

UConn



IT Strategic Plan | 2014-18

UNIVERSITY INFORMATION TECHNOLOGY SERVICES
UConn's SOURCE FOR COMPUTING AND TECHNOLOGY



Data center, Edward V. Gant Science Complex.

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LETTER FROM THE VICE PROVOST AND CIO

Dear Colleagues,

I am pleased to share with you the University Information Technology Services (UITS) strategic plan. This document contains the best thinking of our university community and represents key directions for institutional information technology at the University of Connecticut.

Information technology consists of a rapidly changing set of systems, services, and capabilities. Every institution is attempting to navigate this complex landscape and to address a relatively common set of challenges. That being said, strategic planning is institutionally personal. It is informed by local realities and cannot simply be adopted from an external source. The challenge was never to generate a laundry list of technologies but was always to identify the smallest practical number of key choices that would have the greatest impact on the success of the University.

Over the past months, UITS has reached out to the community to solicit information and to seek guidance. I am proud to share that many have given freely of their time, energy, and expertise. Your engagement has humbled us. Your thinking has challenged us. Your views have informed our understanding of the institution and the significant role that IT does and can play. I appreciate each and every one of these contributions.

The University of Connecticut is an ascendant public research university with a history of success and a future of great opportunities. IT will play a vital and necessary role in our achievements going forward, and I am excited to be a part of UConn, the university IT community, and UITS.

Regards,

Michael R. Mundrane
Vice Provost for Information Technology and Chief Information Officer



EXECUTIVE SUMMARY

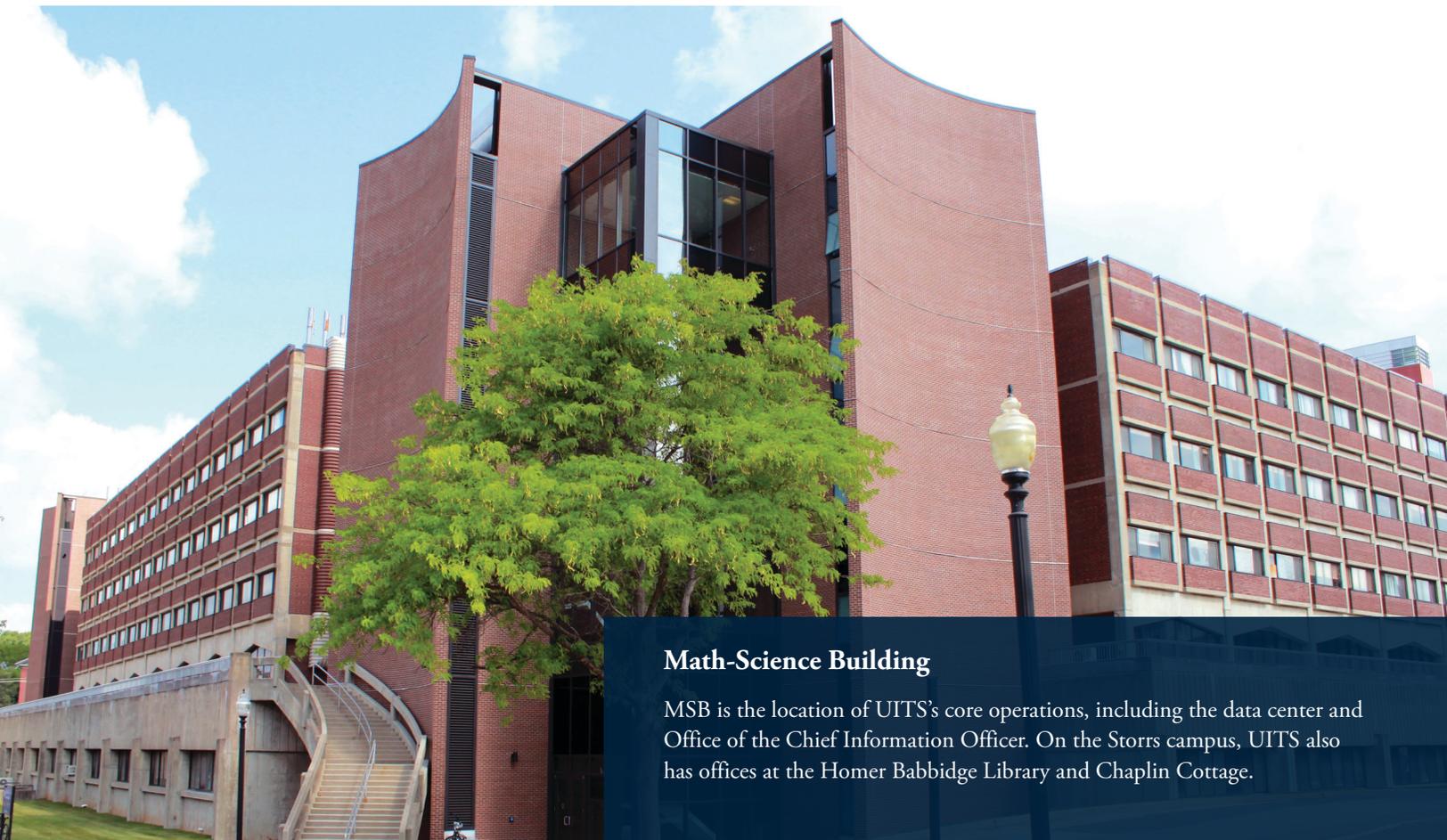
Information Technology (IT) is an important asset for the University of Connecticut and a key means to achieving the institutional mission of research, teaching, learning, and outreach. As the provider of central technology and computing services, University Information Technology Services (UITS) is responsible for deploying, managing, and maintaining IT systems, services and capabilities to best meet the evolving needs of the university and for ensuring the appropriate relationship between the IT infrastructure and the UConn mission.

This strategic plan encapsulates our best practical thinking regarding IT at UConn. The planning process began by having targeted conversations with key stakeholders to accurately assess the needs of the community. This initial feedback period influenced the three-month planning process and informed the development of goals, strategies, and initiatives.

To ensure our alignment with community needs and the institutional mission, we categorized university activities and operations along two key dimensions. The first consists of three main group roles that effectively organize the university community into three collective group roles. The second assigns a limited number of key individual roles that categorize the diverse activities of people. Over time, we will use these groups and roles to assess the relevance and impact of our strategic plan.

