

IT@Cornell: Planning Our Future, Together

A Review of the Cornell Community's Conversation About IT September 11, 2012

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Background:

Cornell has undertaken to develop an IT strategic plan that will set forth a broad campus vision for information technology over the next five years (2012-2017). Strategic priorities identified in the plan will guide capital and operating budget priorities, technology directions, and will also inform professional and career development plans for IT staff. As one part of securing the broadest possible input of the Cornell community, Ted Dodds, CIO instituted a one-day community conversation about the future of IT at Cornell. Both in material published in advance of the day and in his introduction to the day, Dodds made it clear that the day was the first incidence of the conversation that would continue over the months and years to come by a variety of means including the possibility of making the one-day event annual.

The author of this report was asked to set the stage for the process, review important points from the two keynote presentations before participant breakout sessions, conclude the day with a presentation on what had been said, and develop this report.

300 some people from staff, faculty, and administration gathered on September 11th. Following the keynote presentations those in attendance participated in 30 some 45-minute breakout sessions on the following topics:

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|---------------------------|--|-----------------------------|
| 1. Administrative Systems | 2. Adoption of Learning Technologies | 3. Classroom Technologies |
| 4. Mobile Technologies | 5. Massive Open Online Courses - MOOCs | 6. New Faculty Expectations |
| 7. Research Computing | 8. Students Expectations | 9. Technology Support |

This report concludes with more detailed notes of feedback from each of those sessions.

A Digest of What the Community Had to Say:

Throughout the afternoon, participants seriously engaged the issues presented to them in an extremely enthusiastic and positive manner. Even when the message was focused on weaknesses or lacks in current capacity, the message was delivered constructively. People were clearly choosing to engage in the conversation in a spirit of making things better.

The Cornell community's message could be summed up in several key words: **Collaboration, Data, Tools, Reach, Planning, Consistency, Support**. Each of these words is inextricably linked to the others. No discussion of one can occur without use of all or most of the others.

Collaboration: In every topic addressed collaboration emerged as a strong theme. Researchers made it clear that their work involves **collaboration** across the country and around the world. They need access to the **tools** that will allow them to **collaborate** effectively - including being able to share large **data** sets. Administrative staff spoke of the need for greater **collaboration** across business units in the selection and use of IT based productivity **tools**. Faculty spoke of the need for **collaborative** technologies in the classroom that enabled the use of social media and enabled interactive experiences via user owned devices such as smart phones and tablets. Clearly a guiding principle for IT direction at Cornell is new processes, technologies, and applications must support a **collaborative** approach to work in research, learning, and business processes. It is also a clear principle that that support for collaboration must reach well beyond Cornell. Members of the Cornell community are collaborating with the world. Currently available **tools** are often an impediment to furthering that collaboration. It follows that interoperability must be a requirement for technologies and applications adopted at Cornell.

Data: Again in multiple discussion groups, **data** emerged as a major concern. Administrative staff spoke of the problems with **data** access to do their work efficiently. Researchers spoke of their concerns about data acquisition, development of meta-data, storage, archiving, security, and curation. Researchers were equally concerned about capacity to share large data sets with **collaborators** around the world. Current **tools** including email and box are simply not up to the demands of research in a big **data** world. One research group spoke of a need to move 40TB per day to support collaboration. Faculty spoke of a need to store learning objects and to develop a directory of those objects and **tools** to monitor their use and effectiveness - again fundamentally a big data challenge. All spoke of the need for access to **data** on multiple mobile devices in the classroom, in the laboratory, in the business office, and around the world. A key principle for

IT at Cornell must be to implement technologies and applications that enable the free exchange of big **data** within all the appropriate security parameters.

Big **data** also creates big demand for **support** and training in its use. Just because researchers are generating enormous **data** sets is not an indication that they have appropriate expertise on how to deal with that **data**. Demands from funding agencies are increasing for stewardship of **data**. Privacy concerns expressed in rules such as HIPAA require increasingly sophisticated **data** management. Effective training and **support** to equip the Cornell community to interact with and manage big **data** should be key principle of the IT plan for the university.

Tools: One might be forgiven for saying, well, of course, **tools** are required. But again, the emphasis on easy to use, **supported tools** was pervasive across the groups. Many, from all kinds of roles, emphasized the willingness to use **tools** if they were made aware of those **tools**, clearly understood the business/use case for their deployment, and if the appropriate levels of **support** were available. Multiple voices expressed the belief that members of the Cornell community from all roles would not proactively search out **tools**. Disinclination to search out **tools** came from preoccupation with current work rather than indifference. If **tools** were drawn to their attention – not just in a directory but in an annotated catalogue that documented both evaluation and benefit; if training and **support** in their use was available; and if the infrastructure to support those **tools** was solid, adoption of new IT based **tools** would be enhanced. **Support** for the sourcing, evaluation, deployment of new tools/applications should be a key principle of IT at Cornell.

