The Engineering Technology Committee shall be responsible for reviewing and evaluating policies governing hardware, software, shops and computing services within the college, and for evaluating the effectiveness of the Engineering Technology Center as well as, for making appropriate recommendations regarding computer and technology resources to the Dean and the faculty.

During the fall of 2016 the EFC members had 2 in-person meetings to review the ETC charges, understand the services provided, and identify action items for each member to address with their respective departments.

<table>
<thead>
<tr>
<th>Meeting Date</th>
<th>Agenda</th>
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<tbody>
<tr>
<td>2016-10-27 (All EFC)</td>
<td>5 min (Faculty) Introductions of faculty to each other. 10 min (Tang) Provide Mr. Tang opportunity to discuss his vision as new CTO for engineering. What areas will continuity with historical practices be maintained. What areas have been identified as changing (either to improve environment, or in response to mandates). 10 min (Johnson) Review specific charges, and present expectations for meeting the charges of this committee. 15 min (Johnson) Lead discussion to identify tasks that need to be completed. 10 min (Johnson) Make assignments and timelines for completing the tasks</td>
</tr>
<tr>
<td>2016-11-09 (All EFC)</td>
<td>5 min Danny will provide a very brief overview of the draft content for Charge #1 “Develop and maintain a list enumerating technology services available to the college faculty”.</td>
</tr>
</tbody>
</table>
40min Danny will provide a 15-minute introduction to the OneIT (TIER) project and lead the discussion regarding college impact. The ETC faculty must identify how these changes will impact the COE.

We are charged with ensuring that IT services are compatible with the college expectations (Charge #4). We must identify ways to assist our local IT group with meeting the college mission.

<table>
<thead>
<tr>
<th>Date</th>
<th>Participants</th>
<th>Tasks</th>
</tr>
</thead>
</table>
| 2016-10-27 (ECE) | Danny Tang, Hans Johnson, ErWei Bai | 5 min (Johnson) Introductions  
5 min (Tang) Global overview of current technology, services & infrastructure provided by ECS  
15 min (Bai) Review ECE five-year plan for technology services, identify what is working, and what needs improvement with regards to technology services.  
5 min (Johnson) generate list of departmental priorities for the next year |
| 2016-12-05 (CEE) | Danny Tang, Hans Johnson, Ricardo Mantilla, Gutierrez, Michelle Scherer | 5 min (Johnson) Introductions  
5 min (Tang) Global overview of current technology, services & infrastructure provided by ECS  
15 min (Scherer) Review ECE five-year plan for technology services, identify what is working, and what needs improvement with regards to technology services.  
5 min (Johnson) generate list of departmental priorities for the next year |
| 2016-12-05 (MIE) | Danny Tang, Hans Johnson, Jia Lu, Ching-long Lin | 5 min (Johnson) Introductions  
5 min (Tang) Global overview of current technology, services & infrastructure provided by ECS  
15 min (Lin) Review ECE five-year plan for technology services, identify what is working, and what needs improvement with regards to technology services.  
5 min (Johnson) generate list of departmental priorities for the next year |
| 2016-12-07 (CBE) | Danny Tang, Hans Johnson, Eric Nuxoll, C. A. Guymon | 5 min (Johnson) Introductions  
5 min (Tang) Global overview of current technology, services & infrastructure provided by ECS  
15 min (Guymon) Review ECE five-year plan for technology services, identify what is working, and what needs improvement with regards to technology services.  
5 min (Johnson) generate list of departmental priorities for the next year |
| 2016-12-12 (BME) | Danny Tang, Hans Johnson, Michael Schnieders, Nicole Grosland | 5 min (Johnson) Introductions  
5 min (Tang) Global overview of current technology, services & infrastructure provided by ECS  
15 min (Grosland) Review ECE five-year plan for technology services, identify what is working, and what needs improvement with regards to technology services.  
5 min (Johnson) generate list of departmental priorities for the next year |

**Specific Charges**

1. Develop and maintain a list enumerating technology services available to college faculty, staff and students, including software packages, hardware platforms, network infrastructure, data stores, and IT services. This list is intended to describe resources available to the faculty and to set the scope of the committee's purview.