Group roles: Academic, Functional, and Technical

Individual roles: Researcher, Teacher, Learner, Staff, Resident, Guest



Math-Science Building

MSB is the location of UITS's core operations, including the data center and Office of the Chief Information Officer. On the Storrs campus, UITS also has offices at the Homer Babbidge Library and Chaplin Cottage.

The goals and strategies in this plan are organized to meet the needs of the community in their roles as individuals (Goal 1) and within their institutional groups (Goals 2 – 4). Goal 5 pertains to the infrastructure and the enterprise-level systems, services, and capabilities that are critical to the success of all the other goals and strategies. The five main goals are the following:

- Goal 1:** Pursue IT solutions that empower members of our community to successfully, productively, and securely engage in all of their institutional roles as individuals.

- Goal 2:** Pursue IT solutions under the guidance of our academic partners that facilitate effective research, enrich teaching and learning, and enhance institutional competitiveness for extramural funding.

- Goal 3:** Pursue IT solutions in concert with functional partners that support the business of the University and increase operational effectiveness.

- Goal 4:** Pursue IT solutions that assist technical partners at all UConn campuses to successfully provide for the specific needs of their respective communities.

- Goal 5:** Pursue IT solutions that can best be provided centrally and deliver them securely, efficiently, and robustly at scale.

In addition to asserting a vision for advancing IT at the university and for ensuring it successfully supports institutional growth, these goals and the strategic plan also clarify our relationship with the UConn community. As we move forward, we are committed to providing financial and operational transparency through effective communication while also opening channels for feedback from our constituents.

The strategic plan was the first step in establishing this connection. The plan is designed to guide operations and the evolution of services for the next five years. We will re-evaluate the plan at least every two years to ensure continued alignment and with an eye towards maintaining relevancy. We will again reach out to the community for feedback that will guide refinements and adjustments.

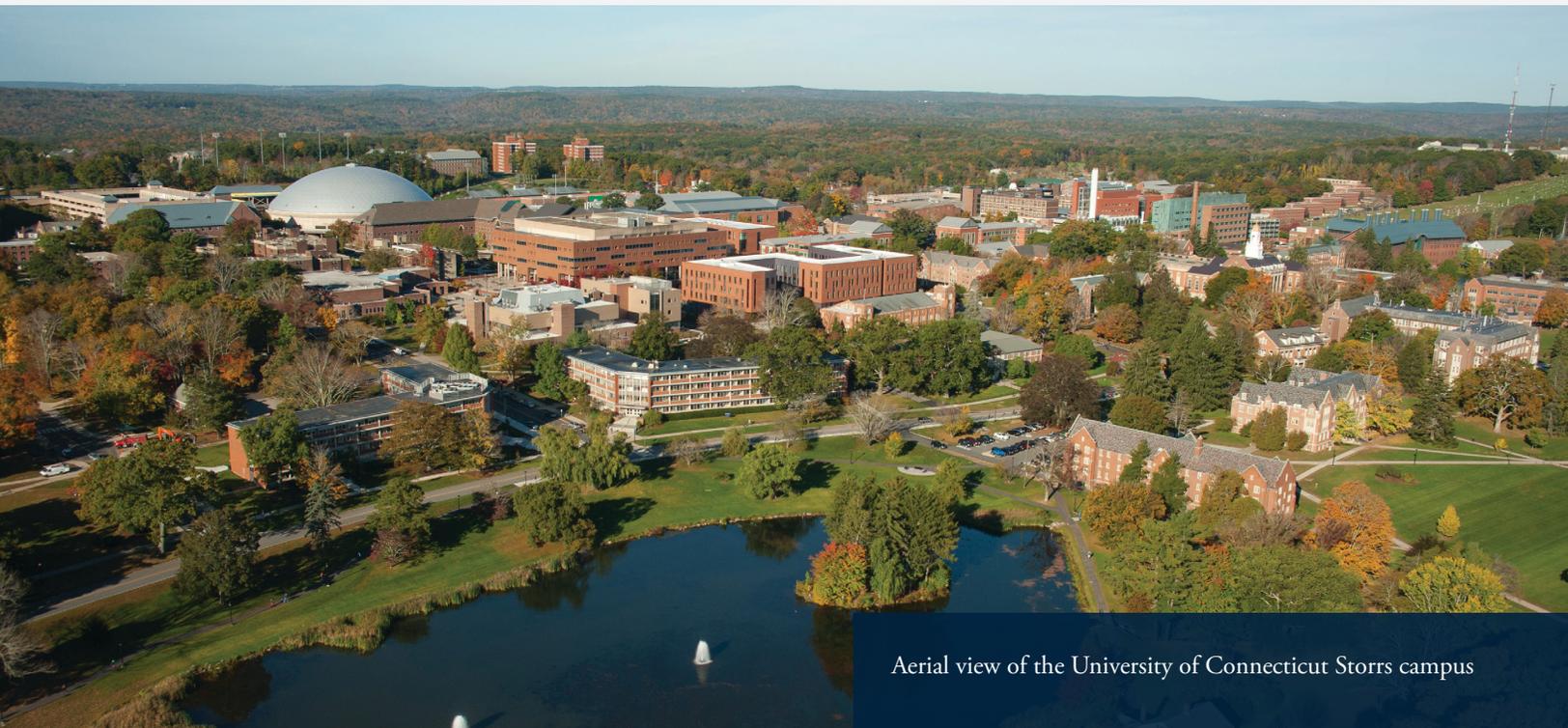
INTRODUCTION

Information Technology (IT) is fundamental to institutional success. It provides the services and capabilities that the entire University of Connecticut community depends upon daily for operations, such as the network, data storage, and administrative systems. IT has the potential to be transformational by enabling innovative research and the delivery of pedagogical content in new, engaging ways. As such, it can then become a recruitment tool by creating a technology-rich environment where talented faculty want to work and students want to learn and live. For the many and varied business and administrative processes that keep the University operating smoothly and efficiently, IT supplies the data management and reporting tools to turn raw data into meaningful information that guides institutional decisions.

Although it permeates the university environment, IT is not the purpose of the institution but is, instead, a means to achieve the institutional mission of research, teaching, learning, and outreach. The success of each is dependent on effective and efficient IT services. Thus, the success of an IT organization is defined not by its ability to execute any specific system or service in isolation but by its overall contribution to the institutional mission.