Reach: Given that participants selected in which break-out groups they would participate, the organizers were, perhaps, most surprised by the demand to participate in discussion of mobile technologies. None of the nine breakout topics was more subscribed than mobile technologies. The discussions made clear that the **reach** of Cornell IT solutions had to be highly mobile – wirelessly available across campus and around the world. A clear priority that emerged was closing the wireless gap. All of Cornell needs robust, reliable WIFI. Closely related to the emphasis on **collaboration**, the groups emphasized that mobile solutions/**tools** that enabled interaction with Cornell's research, learning, and business processes anytime, anywhere were critical. The Cornell community is highly mobile around the university, the state, the country, and the world. Cornell in all its services must be available where they are, when they are. All applications introduced at Cornell should be evaluated on their "mobile" compatibility. Similarly any **tools** and applications must enable **reach** to **collaborators** around the

world. Such **reach** must enable access to and capacity to share big **data**. Mobile-enabled is a key principle for IT innovation at Cornell.

Planning: Many groups called for long-term planning for IT at Cornell. There was strong recognition that everything cannot be done at once. But many expressed the opinion that if a **plan** were in place to move towards the realization of key principles for IT at Cornell that people could understand and observe progress, there would be strong buy in. Such a **plan** should be comprehensive. It should not simply be about the acquisition of equipment or applications. It should include **planning** for training, support, and deployment as widely across the university as is appropriate. A comprehensive IT strategic **plan** with regularly updated implementation schedules should be a key principle of IT at Cornell.

Consistency: Administrative staff called for **consistent** use of applications across business units at Cornell. Teaching faculty called for **consistent** availability of learning technologies in classrooms with a **consistent** interface. Researchers called for **consistent** availability of means with dealing with big data and ways of meeting research grant reporting requirements. Everyone called for **consistent** availability of WIFI and mobile enabled solutions. Everyone also called for **consistently** available support for IT innovation. A number called for a **consistent** brand across Cornell's websites. It is important to note that the call for **consistency** was made to enable efficiency, streamline operations, facilitate adoption of new solutions. Each call for **consistency** was accompanied by recognition that there would be units around the university that would have specialized needs that would require additional or different services. But at present, lacking a **plan**, there is a dysfunctional level of diversity in equipment, applications, and processes across the university. IT at Cornell should have a **consistent** feel and the people of Cornell should be able to count on **consistent** availability of tools and services both on campus and around the world. A key principle of IT at Cornell should be **consistent** implementation of IT equipment and applications across the university.

Support:

No word was used more throughout the breakout sessions than **support**. Participants spoke in the following ways of the need for **support**:

- in the identification and sourcing of tools and applications
- in the use of applications from local expert resources.
- in dealing with big data.
- for user owned devices.
- in the use of learning and research technologies.

- in finding and understanding resources that are available on campus.

A principle for IT at Cornell should be that **support** is fully integrated into the IT **Plan**. New technologies and applications should be accompanied with appropriate ongoing **support**. Support should be provided locally although online support resources should also be deployed. **Support** need not always be provided by dedicated staff. A network of expert users at Cornell would be enormously helpful in extending the **reach** of effective **support** to IT users.

The conversation begun on September 11th was serious, spirited, and committed to improvement. Out of that conversation, 10 key aspirational principles for IT at Cornell might be suggested.

Ten Key Principles for IT at Cornell

1. New processes, technologies, and applications will support a **collaborative** approach to work in research, learning, and business processes.
2. Cornell IT recognizes that **collaboration** extends well beyond Cornell campuses to people and organizations around the world.
3. Cornell will deploy technologies and applications that enable the free exchange of big **data** within all the appropriate security parameters.
4. IT at Cornell will include effective training and **support** to equip the Cornell community to interact with and manage big **data**.
5. **Support** will be in place for the sourcing, evaluation, deployment of new tools/applications at Cornell.
6. All applications will be mobile-enabled to extend **reach**.
7. Cornell will have **consistent** implementation of IT equipment and applications across the university.
8. **Support** is fully integrated into the IT Plan at Cornell.
9. Cornell will have an IT strategic **plan** with regularly updated implementation schedules.
10. Ongoing IT **planning** at Cornell will be informed by ongoing dialogue with the entire Cornell community.