**Action Items:**
• (DONE) [[Tang]] Request from your team that preliminary reports be made to address this charge. If preliminary reports can be made soon, they may enhance our meetings with the DEO’s, and provide the ETC committee with valuable insight into the scope and breadth of services provided.

• (DONE) [[ETC]] Review this list of services and potentially identify unnecessary services, or redundant services. Provide “best practices” for taking advantage of these services.

• (Progress made, but necessarily ongoing) [[TANG|ETC]] Identify services that are critical to have in-house, and which services are commodity services that could be adequately served by ITS (Webhosting, digital signage, authentication, backup storage, cluster computing, etc…)

Results:
Danny Tang generated a draft list of IT services provided, a service area categorization, a description of the scale and impact of the service (department, college, campus, researchers), an indication of the ability to commoditize these services, and notes to better understand the use of the service. Additionally, a presentation accompanies the services list to aid in interpretation. Both the “ETC Services – Draft V2.xlsx” and the “Engineering IT Services Listing Introduction.pptx” are attachments to this report.

Services provided by EES and EMS are in process of being enumerated. Many of these services appear to also be offered elsewhere on campus, but through separate org units with no current formal responsibility to Engineering, and no central authority analogous to ITS. Additionally, the services provided by EES and EMS are currently not under the scrutiny of OneIT mandates, and therefore are less urgent to defend now. Unlike the IT list being generated, where it appears to be implied that all needed services are present and the focus is on reducing redundancy, there will always be desired services that would not appear on the EES, EMS list. These may be available through other org units, but there is no central resource for faculty to know what services are available elsewhere, nor how to access them.

The new ETC website, https://etc.engineering.uiowa.edu/ has been developed that documents technology services available to the College of Engineering. This includes IT, and Engineering services, as well as documentation regarding available software and hardware. The website will continue to be refined as services are added, removed or modified.

Costs for specific for fee services have not been published yet as the cost structure/models are being reviewed and modified, in partnership with the College of Engineering business office and the University Controller’s office. Once these new rates have been calculated and approved, they will be added to the website.

Regarding the action item for identifying critical in-house services, this bullet point will be addressed under Charge 4.

2 Develop and maintain a five-year technology plan to ensure excellent information technology infrastructure and services for the College. Specifically, enumerate the most pressing needs that need to be addressed in the next two years. This will help to establish the committee as an agency for advocacy at the central administration level and for prioritizing the diverse teaching and research needs of the faculty.

Action Items:
(In progress) [Tang] Continue to meet with faculty across the College and build a survey to solicit feedback on what future services might be necessary for the College. [Tang] ETC Review DEO meeting notes (see below) and generate framework for long range planning.

Results:
In consultation with DEO’s, Danny Tang is generating a survey for all faculty to identify current and future needs. This survey will be completed in April 2017, and distributed via each department’s DEO. A draft list of potential services has been identified for feedback:

Future Services being considered:
- Skype for business (Mac/Linux/)
- Technology Facilitation
- Activities and services more focused on enabling Research and Instruction
- Enhanced baseline support for research
- Applications that can reduce the overhead of enlarged class sizes and loads
- Electronic testing
- Autograding
- Predictive analytics for classes
- Enhanced web services
- Engineering tools training for graduate students

The needs of the faculty within the College are great and varied. From meeting with various faculty, the DEOs and ETC staff, some priorities have been identified for near term.

Greater Support for Teaching and Research
It has become obvious that top priority is to reorient resources towards supporting the faculty as they continue to absorb increased enrollment. One example of projects which have been initiated to accomplish this is the development and piloting of an electronic exam platform suitable for Engineering coursework. A successful midterm exam was carried out for ENGR:2730, with expanded testing of this system to follow during the summer of 2017 offering of ENGR:2730 with distance learners. Additionally, the CTO has been added to a campus committee evaluating online proctoring and examination services.

A proposal has also been submitted to outfit a 90-seat classroom in the new Annex with workstations. This space can serve as an expanded CAD teaching space, which would be an improvement over the current 45 seat room. It is also a potential electronic exam facility until the University builds one on campus.