As the provider of central technology and computing services, University Information Technology Services (UITS) is responsible for maintaining this fidelity of services, systems, and capabilities to the institutional mission. As UITS plans for the growth and evolution of services, we consider:

- **Current capabilities** and how to maximize them with incremental improvements
- **Resource realities** and the constraints it places on current and future services
- **Future capabilities** and choosing short-term solutions that will not sacrifice long-term plans
- **Community impact** and ways to maximize positive and minimize negative experiences
- **Capacity for change** and our ability to evolve services and be accountable for their value and success



Aerial view of the University of Connecticut Storrs campus

Janine Caira, board of trustees distinguished professor of ecology and evolutionary biology, has conducted world-renown research on the cestodes (tapeworms) that parasitize the digestive system of sharks and rays. For a current National Science Foundation (NSF) funded project, Caira and colleagues collaborated with cestode experts from 21 countries to expand knowledge of tapeworms globally. To compile and synthesize new and existing taxonomic information on cestodes and to track host/parasite data, Caira collaborated with UITs to develop the Global Cestode Database, a key component of the NSF grant. The database coordinates data collection and makes the information available to the public.



This strategic plan captures our current assessment of IT at UConn and what our community can expect from our organization. With this plan, UITs establishes a vision for advancing IT at UConn and its capacity to facilitate innovation and excellence in the University's core missions of research, teaching, learning, and outreach for the next five years. The plan is dynamic. UITs will actively solicit feedback from our community every two years to reassess both the plan and its relevancy to the needs of the University. This will guide improvements to extant and pending systems, services, and capabilities.

Many groups contributed to the development of this plan and made the strategic planning process a community-based effort. Our three governance groups, made up of academic, business, and IT representatives, partnered with us to identify and prioritize initiatives. Prior to beginning the planning process, Vice Provost for Information Technology and Chief Information Officer Michael Mundrane met with university deans to discuss their IT priorities and later continued the conversation to review initiatives from the governance groups. UITs also reached out to students and alumni and requested feedback about their experience with IT at UConn. With this information from our constituents, the Strategic Planning Committee, made up of UITs directors and managers from the Storrs and regional campuses, began a three-month process. The result was the development of forward-looking goals and strategies that provide a framework for future direction.

"The Global Cestode Database was developed in close collaboration with UITs as part of a National Science Foundation funded project to survey and inventory the tapeworms of the planet. The final result (tapeworms.uconn.edu) has gone well beyond our original expectations. It has revolutionized the way we manage, organize, and share our data, not only between labs and among countries, but also with the public at large! The database now serves as a critical resource for the global community of researchers investigating tapeworm biodiversity. It has catalyzed synergy among research groups and has greatly facilitated collaboration and synthesis across tapeworm taxa. The host element of the database has developed into a key repository for images and data on sharks and rays making comparisons across regions of the world possible for the first time."

- **Janine Caira**, Professor of Ecology & Evolutionary Biology

MISSION

Identify, implement, operate, and evolve impactful enterprise systems, services, and capabilities in support of research, teaching, learning, and outreach.

Technology is a means to an end, a tool that enables and empowers people to operate and interact in their many roles. We function in an environment infused with technology, which makes it difficult to separate the purpose of our activities from the mechanisms that enable them. Exchanging drafts of a publication with a colleague in another country through shared document storage is, at its core, communication and collaboration assisted by technology. The reason we use technology is because it enhances efficiency and productivity, both of which foster innovation.

UITs provides enterprise-level systems, services, and capabilities and in this position, must consider the needs and constraints of the entire organization. As the central source of IT, we can provide expertise, enhance efficiency through consolidation of resources, and leverage economies of scale to the advantage of the community we serve.

Efficiency and cost containment are standard outcomes of effective enterprise services and are results that our UConn community can expect from UITs. For long-term strategic planning specific to the University, however, we want to surpass the status quo and set the course for advancement and excellence. To achieve this objective, UITs evaluates systems, services, and capabilities by their potential for significant institutional impact. The qualities of impact, defined for this plan and for future assessments, include:

- **Demographic appeal:** How well will the IT solution resonate with our community?
- **Financial:** Is it a sound investment that fits budget constraints?
- **Risk mitigation:** Does it pose any threats to security, or will it interact negatively with current systems?
- **Foundational:** What is the product's life span?
- **Visibility:** Will it help establish a positive reputation for UITs and the University?
- **Transformational:** Does it have the potential to transform research, teaching, learning, and living for our community?

If a service, system, or capability fulfills the criteria for impact, then the next consideration is whether or not UITs can deliver it efficiently, robustly, and at scale to our constituencies. If a service, system, or capability does not meet these broad conditions, then UITs employs strategies to support initiatives for distributed IT, if appropriate, or pursue alternative solutions.



RELATIONSHIP WITH UCONN COMMUNITY

UITs is responsible for centrally delivering IT services at the main campus in Storrs, five regional campuses, Schools of Law and Social Work in Greater Hartford, and the Graduate Business Learning Center in downtown Hartford. We also provide services to the eight Cooperative Extension Centers throughout the state. For this plan, however, the focus is not on serving locations but on assessing, anticipating, and meeting the needs of the people that make up the UConn community.

UITs recognizes that people function both as part of a group, viewing and making decisions about issues from this perspective, and as individuals, assessing an issue by its relevance to their personal work and life. From a strategic planning perspective, university activities and operations can be categorized within three main groups:

- **Academic**
- **Functional/business**
- **Technical**

For our governance structure, UITs partners with these three groups, and their input has shaped the development of the goals and initiatives included in our strategic plan. The broad categories of individual roles that people occupy and operate within are:

- **Researcher**
- **Teacher**
- **Learner**
- **Staff**
- **Resident**
- **Guest**

Members of our community operate in both the group and individual spheres. For example, a faculty member may evaluate the importance of an IT initiative based on their membership in the academic group, and in this position, may prioritize capabilities such as secure network infrastructure. However, in their role as an individual interested in retrieving their data off-campus, they may value access to files independent of geographic location.

RELATIONSHIP WITH UCONN COMMUNITY

For the strategic plan, UITs used these defined groups and roles to ensure a focus on the people we serve and the services, systems, and capabilities that impact their success. In the long run, we will assess our progress and performance by the relevance and impact of our goals, strategies, and initiatives on the group and individual roles.





