Introduction

This document has been developed through the Re-Imagine Cornell IT initiative to outline the context and provide a high level summary of approved recommendations for dramatically changing the overall landscape of computing and computing support for the university.

These changes will require a substantial cultural and behavioral shift by faculty and staff. We will not implement change without resistance from various individuals and groups or without some risks—both political and operational. However, we currently realize much risk in our IT environment and endure dissatisfaction with IT support. As it is now, we have increasingly more to lose by doing nothing than by acting. Full implementation will take time, dedicated effort, and, most importantly, leadership support.

Alternatively, the university can decide to control spending by simply shrinking its current workforce or applying budgetary reductions across the board and continue to allow each unit to independently prioritize and provide its own IT support. Some forward-looking units will likely implement a number of changes like those recommended here (modern desktop management techniques, remote maintenance, outsourcing, etc.), but benefits will be fleeting and small in comparison to a concerted, university-wide effort to manage IT at an institutional level.

Vision Statement

The Cornell University information technologies (IT) community will function in a unified manner in the delivery and maintenance of academic, administrative and general campus IT services. The most appropriate standards, processes and procedures will be followed to meet the priorities of the university by using the most secure, efficient and effective means possible. The IT community will be responsive to the needs of its constituencies, be strategically aligned with the mission and direction of the university, and function as a unified, university-wide organization.

Present Environment

IT at Cornell suffers from a number of organizational and service delivery problems which are critically important to address, not only for cost reasons but also to improve staff morale and to reduce risks to institutional reputation. Currently, there is considerable duplication of effort and inefficiency in IT staffing, while at the same time, some important IT services are not well delivered. Service delivery problems are frequently exacerbated by poor alignment of IT investments with the work practices that IT systems are intended to support.

Units and central offices maintain separate and distinct IT organizations with little or no formal relationship, accountability, or regular communication with each other. Many IT solutions and support are defined and built by individuals and small groups, with myriad tools and processes (both locally and centrally), without consistent application of standards, review of existing commercial options, or investment analysis.

University administration and business management often places unclear and convoluted business process requirements on IT solutions further creating the need for and perceived value of custom builds and modifications rather than standard solutions.

The growth of the consumer technology market and proliferation of accessorized computers, peripherals and mobile devices, combined with a lack of control on university procurement and the expectation that “we can
support anything and everything” in the units, has led to an insatiable appetite for support coupled with widespread dissatisfaction with the services provided.

The university is at a critical point in its ability to manage limited resources. This financial challenge occurs at the same time that further divergent developments in enterprise-level computing are taking place, bringing with them their own set of financial pressures. Without a strategic effort to exert control on ourselves now, the current situation will get worse at an ever-increasing pace. It should be clear that maintaining the status quo is not a viable option.

**Critical Areas**

**Governance**

IT leadership must ensure strategic alignment with broader university objectives across all units. This can be accomplished through the development and maintenance of a strategic IT plan, establishing and managing a university-wide IT budget, setting priorities, and regularly reporting IT metrics.

Balance must be struck between the efficiencies to be accomplished by centralized IT and the flexibility and responsiveness gained through local or distributed delivery. An institutional IT organization must embrace, support and enhance the complementary needs and roles of both central and distributed IT services. This balance must also be evident in decision-making processes. The university must provide clear principles, standards and oversight, while allowing for local program and details to inform any central analysis.

The chief information officer (CIO) and university management must be accountable for the delivery of IT services to all units. Annual reviews for units and central offices must include metrics, project profiles, staffing levels and assignments, service quality, IT project strategies and all exceptions.

Cornell should retain a hybrid IT organizational model to balance central optimization and local flexibility. CIT should function as the central utility and service provider that supports unit-specific IT groups that can better meet local needs through closer programmatic connection. For such a model to be successful, we believe it is imperative that the unit IT directors have dual reporting to the CIO and the office of the VP or dean heading the unit.
The chart below offers a view of a new IT community for Cornell. *Note:* ITGC refers to IT Governance Council.