It is also the CTO’s observation, that the ETC is severely underinvested in application development resources. Software tools can be developed for TA scheduling, electronic exams, the promotion and tenure process, frontends for course analytics, etc., which would be of great value to the College. More effort should be made to either develop new or reallocate existing staff to this critical area.

As the College begins the refocus on research production, more ETC resources should also be invested in supporting the research mission. The CTO has been in discussions with Ben
Rogers at ITS to host more training sessions within the College of Engineering for HPC. Also, as more and more staff resources are freed up from the completion of OneIT projects, those resources should be directed more towards research support.

In theory, OneIT and TIER should be freeing up local resources to invest in the above. Opportunities and concerns regarding this will be addressed under Charge 4.

**Machine Shop Productivity**

A critical bottleneck has been identified within the Engineering Machine Shop. During peak periods, the backlog of jobs can be over a month. Much of this can be attributed to walk-in consultations, which conflicts with staff time necessary for actual fabrication. The CTO has been in discussions with Machine Shops to implement an office hours / consultation-by-appointment system to free up staff time for fabrication. This new system must be balanced with maintaining availability for consultation.

The CTO has been allowed to hire an additional Engineer for the Engineering Machine Shop. However, this position must be paid for out of cost recovery funds, and not GEF. Analysis is currently being conducted on whether the additional cost is sustainable long term. This concern is further exacerbated by a recent decision from College Administration to transfer 25% of salary costs at the Electronic and Machine Shops from GEF to cost recovery funds.

**Other Priorities:**

*Department Websites* – It is clear from conversations, that many departments are not satisfied with their websites after the recent redesign. While the College website has been well received, the department sites are considered lacking. A new project with ITS has been initiated to develop a single custom theme for all the department sites, based on the College website.

*Dissatisfaction with OneDrive* – many DEOs and faculty have noted that OneDrive does not meet their needs for cloud storage or collaborations. Many have opted to use other services such as Google Drive or Dropbox. The CTO has presented this feedback to the OneIT Operations team, and a decision has been made to evaluate Google Apps (GSuite) as an enterprise offering to campus. An additional project is underway to evaluate Kumo, a product developed at Indiana University, which unifies many common cloud storage options under a single mapped drive.

*Additional Student Bench and Maker Spaces* – The current plan is for the Engineering Machine shop to convert G449 in to a space for expanded 3D fabrication and student bench spaces. As of the writing of this document, the room has not been vacated by its current occupant.

*Large Format Printing* – At the time of the DEO meetings, each department runs their own poster printer. Some DEOs had requested that ECS provide poster printing as a service. ECS purchased a poster printer in March 2017, in time for research open house. Thus far 80+ posters have been printed, at the provisional rate of $15/poster. Departments are free to continue to provide their own services, however, some have expressed desire to retire their own printers in favor of using ECS.
Meet with the DEO of each Department to review current technology, services and infrastructure and review the five-year plan and list of priorities for the next year. This will ensure that the needs of the departments are specifically recognized in the committee's planning and advocacy.

Action Items:
- [[Johnson|Tang] Meet with ECE
- [[Johnson|Tang|Schnieders] Meet with BME
- [[Johnson|Tang|Nuxoll] Meet with CBE
- [[Johnson|Tang|Mantilla] Meet with CEE
- [Johnson|Tang|Lu] Meet with MIE

Results:
Prof. Johnson and Mr. Tang met with each DEO and the ETC representative from that department to discuss the various computer and other engineering technologies provided by the College. Generally, the DEOs were satisfied with the services provided by Engineering Computer Services and the Engineering Technology Centers. An appreciation for the staff’s dedication and commitment to the college mission were a common theme, even when describing shortcomings that had been encountered. The conversations suggested that the systems and services provided in support of their academic missions are functioning adequately, and the general tone was of need for refinements or improvements to existing systems.