INSTITUTIONAL ALIGNMENT

UITs's strategic plan defines the role we play in fulfilling the University's mission and the academic vision articulated in "Creating Our Future." Alignment with institutional priorities creates a framework that informs decisions about IT resources, investments, and staffing while also shaping the services, systems, and capabilities we offer to our community. In addition to the institutional mission, we are mindful of the University's challenges in regards to reduced state operating budget support and pressure to increase research and service. Accordingly, the directions we recommend for central IT contribute to the strategies identified in the academic vision to increase revenue and enhance recruitment and retention.

Support contract and grant acquisition

UITs supports university-wide research and scholarship by providing essential networking infrastructure and network attached storage. Increasingly, the success of research and scholarship and pursuit of extramural funding depends on the management, manipulation, and exchange of digital information. These activities require a baseline standard for network performance and capacity. In the STEM areas, for example, researchers require a reliable data network to take advantage of the investments made by the state from Next Generation Connecticut and to comply with the requirement of many federal agencies to submit a Data Management Plan with grant applications. As funders require assurance of adequate facilities to conduct proposed research projects, our ability to provide this standard becomes an integral part of the acquisition process.

Enhance recruitment and retention

An environment conducive to high-level research and scholarship aids the University's priority to recruit and retain top-notch faculty and graduate students. This technical foundation also enhances our ability to deliver other systems, services, and capabilities that matter to our teachers, learners, and residents. Members of our community expect contemporary services, where the technology they need is always available, immediately useful, self-directed, continuously improved, and incrementally released. From a resident's perspective, this may translate as the ability to connect their personal devices to our network anywhere on campus. For faculty, this may involve leveraging distance-learning technologies to deliver an online class. Whatever the form and function, our ability to deliver this experience will help the University attract and retain faculty and students.

Streamline bureaucratic and administrative processes

Fulfilling our institutional commitments extends beyond supporting faculty and students and their research, teaching, and learning endeavors. We also support the people and organizations that perform the services that undergird university operations and like UITs, help the University achieve its mission. Through partnerships, we work in concert with business and administrative units and IT professionals to develop and deliver the systems and services that enhance their efficiency, productivity, and ultimately, ability to fulfill their institutional obligations.

Leverage state investments from Next Generation Connecticut

A substantial investment in infrastructure and facilities is necessary to support the evolving needs of the University and keep pace with our peer and aspirant higher education institutions. UITs will seek opportunities to leverage Next Generation Connecticut funds for large-scale improvements that will support STEM research specifically but will also benefit the entire University.

GOALS AND STRATEGIES

This upcoming five-year period is a critical time for IT at UConn. Current and future students and faculty expect a borderless university, an environment that gives them constant access to the network through devices of their choice. This expectation is only going to grow, especially as applications become more and more available through virtual sources and the amount of data stored and processed increases. These demands on the network, along with the systems, services, and capabilities reliant upon it, span all areas of university functions, from residential life to research activities. As such, the need for a well-engineered, robust physical and network infrastructure becomes increasingly important.

The long-term effects of constrained budget, however, have prevented the normal refresh of the infrastructure and led to inconsistent network performance and availability. Network capabilities are dependent on both network hardware and physical components of the infrastructure, and each can be a limiting factor. Approximately 90% of UConn's network hardware will be out-of-support or have limited support after July 2015. Areas on the UConn campuses also have old physical infrastructure, which needs to be updated. While our ability to provide a robust network is progressively compromised, pressure from the state and institution to enhance research, teaching, and learning increases. Without a reliable and robust network, we will be unable to meet these challenges, and the far-reaching consequences impact revenue, recruitment, retention, and reputation for the University.

Aligning with the University's priorities, the following goals and their strategies lay the groundwork for an environment conducive to achievement in research, teaching, learning, and outreach now and in the future. The goals focus on how IT can contribute to the success of our community and institution and are also attune to the evolving trends in technology. Ultimately, our ability to effectively deliver the systems, services, and capabilities that promotes growth in the institutional mission depends on a robust infrastructure as well as best-practices in high availability, security, and sourcing. This approach requires a substantial investment but is essential to maintain pace with the evolving needs of the University, increase extramural funding awarded to our faculty and graduate students, and grow our international reputation.

Organization of goals and strategies

The following goals and strategies are organized to meet the needs of the community in their roles as individuals (Goal 1) and within their institutional groups (Goals 2 – 4). Goal 5 pertains to the infrastructure and the enterprise-level systems, services, and capabilities that are critical to the success all the other goals and strategies. Under each goal, we list strategies and the reason behind their importance to illustrate approaches to achieve the goals.

Strategic planning committee

Michael Mundrane, VPIT/CIO

Josh Boggis, Server Support Group

Mick DiGrazia, Server Support Group

Jeffrey Farese, Telecommunications -
Network Operations

Haleh Ghaemolsabahi, Engagement
Services

Kristy Hughes, Office of the VPIT/CIO

Jila Kazerounian, Enterprise
Applications

Ryan Kocsondy, Hartford ITS

Steven Maresca, Security

Ashley Mattingly, Engagement Services

Jonathan Moore, Help Center

Jason Pufahl, Security

Debora Romano-Connors, Enterprise
Applications

Roxanne Roy, Business Office

Scott Taylor, CEN

Michael Williams, Telecommunications
- Infrastructure

Goal 1: Pursue IT solutions that empower members of our community to successfully, productively, and securely engage in all of their institutional roles as individuals.

Mobile device

Construct an infrastructure and operating environment that supports a set of commonly-used devices so that the community can select technology and services that better meet their needs

Members of our community expect to use their personally-owned or individually-allocated university devices with UConn's systems. While UITS does not prohibit the use of any device or its connection to our systems, it is not practical for us to provide the infrastructure and the accompanying usage support to accommodate every device. To ensure the best experience for the maximum number of people, UITS provides comprehensive support for the most prevalent devices.

Mobile applications

To identify focused units of service or capability and provide encapsulated access via a standards-compliant lightweight interface

People increasingly interact with electronic media, access personal content and data, and perform academic, business, and technical functions via mobile devices. As more people expect that functionality, UITS will look for opportunities to provide flexibility of access through mobile apps for the most prevalent devices and platforms used by our community.

