEARNING TOOLS			
Digication	**2016**	**2015**	**2014**
E-Portfolio Pages	113,254	181,551	49,063
Active Users	14,000	10,883	
VoiceThread	**2016 (rep 8/31)**	**2015 (rep 2/9)**	
Usage in minutes	478,845	205,380	
VoiceThreads created	2,596	662	
Top Hat	**2016**	**2015**	**2014**
Active Users	4,295	1,624	1,223
Active Courses	69	22	12
Qualtrics (released 2016)	**2016**	**2015**	**2014**
Number of surveys	10,957		
Number of responses	179,524		

In addition, ITS is piloting several other tools that enhance the learning ecosystem, including Playposit and Zaption.

PERSONAL COMPUTING BACKUP			
myBackup	**2016**	**2015**	**2014**
Active Users	489	442	414

MyBackup offers personal computer backup protection in the cloud, with unlimited backups and self-service restores. As part of the initial rollout, departments and colleges nominated users to be part of this service. However, the service is directly available for all faculty and staff to enroll in using the ITS Service Catalog. The cost of this solution is $108/year/computer from the vendor (Connected).