DEO Meeting notes:

ECE DEO Meeting (prepared by Prof. Johnson):

Prof. Bai, Prof. Johnson, and Mr. Tang met on 10/27/2016 and discussed the needs of the ECE department with regards to ETC charges. Mr. Tang indicated that we are currently undergoing an IT audit by the university, and that interactions with OneIT continue. There is concern about the burden of OneIT coordination taking away from the ability to respond quickly.

After initial introduction and summary of meeting expectations, Prof. Bai made comments regarding interactions with ECS staff.

1) Prof. Bai noted that the ECS staff are very supportive of ECE needs. This is very much appreciated and is critical for our teaching ability to stay current with technology.
2) Prof. Bai noted that the Electronics Shop plays a key role in many courses. Faculty rely on the shop for student fabrication, prototypes, and now 3D printing.
3) A discussion about the need for rapid response to class needs is particularly important for the new faculty lines, development of new courses (i.e. Internet of Things) to accommodate our growing department, and as part of the new Computer Science in Engineering degree.
4) Prof. Bai indicated the need for temporary (1-2 days) network access for guests that may visit for a few days. This needs to be an easy process to gain this access.
5) Mechanisms to assist with autograding/ test exam question preparation, content generation would be a new service that would be beneficial to the faculty in addressing the increased student/teacher ratios as the college grows.
6) There is a need for a “Maker” space for students to assemble/disassemble computers.
7) There is a need to continue to support “bleeding edge research”
8) Mr. Tang asked that his group be an integral part of new faculty onboarding process.
Notes of Meeting with CEE DEO Michelle Scherer:

The meeting included Prof. Johnson, chair of ETC, Mr. Danny Tang, and CEE representative Prof. Mantilla. After introductions, Prof. Scherer was informed of the major tasks advanced by the committee and Mr. Tang in his new role as Chief Technology Officer, Engineering Technology Center. Included the new compiled and classified list of services provided by the ETC. **The first major point of discussion** was the centralization of "customer service" with Prof. Scherer **advocating strongly for a decentralized customer service system.** In particular Prof. Scherer highlighted that personal and close relationships between the faculty and the ETC staff make it possible to maintain the dynamic and flexible cyber-infrastructure that supports the engineering classroom environments and support for student organizations. Although, most research is supported by university services, ETC provides a flexible and efficient platform for testing new tools and implementations that can be then transferred to university resources, including HPC and storage. **The second major item of discussion was the issue of storage.** Prof. Scherer pointed out to her use of Dropbox as an easy to use resource, accessible and dynamic. In particular, to the ability of selecting who can see the content of a specific folder. Mr. Tang submitted that other universities have contract to provide BOX, a business oriented counterpart of Dropbox. **The third point that was addressed** was a mechanism to get more direct feedback from faculty. Mr. Tang indicated that he has been working on a survey that will be reviewed, modified and distributed to faculty directly by Michelle to maximize the response.

MIE DEO Meeting (Prepared by Prof. Lu)

The meeting took place on Monday, December 5, 2016. Participants included MIE CEO Ching-Long Lin, ETC Chair Danny Tang, MIE representative Jia Lu, and ETC committee chair Hans Johnson. At the beginning, Professor Lin shared his evaluations on the priorities of a list services compiled by ETC. Professor Lin first discussed the need of lab support for Design For Manufacturing (DFM). The DFM labs are scheduled during regular hours. Towards the end of semester, the department keeps the lab open for longer hours or in weekends, to accommodate the large number of students rushing to finish projects. The lab does get support from EMS, but it is limited to their working hours and subjected to their availability. The MIE would like to work out a formal arrangement with ETC. Second, Professor Lin raised a concern about the newly designed departmental website. The website is poorly designed. Some of the pictures are disproportionally sized and some of the contents are irrelevant to the department. The most significant issue is a lack of necessary flexibility for the department to quickly to edit or modify the website. Mr. Tang indicated that the departmental websites in the college were produced using a standard template, which doesn't have the level of flexibility desired by the department. An improvement to the websites would likely involve initiatives at the college level. Another issue that was touched upon during the meeting related to purchasing computers. In the past, this service was provided locally within the college, and ETC was able to respond very quickly. Now the service has been centralized, and the workflow tends to be much longer. In addition, Professor Lin stressed the importance of acquiring software licenses for classes. A suggestion was made that ETC regularly circulates a
questionnaire on software needs. Lastly, Professor Lin hope that ETC can help on remodeling MIE TA room, G130.