IT@Cornell: Planning Our Future, Together

The Keynotes

The day began with two keynote speakers to set the stage for the conversation the Cornell community would have in planning the future of IT at the university.

Shelton Waggener, Senior Vice President at Internet 2 Net+ gave a presentation entitled ***Months to Minutes – Reinventing Higher Ed for Webscale and Webspeed***. Waggener's thesis revolved around a variety of factors that will either transform higher education or run over higher education. Those factors include technology leaps, funding models and the supply chain, globalization, and pedagogy and the online world. All of these factors combine to place both enormous pressure on higher education to change and enormous opportunity for changed higher education institutions to flourish. Scale and speed are the two great differentiators that will distinguish those institutions that flourish and those that flail. Technology leaps give institutions a reach well beyond their traditional markets and geographies. Many of those same technologies facilitate an agility to readjust offerings and other services at a speed unknown in traditional institutions. All of those technologies are IT based and include the web, cloud computing, mobile technologies, and continual and rapid application development and deployment. Perhaps the most transformative aspect of these technologies is the way they enable personal empowerment that completely changes the individuals relationship with potential service providers. Waggener concluded his presentation outlining Net+ and the way it is enabling the transformation of it higher education members across the United States.

Diana Oblinger, President and CEO of Educause gave a presentation entitled ***IT and Education: Game Changers***. In keeping with Waggener's message about personal empowerment, Oblinger's message focused on a variety of game changing developments in education that use technology to give the learner maximum choice. At no time has the demand for tertiary education been higher, but that very demand is producing very different models of delivery and very different expectations of education institutions. Oblinger focused on a number of examples of very successful technology assisted tertiary education initiatives that are transforming the way many learners access opportunities. Oblinger suggested that by 2020 there will be a focus on outcomes rather than credits, degrees will be competency-based,

there will be do-it-yourself learners who will significantly choose their own mix of learning experiences, and that residential campus experience will be too costly for many. Oblinger acknowledged that much of what she outlined may have lesser application for Cornell, but that it would be difficult to imagine that Cornell should not be attuned to major changes in tertiary education that are already underway.

Both presentations are available:

Videos:

<http://cit.webcast.video.cornell.edu/Mediasite/Catalog/Full/c14c74886b4d45778abde5b631e3015b21/?state=Kq15tyEp39IRyNCHxUuQ>

Slides:

Waggener:

<https://internet2.box.com/s/6bio9c6o7fplazyb2kb0>

Oblinger:

<http://www.it.cornell.edu/catc/cms/cio/strategic/loader.cfm?csModule=security/getfile&PageID=228830>

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The Breakout Sessions

Throughout the afternoon of Tuesday, September 11th participants at IT@Cornell were involved in 30, 45-minute breakout sessions organized in three blocks around the following topics:

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|---------------------------|--|-----------------------------|
| 1. Administrative Systems | 2. Adoption of Learning Technologies | 3. Classroom Technologies |
| 4. Mobile Technologies | 5. MOOCs – Massive Open Online Courses | 6. New Faculty Expectations |
| 7. Research Computing | 8. Student Expectations | 9. Technology Support |

Participants pre-selected the breakout sessions they wished to attend. Some topics had multiple sessions across the entire afternoon. Only MOOCs had a single breakout session.

Key Findings from the Breakout Sessions:

Administrative Systems:

What are the most important improvements we could make to our administrative systems? What technology do you need to be more effective as a staff member?

- Established workflows aligned to business processes are required.
- Collaboration tools are essential and currently lacking.
- Strategic objectives and long-term planning for business systems are required.
- Users need to be engaged in the design of systems.
- Access to data is needlessly hindered by the current security model. Those who need access to data to do their job need to have that access facilitated. Granular access to data appropriate to need should be available; i.e. access to the level of data appropriate for the task.
- How data is created, stored, managed, preserved is not clear to most employees.

- Service level agreements need to be achievable and clear.
- Business applications should be deployed as widely as possible across the university with campus-wide licences. – currently there are too many different systems.
- Commercial applications with training and support should be deployed where possible.
- A standard document management system is necessary.
- Cloud solutions for administrative processes should be investigated and deployed – “Why do we own so much?”
- Better tools:
 - Calendaring, email (need confidence that what I send is what the recipient will see)
- Users require more support and more training.
- All applications should be mobile enabled.
- All Cornell websites should have consistent layout and navigation.

Adoption of Learning Technologies:

What technologies do you feel would make you more effective in teaching, research, and outreach?