**Proper governance will ensure the ITGC has oversight into IT activities across campus**

<table>
<thead>
<tr>
<th>High-Level Reporting Relationships</th>
<th>Description</th>
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<tbody>
<tr>
<td>University-Wide ITGC Oversight</td>
<td>ITGC makes <strong>strategic decisions</strong> that apply campus-wide</td>
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<tr>
<td></td>
<td>- Establishes <strong>IT priorities</strong></td>
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<td></td>
<td>- Approves <strong>campus-wide staffing requirements</strong></td>
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<td></td>
<td>- Approves <strong>annual IT budget</strong></td>
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<td></td>
<td>- Drives <strong>accountability</strong> for an effective IT organization</td>
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<tr>
<td>VP/Dean</td>
<td><strong>CIO</strong> has reporting relationships with CIT and IT service groups</td>
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<tr>
<td>VP/Dean</td>
<td>- Sets <strong>campus-wide standards</strong> and ensures best practices are followed</td>
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<tr>
<td>CIO</td>
<td>- Enforces basic service levels campus-wide</td>
</tr>
<tr>
<td>VP/Dean</td>
<td>- Recommends <strong>staffing roles and levels</strong> for CIT and IT service groups</td>
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<tr>
<td>VP/Dean</td>
<td><strong>IT service group directors also report to VPs/Deans</strong></td>
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<tr>
<td>Director of IT Service Group</td>
<td>- Unit leadership ensures that service groups are meeting units’ programmatic needs</td>
</tr>
<tr>
<td>Director of IT Service Group</td>
<td>- Unit leadership <strong>monitors and enforces unit-specific service level agreements</strong></td>
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**NOTE: IT Service Groups:**
Service Groups are a redeployment of local IT functions and may be shared by multiple units. They develop unit-specific applications, perform in-person support, and host walk-in support centers.
University-Wide IT Services

While greater collaboration and oversight must be achieved across the university IT function, there remain critical components that should be provided by the central IT unit.

Such critical central components include providing general networking, storage, and hosting services; developing, supporting and maintaining campus-wide IT standards; delivering IT services according to institutional priorities; and staffing core functions such as project management, IT quality assurance, IT security and other infrastructure components in the most cost-effective manner possible.

Local IT roles and functions should be focused primarily on value-added and unit-specific IT features. Central coordination for IT decisions, investments and budget must be provided through the CIO and ITGC while relying on local IT for definition and development of standards and their consistent application. Additionally, large applications projects (TIER 1) will be carried out in partnership with local IT and business functional leaders to leverage subject-matter expertise, technical talent and program-specific knowledge.

End User Support Standards

The supported hardware and software platforms must be limited in order to both provide better service and constrain rising costs. While no single hardware vendor or operating system will likely meet the broad needs of the university, two or three hardware vendors, with a small number of configuration options from each vendor, could greatly improve service quality and contain costs while meeting academic and administrative needs. A similar argument holds for system software.

IT support services need to be coordinated to take advantage of modern desktop maintenance tools such as distribution of standardized images and remote debugging. Currently most IT support people on campus have to “figure it out on their own” and they don’t have ready access to the right expertise for solving challenging problems. The second critical change is in end-user support, where it is important to develop approaches that effectively combine centralized support functions with local unit support.

Components critical to implementing this approach include providing effective triage and escalation procedures, which help ensure that the most effective form of support is being used to address a given problem. Certain problems are best fixed by an expert on site, whereas others are best fixed by a remote expert, and yet others by a combination of self-service web sites and phone or chat-based support. Of course, dispatch of local IT specialists for emergency support must be provided to quickly address immediate mission-critical functions in each area. Right now the default in most organizations is on-site support provided by a limited number of staff who may lack the required expertise and who have little backup to cover absences. This is a very expensive service model for handling routine issues.

Application Development Standards

Improving IT at Cornell will require substantial change in both institutional governance and business practices. Changing one while neglecting the other will not achieve the desired results. Effective governance of information technology requires effective governance of the academic and business administration that dictate system requirements.

Developing or molding a solution to meet existing, often historical or idiosyncratic practices, is ineffective and expensive. We instead need to make careful choices of standard IT systems and services while simultaneously redesigning the affected work practices so that they are effective with the new systems and services. This will require clear roles and effective partnering between IT leadership, functional area leadership and executive
leadership. Decisions made to invest in one area must be balanced against overall university needs and priorities.

Perhaps the most important implication of these changes is shifting from a custom-built or extensively customized environment to standard, externally provided software-as-a-service (SaaS) environment or to vendor-supplied applications. The building of in-house software needs to become the last resort rather than the preferred means of providing IT services. This will require substantial changes in our design and requirements processes, as well as a move from a staff with extensive programming skills to one with extensive skills in requirements gathering, choosing and implementing off-the-shelf systems or services, integrating new solutions into our existing infrastructure and managing outside vendors and contractors. Thus, our development efforts must shift from custom development to one of solution integration.