UITS currently offers apps on Apple and Android devices for services, such as accessing a mobile version of Blackboard, real-time tracking of buses, viewing dining menus, browsing the course catalogue, and checking email. For a complete list of current offerings, visit mobile.uconn.edu.

Collaboration

Enable individuals to produce, consume, and work together efficiently and productively with integrated tools

On a daily basis, people use communication tools, such as email, the phone system, and instant messaging to exchange information and interact with others within and outside the University. In all of our roles as individuals, we are reliant upon these tools; they remove barriers to collaboration and enable us to quickly and easily communicate, coordinate activities, and ultimately, complete tasks more efficiently.

In response to pressure to optimize business processes, new suites of integrated systems and applications are evolving to allow users to traverse modes and media of communication. UITS's role is to identify tools that will benefit our community and integrate into enterprise systems.

Software

Provide software products that achieve both broad impact for the community and affordability

UConn Software is an advisory board to the University Chief Information Officer. In conjunction with UITs, UConn Software represents community interests regarding the acquisition, distribution, and customer support of instructional, administrative, and research software products.

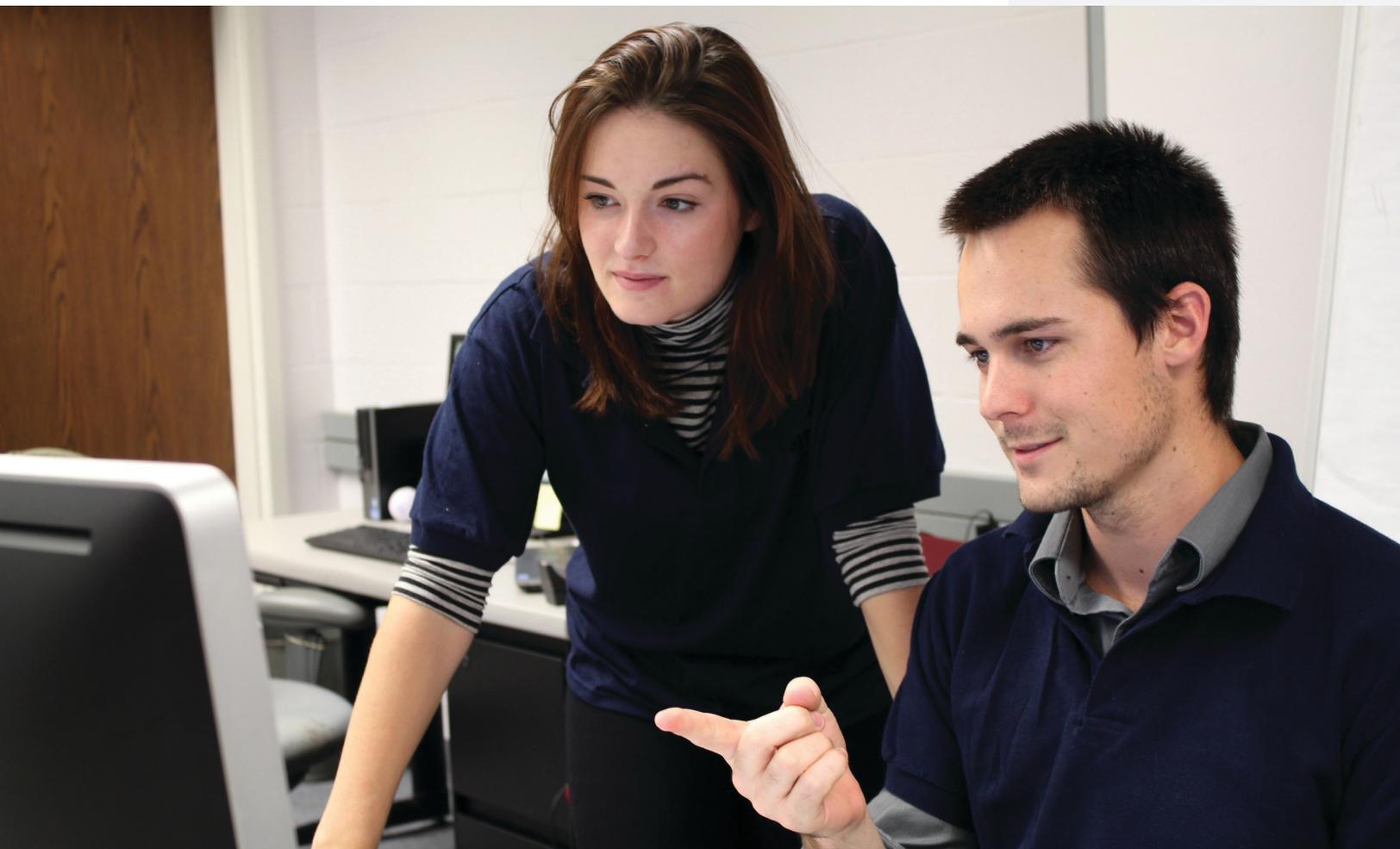
Support services

Develop a structured approach that spans problem prevention through detailed technical engagement for the purpose of maximizing customer-directed through-put to resolution

The goal of effective support services is to ensure individual's success with technology and provide timely resolution if a problem arises. The proposed tiered structure accomplishes this high through-put by emphasizing immediacy and providing tiers of support with increasing levels of specialization and expertise based on the complexity of the issue. Taking a proactive approach, UITs will also use individual instances to gain insight on issues that may affect more members of the community and then address them before users experience a disruption in service.

UConn Software

The value of this body is driven by the cumulative knowledge and perspective of university professionals with a wide variety of responsibilities and distinct constituencies. The use of software on university supported (in some fashion) equipment can vary widely. Any central or centrally supported body will endeavor to focus on those software products that have the greatest relevancy to the broadest community. They are well positioned to provide wise counsel and feedback.



Goal 2: Pursue IT solutions under the guidance of our academic partners that facilitate effective research, enrich teaching and learning, and enhance institutional competitiveness for extramural funding.