- All efforts in learning technologies need to be predicated on the internet as the base platform – stand-alone, device/location specific technologies will not work. Learning technologies that incorporate or can be incorporated with social media will be more useful.
- Learning technologies must be mobile and must be adapted for use on user-owned devices.
- Ubiquitous, reliable WIFI is required.
- Strong need for a directory/clearing house on what learning technologies are available. A unit that researches and evaluates technologies and makes recommendations for deployment would be extremely helpful. A simple catalogue is of no help. Faculty have neither the time nor the predilection to go searching for new technologies – especially with little expectation of support.
- Guidance and support – preferably from people who have used the technologies is required including assistance in modification of existing courses to include learning technologies.
- While training is important, local on-going support is critical.
- Cornell needs to share learning technologies and the experience of using learning technologies across departments and faculties.
- Tools to create and manage learning objects are required.
- Tools to analyze the use of learning objects are required.
- Tools to develop metrics on the effectiveness of learning technologies are required.

- Clear business cases are required for the adoption of learning technologies.
- Applications must be rock solid.

Classroom Technologies:

What do you envision as the future of classroom technologies? What type of consistency should there be for classroom technologies?

- Classroom technologies must enable user owned devices. Ubiquitous reliable WIFI is key.
- Effortless, automatic connection to the network and to AV devices is required.
- Interactive solutions with user owned devices should be available; for example, in large enrolment classes polling via smart phone.
- Strong call for a standardized interface with technology in the classroom. There is too much variety at present. What works in one classroom may not work in another.
- Classroom technologies need to be supported university-wide.
- Fear of technology failure and malfunction, based on experience, greatly retards the adoption of classroom technologies.
- Cornell is behind many other schools including some high-schools.
- While standard classroom technologies across the university would be extremely valuable, a "lending-library" for specialized, perhaps novel, technologies would be very useful.
- Guidance about what could be available and support in its use is critical.

Mobile Technologies:

How can Cornell make the best use of mobile technologies? How should new apps be created and approved on campus?

- The need for enabling mobile technologies at Cornell strongly embraced.
- Adoption of mobile solutions is critical – Cornell is behind.
- IT support for user owned devices is critical to deploying mobile technologies.
- A Mobile Centre of Excellence would be valuable – a centre where mobile solutions are researched and evaluated – a centre that could provide user support. The Mobile Centre of excellence could also operate an apps exchange for user developed apps at Cornell.
- Cornell needs a plan for mobile – a plan that clearly articulates business reason and expected services and expected gains.

- Mobile solutions must be agile and continually updated.
- Mobile devices should be used to make classrooms interactive – smart phones are better than clickers.
- Ubiquitous, reliable WIFI is essential.
- Cornell has a highly mobile workforce – Cornell on the road is essential. Cornell people on the road want to carry tablets and smart phones, not laptops.
- All new apps at Cornell should be mobile compatible.
- Current apps are not all mobile friendly; for example, People Soft.
- Mobile apps should carry the Cornell Brand – it was suggested that entering students receive a mobile device pre-loaded with Cornell apps or Cornell branded apps.
- Mobile applications should include access to information on parking, transportation, class schedules, events, amenities.
- Mobile applications will engage/reengage technology distracted students.
- Cornell's role as a land grant institution would be well served by mobile applications.

MOOCs:

Online Learning and Massive Open Online Courses (MOOCs) are rapidly evolving topics in higher education. How can Cornell make the best use of these trends and consortiums such as EdX and Coursera?

Note: The discussion on MOOCs was held in only one breakout session. Unlike the other groups the conversation was more characterized by questions than by conclusions. One obvious conclusion that could be taken from the session is that given the growing profile of MOOCs across the United States and around the world, Cornell would do well to seriously examine the phenomenon and develop a position on if and how it would like to engage. - WS

- MOOCs afford opportunity for spreading the Cornell brand.
- What is the Cornell differentiator – architecture? agriculture? In the flipped classroom can Cornell be the original content provider?
- Identify where Cornell can be unique. Do not duplicate others.
- What might the impact of MOOCs be on the Cornell brand?
- What would the impact be on the Cornell brand if Cornell were to join a consortium?
- Can Cornell afford to stay out of MOOCs given Harvard, MIT, Stanford and others?
- The consortia have already made serious investments
- Many questions about IP, copyright, credits, cheating, etc.

- Not all courses are ideally suited nor are all teaching styles
- Larger user base may assist in improving course and teaching.
- What is the financial model for Cornell?
- e-Cornell has high production values. Could e-Cornell have a role in MOOCs?
- MIT is getting a greater selection of global students because of online courses.
- Cornell needs a position and a plan.