**CBE DEO Meeting (Prepared by Prof. Nuxoll)**

CBE DEO Allan Guymon indicated two technology issues for discussion at this meeting. The primary issue concerned the CBE website. The website was already objectively quite bad, and the recent redesign made it much worse. The timing of this change was also particularly bad, as the CBE Department was temporarily short-staffed due to TIER reorganization and it was near the peak of the recruiting season. Guymon summarized the recent difficulties CBE has had regarding the website, noting a lack of responsivity from ETC and an inability for CBE to implement changes themselves. This contrasted his discussion of the website support CBE wants from ETC. From a technical standpoint, the department should have direct access to the website for quick updates and edits, as well as a resource in ETC who can advise and assist when necessary. Guymon primarily stressed the importance of having ETC resources to help cultivate content from the faculty and students and present it online in an appealing way. An example in the discussion was having someone with a responsibility to profile a few faculty, students, or alumni each quarter. Some of these needs may overlap into the responsibilities of other College offices such as External Relations, so a broader discussion is needed.

The other issue raised by CBE was poster printing. The CBE poster printer recently failed, and the department is considering its options for future poster printing. ETC raised the prospect of having CBE outsource their poster printing to ETC, but the preliminary cost suggestion was grossly uncompetitive. Centralized poster printing is attractive to CBE, but the expectation is that this should reduce overall costs rather than increase them, and details regarding implementation would need to be worked out.

**BME DEO Meeting (Prepared by Prof. Schnieders)**

BME DEO Nicole Grosland met with Danny Tang and Profs. Johnson and Schnieders on 12/12/2016 from 1:30pm to 2:15pm to discuss engineering technology needs. DEO Grosland presented feedback collected from the BME faculty, which included:

1. An inquiry on the possibility of a site license for DropBox and/or Box as an alternative to OneDrive.
2. A discussion of the move to host websites via a cloud provider, which may cause a loss of flexibility for sites with heavier compute needs.
3. An inquiry on the possibility of updating classroom laptops to accommodate the demands of advanced modeling software (i.e. CREO)
4. An inquiry on the possibility of streaming lectures between classrooms, to provide flexibility as BME class sizes have grown.
5. A discussion of the College of Engineering continuing to run its own computer network, which led to feedback from Danny Tang that ITS costs are still too high and lack some needed functionality at this point.
6. A brief discussion of the advantages of VDI (CoE Virtual Windows Desktop) compared to Citrix, with the consensus that VDI is preferred.

A prolonged discussion stressed the importance and value of the electronics shop and machine shop for BME student projects – especially for BME senior design. Finally, we discussed the importance of College of Engineering IT members who help to update and maintain software for desktops computers (I.e. loading software specific to the College of Engineering, such as CREO or programming environments). Overall, the hope of the BME Dept is that the nimbleness and responsiveness of Engineering IT can be maintained as OneIT is implemented.
Monitor the University of Iowa’s OneIT Tier process to ensure that IT services are consistent with the College expectations.

Action Items:

- (Ongoing) [TANG|ETC] Identify what initiatives in OneIT will impact college of engineering. (Get rid college level of data centers, move all end-user support to ITS, centralize authentication)
- (Ongoing) [ETC|DEO|Faculty] Provide narratives for key IT features that need to be supported in house. Identify where comprise can be made without impactful negative consequences
- (Ongoing) [ETC|DEO|Faculty] Identify a co-existence with OneIT where the COE benefits from the resources available, and augments those centralized resources with customizations necessary to achieve our missions.