Research

Data

Evolve and support institutional research data through the entirety of its recognized lifecycle from creation through curation

Strong extramural research programs are vital to the success of a university, and growth in this area is a focus for UConn. Increasingly, research requires the transport, storage, access, and manipulation of large amounts of data, which naturally includes remote or local acquisition, ongoing analytics and visualization, and both immediate and long-term storage. Big data and complex systems are examples of this research noted as areas of opportunity for the University. Since both require modeling and analysis of interactions of massive data sets, UConn's success in these areas depends on infrastructure capacity and the cultivation of core academic and research thrusts. UITs will partner with faculty to develop and support the research projects while seeking opportunities to make sustainable improvements to infrastructure capacity. Funding agencies have historically required that data generated as part of funded research be made available post publication. It is not realistic for every individual research activity to independently craft a strategy for the long-term preservation of their data. Submitted proposals for external funding generally require a credible data plan. While this is not a role that UITs would provide exclusively, research data as an institutional strategic asset obligates key university areas to coordinate on effective solutions to this immediate and long-term challenge.

High performance computing

Develop institutional capabilities for research computing that provide an effective operations environment coupled with research team supported and prioritized access to infrastructure

Effective high performance computing, both historical and contemporary, depends on infrastructure capacity, high levels of capability, and productive partnerships with our researchers to provide the support needed to foster computational research and attract extramural funding.

The use of cloud providers for all or part of high performance computing is a possibility that requires alignment of the researchers' needs with the general use case for which the cloud facility was designed. The advantages of cloud providers are that their infrastructure is large, robust, and well maintained, and from the customers' perspective, they "feel" infinite and not fundamentally different from executing across a campus. Cloud providers, however, typically provide generic compute with modest per core resources and modest effective bandwidth to storage. This accommodates the use case model where the cloud facility is used for long-term storage and once stored, subsets of data are used locally and large amounts of data are not broadly accessed outside of the cloud facility. Many of our researchers, on the other hand, have large, long-term storage needs with essentially permanent compute needs where

they move significant amounts of data in and out of any facility. This data centric compute use case is much more specialized than the one intended for the typical cloud facility.

UITS has a key role as a liaison to external or provider of local significant infrastructure to develop, in concert with our institutional partners, compute capabilities that meet existing and future high performance computing needs of the broader institutional research community.

Term consulting

Provide specialized support that addresses environmental complexity and general skill gaps for our researchers and enhances innovation and capabilities for our teachers

Research teams have been quite adept at increasing their technical competency in order to best pursue their activities. Despite this, the rate of complexity outstrips the ability of research teams to acquire the necessary technical skills, which impedes research activities and causes them to fall behind. It is not realistic to resolve this dilemma by simply having every research team meet the highest and monotonically increasing level of technology competency. A better approach would be to build a team of technology experts that are available for modest duration engagements. By combining them with researchers facing specific technical hurdles, the University can match technology experts with research domain experts for the expressed purpose of enhancing research team productivity and accelerating research outcomes.

Teaching and learning

Instructional technologies

Enhance and provide for technology infrastructure and tools to create, manage, preserve and disseminate pedagogical content

In pursuit of excellence in teaching, our faculty are encouraged to explore modern learning modalities and different curricular strategies to engage students and enhance education. Technology is a powerful tool that can expand education beyond the classroom walls and is highly relevant to our current and future students' interests and capabilities. UITS will provide the tools, such as online and distance instructional technologies, that empower our faculty to transform teaching and learning at UConn.

Advanced classrooms

Deliver a predictable, sustainable technical baseline for all university classrooms that supports robust teaching and learning

Innovative teaching increasingly leverages technology to enhance student learning and creates new ways to engage students.

UITS currently supports high-tech classrooms, which are typically equipped with ceiling mounted LCD

projectors, document cameras, and a projection screen. As more teachers use the technology to aid and enhance teaching, UITS will facilitate effective use of the equipment while also ensuring a consistent experience for our teachers by providing common-level wireless. A key component to any effective, long-term strategy regarding classroom technology is a fully defined and resourced multi-year life cycle. Only a consistent application of resources over a prolonged period of time will permit the predictable, high-quality experience that instructors and students require and expect.

Academic analytics

Provide outcomes assessment and learning analytics tools to support faculty and student teaching and learning effectiveness

Assessment provides information about areas of success and of needed improvement. Academic analytics will become an important tool to measure performance in research, scholarship, and teaching that will help guide institutional improvement at a time when UConn has established clear directions for growth. UITS will work closely with the Center of Excellence in Teaching and Learning (CETL) to provide analytics tools to support efforts on curriculum design, instructional decisions, learning progress maps, and advising data.



Goal 3: Pursue IT solutions in concert with functional partners that support the business of the University and increase operational effectiveness.

Document management system

Enhance the paperless document management experience for administrative and academic areas by providing document storage, search automated forms, and workflow capability for active and archived documents

Application development

Build a campus development ecosystem so that application development at the institution can leverage a consistent and contemporary set of capabilities and processes

Data as an institutional asset

Establish institutional administrative data as an asset and facilitate the broadest practical access for university decision makers

- Policy: Develop and advocate an institutional policy framework that clearly delineates and effectively supports the key institutional roles of data owner, data steward and data custodian
- Reporting: Implement a comprehensive reporting infrastructure for the university that effectively meets operating obligations and data needs through an architecture that formally separates transactional, ad-hoc, and longitudinal questions
- Tools: Deploy a family of reporting tools of varying capability and complexity against institutional data so that the community can choose the approach that best meets their needs from application programming interfaces (API) to complex business intelligence or statistical tools



“It is refreshing to work with an IT Leadership Team that understands that the business of enrollment; tours, admissions, financial aid, orientation, and registration depends on effective integration of technology and the solid relationship between the two areas. Simply put, our progress depends on our ability to leverage technology. We look forward to continuing this great partnership and experiencing the positive outcomes associated with it.”

- **Wayne Locust**, Vice President for Enrollment Planning & Management

Goal 4: Pursue IT solutions that assist technical partners at all UConn locations to successfully provide for the specific needs of their respective communities.