New Faculty Expectations:

What IT capabilities have you found at Cornell you did not have at your previous university? What's missing here that you had before?

- There needs to be clear information about what IT resources are available to new faculty.
- Knowing who are making innovative use of technologies would be very helpful.
- Having new faculty complete an IT profile outlining their needs would be helpful. It would allow for a charting of gaps between what is available and what is wanted.
- There should be an IT start-up check list
- Support in the use of technologies is required.
- Collaborative technologies are very important
- Classroom technologies need to be robust – video streaming is difficult to some rooms.
- Some standard level of available technology should be established university wide – currently there is considerable variation among the colleges.
- (The comments in the sessions on classroom technology were significantly echoed in the New Faculty Expectations sessions.)
- New faculty want and are accustomed to more classroom technology than is generally available including iPads, various devices including capture technologies for content on white boards, and document cameras. Better access to the internet in classrooms is required.
- Strong interest in content cloud.
- Better and more consistent sources for information. For example, Duke has a mobile app that provides directions on campus.

Research Computing:

What IT Support do you need for research? How can IT address the increase in mandates, especially for research data? How can IT support more entrepreneurial activities for research?

- Easy cloud access is required.
- Collaborative tools that can handle big data are highly necessary. What do I do with a 5GB file that I need to share? Box does not work.
- Researchers work collaboratively around the world, in addition to sharing data all manner of tools to support virtual research teams are required. For example, there is a need to record video and audio for WebEx that currently cannot be met. One group identified a need to move 40 TB per day to support collaboration.
- Collaboration may not always be with academic or government partners. Private sector partners will also need to exchange data with researchers.
- Many commercial services for big data such as Drop Box do not meet data security requirements.
- Real concern was expressed about the limits on file size for emails particularly for the submission of grants.
- Concerns were expressed about all aspects of data acquisition, storage, distribution, management, curation, archiving. New more robust tools are required. NSF requirements for the preservation of data are becoming more stringent. No one is clear how the requirements will be met.
- Researchers need training in data security.
- A template for meeting NSF, HIPPA, etc. data requirements would be helpful.
- There should be better profile for Cornell research projects in the Cornell website.
- Cornell needs an IPv6 transition plan.
- Reporting requirements for research funds are becoming more onerous. Streamlined, IT enabled reporting would be of enormous assistance.
- Support must be included with the deployment of new tools.
- Centralized services need to be cost-effective in order to discourage a build it yourself approach.
- Researchers believe that the overhead removed from their grants should pay for the IT services they receive. User pay models are perceived by some as having to pay twice.
- Not all researchers are aware of the tools that are currently available nor is there any easy way to discover those tools.
- Skype is an extremely important tool to many researchers.

Student Expectations:

What do students expect from campus IT? How can personal technology be utilized in the classroom?

Note: Students were not involved in this event. There are other processes underway to secure student input into the Cornell IT Strategic Plan. The following comments represent the opinions of staff, faculty, and administrators based on their experience working with students. -WS

- Students need to be able to reserve physical collaboration space on-line.
- Students need access to collaborative applications for on-line work together.
- Student sophistication in IT applications such as social media should not be presumed to preclude the need for more general IT support for learning and research applications.
- They expect their tools to work.
- They will want to use their own devices. Mobile apps are critical. Tablets and smart phones will be used and should be enabled in the classroom.
- WIFI must be ubiquitous and reliable.
- Many of their expectations will exceed delivery possibilities; for example, Google is rather more robust than the library catalogue software.
- Students need consistent access to resources across campus.
- Software training that is quick, effective, and preferably on-line is required.
- Students want speed, reliability, and freedom from hassles in accessing university services.

Technology Support:

What support do you need in order to adopt technology? What are the hurdles and barriers?

- The Infrastructure Must be in Place:
 - Up-to-date computers
 - Current software
 - Appropriate bandwidth
 - Ubiquitous and reliable WIFI
- There must be easy ways to discover potential new technology solutions. A searchable knowledge base could be useful.
- New technologies should be evaluated by the university.
- New technologies should be used as widely as possible across the university.
- New technologies and applications should be mobile enabled.
- End users should be involved in technology deployment decisions.

- Business units will often need help in the preparation of the business case for expenditure on new technologies.
- Support and training must be in place. Up-front training is useful but not sufficient. Cornell should train trainers in order to be able to provide on-going support.
- Technology introduction should be planned.