Results:

**Influence/Governance:**

The CTO has spent much of the past few months actively increasing the College of Engineering’s influence as OneIT begins to form. Within the framework of the new IT Governance model being developed by the CIO, Engineering is well represented. Notably, Keri Hornbuckle chairs the Teach and Learning Council and Milan Sonka chairs the Research Council. Operationally, the CTO is one of three Collegiate IT Directors on the OneIT Operations Team and is also a member of the Infrastructure/Architecture Council. Various ETC staff are also members of other OneIT project committees. Our participation is yielding dividends in making sure that the College’s needs are being heard. However, this is an ongoing effort and much work needs to be done.

**Services:**

**End User Support:** One notable OneIT project expected to have significant impact on the College of Engineering is the End User Support Project. This is the centralization of all desktop support staff into a central service from ITS. After extensive discussions with Steve Fleagle, other ITS directors and Collegiate IT Directors, it is highly unlikely that Engineering will be exempt from this project. While there is consensus from all parties that this project is not ideal, this project is also explicitly stated as a deliverable to the Board of Regents. The College of Engineering is slated to begin implementation by Fall 2017. The most likely outcome is that one of ECS’ staff will be transferred to ITS as a part of this service. Currently, the CTO is in discussions to minimize impacts to Engineering. It is likely that this staff person will remain geographically located within Seamans Center and assigned to Engineering. There is also potential for other End User Support staff to be based within Seamans Center, which may yield ancillary benefits for Engineering. The CTO is also attempting to make that case that a separate desktop support group can be formed specifically focused on Collegiate support.

If this staff change does take place, the CTO has also been in discussions with College Administration to create a new positioned specifically focused on Educational and Instructional Technology support, in keeping with the priorities identified in Charge 2.

**Device Management:** A related project to End User Support, is the campus standardization of tools to manage computer devices (computers, laptops, workstations, etc.) While this is not
immediately visible to end users, how this project is implemented can have a significant impact for the College. It is possible that the result can severely limit ECS staff, in their ability to manage computers within the College. ECS is represented in the committee for this project and is heavily engaged. The project is still ongoing.

“Commodity” Services: ECS currently provides a pair of critical services which can be considered “commodity” or “utility” services from a high level: networking and data center services. The intent of OneIT is to consolidate these services across campus. The opinion of the CTO is that this represents both significant opportunity and risks. Significant ECS staff time and monetary cost is devoted to the maintenance of these services. The potential gains from offloading these services to a commodity provider such as ITS and reallocating resources to the Teaching and Research missions is significant. However, ECS currently runs these services locally, because the ITS offerings are severely lacking key service attributes, especially in regard to networking. The CTO and ECS will actively work with ITS within the OneIT framework to ensure that ITS can provide these services to meeting Engineering’s needs before exploring the possibility of service hand off.

5 Recommend specific charges for the 2017-2018 Engineering Technology Committee.

Action Items:
[ETC|Johnson|Tang] Create a list of specific charges for the AY17-18 ETC committee

Results:

PRELIMINARY RECOMMENDATIONS FOR AY2017-2018 ETC: In response to the changes in the structure of IT services within the college and at the university, we recommend that the standing committee general charge be modified as follows:

The Engineering Technology Committee shall be responsible for prioritizing information technology needs for the college related to education and teaching, reviewing and evaluating policies governing hardware, software, shops and computing services within the college, evaluating the effectiveness of the Engineering Technology Center and technology infrastructure used by the college, and advocating for information technology needs to the university.

Further, we recommend the following specific charges:

1. Meet with the DEO of each Department to review current technology, services and infrastructure and review the 5-year plan and list of priorities for the next year. This will ensure that the needs of the departments are specifically recognized in the committee's planning and advocacy.
2. Investigate ETC staffing and services for further opportunities to better support the Research missions.
3. Investigate ETC staffing and services for further opportunities to better support the Teaching missions.
4. Monitor the University of Iowa’s OneIT Tier process to ensure that IT services are consistent with the College expectations.

6 Submit an interim report by December 15, 2016 and a final report by April 1, 2017.

Action Items:
[Johnson] Prepare an interim report for EFC to review.

Results:
Interactions with each department was initiated, and preliminary feedback related to ETC related IT, EES, and EMS performance was gathered. This document is the preliminary report for the actions taken by the ETC in Fall of 2016.