Delegation

Enhance distributed IT operating value by increasing realized capability benefits and decreasing actual implementation costs (Figure 1)

Community-building

Participate with the IT community around the shared goal of delivering a high level of service to the University through communication strategies and other community-building activities

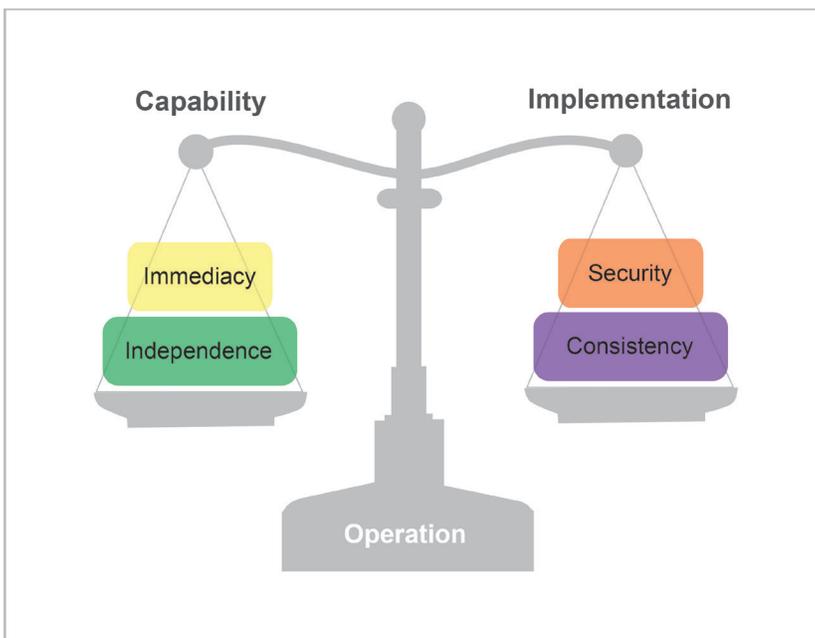


Figure 1. Delegation & Community Building.

To effectively support delegation, UITs must balance competing considerations. The institution values risk mitigation through improved security and improved operating consistency while the community values enhanced capabilities typified by immediate response and individual control.



"The School of Engineering has a vested interest in how information technology is delivered at UConn. As a critical element pillar of our mission, IT enables the engineering faculty to develop and deliver courses, conduct their research, compete for grants, and collaborate effectively with industry, government and global partners. UITs has provided our faculty, students, and staff with a secure and reliable connection of the devices of their choice to coordinated and centralized research, educational and administrative support systems from any location. With this ambitious and yet practical strategic plan, we look forward to an even more productive partnership in the future."

- **Kazem Kazerounian**, Dean and Professor of Mechanical Engineering

Goal 5: Pursue IT solutions that can best be provided centrally and deliver them securely, efficiently, and robustly at scale.

Service

Establish a comprehensive, contemporary framework for systems and capabilities that includes 1) a relationship model (e.g., B2B, B2C); 2) a delivery mechanism (licensing and access); 3) application; 4) infrastructure (network, servers, back-up, and storage); and 5) facilities (power, environmental, footprint, and plant)

The focus of our service model is on providing the best experience for our community while making informed and deliberate decisions about allocation of institutional resources. To deliver this experience and do so securely, efficiently, and robustly at scale, UITs manages a complex set of inter-related components (Figure 2). Through a deep understanding of all levels of the model and their interactions, UITs can better engage in long-term planning for these foundational elements, including a plan for ongoing obsolescence, which involves adhering to the lifecycle of the various components. This approach requires capital planning, discipline, and an ongoing investment in all tiers of our infrastructure, which may not always provide an obvious direct benefit to our community. Communicating about the model encourages productive dialogue around services and provides financial transparency for our community.

Most of our community engages with IT at the application level. We want to enable the community to run their applications, access their files and data, and operate their devices with minimal service disruptions and from a source of their choice. In other words, applications should embody the qualities of contemporary service; they should be always available, immediately useful, self-directed, continuously improved, and incrementally released. Popular and high quality cloud services that have persisted exhibit each of these elements. They deliver capabilities to broad constituencies that are always available and are highly receptive and responsive to customer feedback.

Service Experience

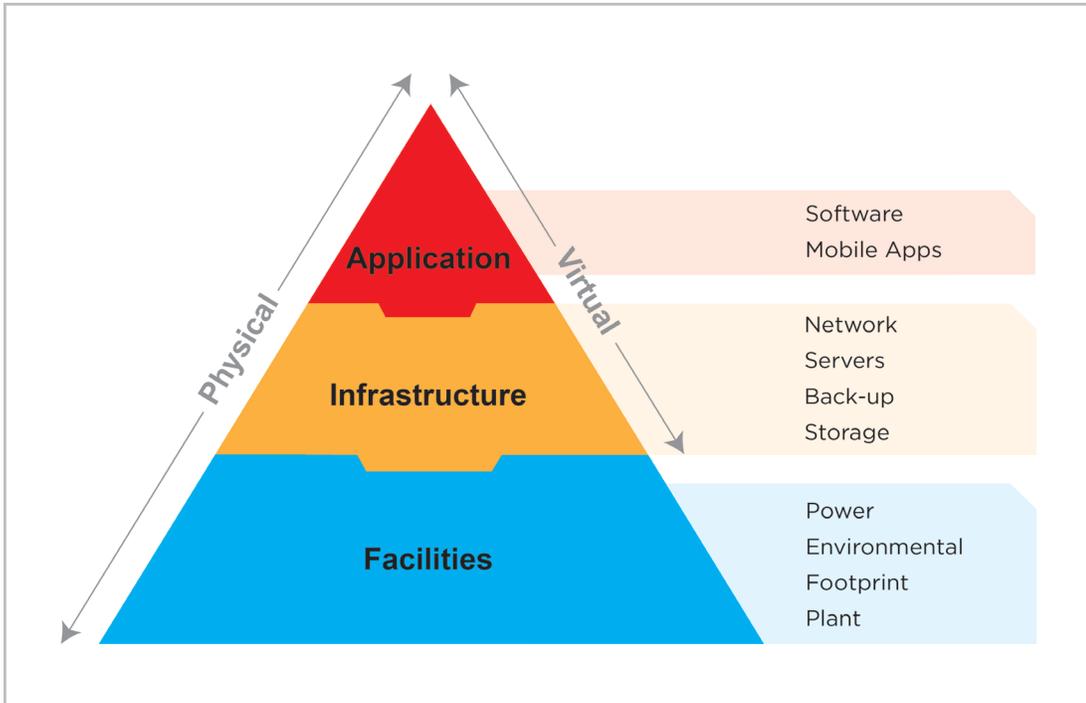


Figure 2. The figure shows the relationship among levels of the infrastructure and how they interact to ensure effective service. Robust infrastructure and facilities, although not always visible to our community, provide a foundation for the application layer. The infrastructure, which includes but is not limited to servers/switches, network cables, and the data center, is housed within one or more facilities and dependent upon its power, environmental controls, and footprint. UITS can deliver all three layers of the model via physical sources and the top two layers through virtual sources.