Moving from our current IT environment to the one described above will require a significant cultural, organizational and governance change. This new IT culture must support the achievement of strategic alignment, university-wide IT oversight, broadly accepted IT standards, as well as improved communication and collaboration between central and unit IT management and staff.

**Savings Opportunities, Staffing Changes and Next Steps**

**Savings Opportunities**

Following the diagnostic work done in the fall of 2009, considerable opportunities for savings were identified in two broad IT functional areas: application development and end-user support. These areas not only offer considerable opportunity for efficiency gains but they also require staff with new skills and the ability to implement and support new approaches. It may be impractical to obtain staff with necessary skills solely through retraining.

New services and applications should be created using standard services and software rather than the current approach which often favors customization. If our current IT culture is not significantly changed in application development, it will be very difficult if not impossible to change approaches.

We propose to first reduce staff primarily in the application and service development area. This step comes with some risks due to cost-reduction efforts in other areas such as purchasing, finance and HR that will yield requirements for new IT systems and services. However, we believe the deployment and maintenance of these new systems and services must be done with a new service and application delivery model. To achieve this goal a budget action to reduce overall cost must be coupled with additional reductions that need to be immediately reinvested to provide new talent in support of the new organization.

In the user support area, much standardization and modernization needs to be put in place before staff can be substantially reduced without high risk of lowering the service levels available to our users. Thus, in our view, user support reductions are considerably less practical to undertake in the first phase of reorganization and should be approached in a second phase of implementation.

**Staffing Changes**

Staffing changes and reductions are unavoidable and necessary to reduce costs and move toward a new organizational structure, standards and set of services.
In each area impacted we should provide the opportunity for the unit to request an ITGC review of critical functions at risk for failure. This process would require complete documentation of the IT functions they support, a joint analysis of priorities and processes with the dean /VP and ITGC, and then a decision by ITGC.

Implementation of a new staffing model will create fewer but more similarly staffed local IT service groups (shared by a small number of units), providing opportunities for highly-skilled professional staff to excel at their work and build meaningful careers. These local IT service groups will be complemented by CIT for those functions that are best provided centrally, some of which are discussed above.

To govern the university IT community and investments as an institution, it is essential that we carefully identify and enforce the balance between central and local decision making and support.

Next Steps

While specific details of implementation are to be developed with broad community engagement and input, the following steps outline the major areas of change we will embark upon as approved by the president and provost.

1. Establish central coordination of IT services across units through the IT Governance Council (ITGC) and Chief Information Officer (CIO), which will be a new role with responsibility across the Ithaca campus, not limited to the leadership of CIT. Coordination will be further supported through the establishment of a joint reporting relationship for campus IT Directors to the Chief Information Officer and to the respective unit leader.

2. Create proposal for clustering of IT unit staff in appropriately scaled service groups for better access to expertise and increased efficiencies. This will review and approved through the ITGC.

3. Implement a centrally coordinated triage process for end-user support and deployment of industry-standard tools for remote support.

4. Clearly define and implement specific structures, processes and measures of accountability to ensure appropriate service quality and cost objectives are maintained on an ongoing basis. This should include, but not be limited to, service agreements defining standards, metrics, data access and reporting, and accountability between service groups and those they serve.

5. Define and implement campus standards for hardware and peripherals purchased on non-sponsored funds with the objective of significantly limiting the number of different devices and configurations to enable efficient end-user support.

6. Implement the prioritization and approval process for non-sponsored applications development as recommended to the Steering Committee.

7. Establish standard approaches for IT solutions delivery which defaults to a “buy” rather than “build” strategy and requires substantial burden of proof for choosing non-standard methods.
8. Work with the Vice President for Planning and Budget to implement the budget and billing recommendations within the framework of changes to the Ithaca campus budget model.

9. Define a detailed staffing plan for FY 2011-2015. This staffing plan must be reviewed and approved by the ITGC in accordance with the ITGC’s responsibility to approve campus-wide IT staffing requirements. Further, we ask you to work with the Vice President for Human Resources as specific staffing levels are formulated.

These are the recommendations of the Initiative to Reimagine IT at Cornell, as adopted by the President and Provost in May 2010. Many people contributed to the formulation of these recommendations, and the detailed implementation and refinement of the recommendations will involve considerably more effort from more people.

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Please contact Paul Streeter for additional information on this or any of the initiatives to reimagine Cornell’s administrative operations.