Sourcing

Select products and approaches that are either internally developed, procured from established vendors, or leveraged from community initiatives that balance the competing benefits of impact, timeliness, value, and control

UITS engages in a rigorous selection process when choosing enterprise-level products that best fit the needs and resource realities of the organization and are vetted through stakeholders, partners, and the community. As a public university, our investments and expenditures are scrutinized, and we use this selection process to internally moderate and externally demonstrate that we are efficient stewards of resources.

Products for our community come from a variety of sources, such as vendors, open source, or internal development. To be selected, the source must meet the following four criteria:

- **History:** A well-established product is more likely to persist and be supported in the future.
- **Market share:** Products delivered by a vendor that have a significant market share are stable and continuously improved. For open sources, this stability comes from community vetting. If the market is highly fragmented, UITS will pursue internal development.
- **Public commitment:** For vendor supplied and open source products, a public commitment to the product translates into long-term support and managed evolution.
- **Intended use:** To ensure the best result for our community, the actual capabilities of the product must align with how we intend to use it.

High availability

Establish a structure that ensures a sustainable, robust, and secure network/infrastructure/data center with the following components:

1. Implementation and operation, including a lifecycle model
2. Location diversity
3. Disaster recovery

Homer Babbidge Library

To establish location diversity, an organization must have at least two geographically independent locations for IT operations. At UConn, the paired data centers are located in the Edward V. Gant Science Complex, our primary site, and Homer Babbidge Library, the secondary site. The two locations and the custom network connectivity between them allows UITS to deliver virtualized services from two independent locations as a single extended offering.



High availability capabilities promote reliability and reduce system downtime and data loss by building redundancy into a system to eliminate single points of failure. In a contemporary IT environment, where people expect continuous access to systems, services, data, and files, a high availability model prepares for possible failures, such as utility outages, equipment malfunctions, and natural disasters, and safeguards against disruptions that will have a negative impact on the community.

IT system and service robustness is best accomplished through a three-tier model. The first tier of the strategy involves establishing sound operating policies and procedures that head-off potential points of failure. It includes a comprehensive plan for a system's lifecycle, which begins with effective implementation of high-quality equipment and systems and continues through timely replacements and updates. The second and third tiers specify procedures to minimize the impact of disruptions with built-in redundancy and to facilitate efficient recovery.

Identity and Access Management

Design and implement a comprehensive and contemporary capability to independently distinguish authentication from authorization and facilitate secure access to applications and data across and between institutions

Identity and Access Management (IAM) protects institutional data and ensures that the correct people have the right level of access to the right information. This process is necessary for maintaining confidentiality, ensuring compliance with federal regulations (e.g., FERPA, HIPAA), and in some cases, satisfying data standards set by funding agencies.

As a gateway to the majority of university systems and applications, IAM must be enhanced to efficiently grant access to systems while accommodating evolving roles, systems, and policies. Current institutional challenges involve delays in turnaround time associated with the identity provisioning lifecycle, inadequate resources for identity authorization, consistency between the multiple identity authorities at the University, and collaboration through identity federation. To address these challenges, UITS will:

- facilitate authorization to protect applications and data
- enhance identity security and assurance via multi-factor authentication
- expedite the identity lifecycle by making parallel many processes which today occur sequentially
- foster collaboration with and between peer institutions by augmenting federation technologies

Our relationship with business operations and dedicated IAM staff allows us to provide IAM services tailored to the present and future needs of the University.

The three main components of IAM are identity, authorization, and authentication. When a person establishes a relationship with UConn (e.g., student, faculty, staff, etc.), a unique identity is assigned. IAM depends on data from the business administration, such as human resources, payroll, and student administration, to create the identity and corresponding descriptive information necessary for the next two steps in the sequential process, authentication and authorization. Authentication is the process of verifying identity by supplying credentials (e.g., username/password), and authorization determines whether access should be granted and to what degree by inspecting identity roles, group memberships, and metadata.

Business and finance

Establish mature business and finance models that accurately and clearly describe the organizational endeavor and provide for both short- and long-term sustainability

A short- and long-term plan for fiscal solvency, efficiency, and sustainability safeguards the University's investment in IT. With this strategy, UITs establishes fully-developed and well-planned models that will create a transparent finance structure that clearly communicates the purpose of charges and investments. This will involve:

- Securing adequate/sustainable operating funding sources to ensure long-term success for all initiatives and identify capital funding sources for large-scale initiatives
- Developing appropriate business models to charge for services, finance models for utility-type services (such as telephone and bandwidth), and chargeback models for optional/customer-directed services

UITs will engage in a process of continuously reassessing and allocating all resources to provide the University with the greatest value.



ACHIEVING GOALS AND STRATEGIES

As UITS pursues achieving the goals and strategies outlined in this plan, we will proceed in a thoughtful, planned way that securely delivers services, opens channels of communication, and remains aligned and relevant to our community.

SECURITY AND DATA

From an institutional perspective, security is a priority and should be considered in every initiative, but IT decisions often strive to find the optimum balance between risk and access. These qualities are in direct opposition. When controls are relaxed to facilitate greater access, this increasing exposure and decreases security. Implementing effective controls to increase security by decreasing exposure invariably comes at the expense of access and usability. The responsibility of central IT is to appropriately select security strategies to appropriately mitigate risk, while ensuring end-users have as much access as practical.

Data is a key institutional asset that must be protected. Without appropriate security controls, the University could jeopardize its capabilities to accept credit cards, may risk fines for data breaches, expose critical research earlier than intended, or put personal data at risk of being compromised. Institutional information security is critical and as a criterion for impact, is integrated into each initiative identified in this plan.

Whether created or maintained by the University, data such as research, academic records or donor records are critical to the institution. Moreover, this data is often subject to state and federal regulations which require that certain security standards are met. How information is managed, controlled, and protected has a significant impact on the delivery of university services. UITS strives to give our community reliable and secure access to the data they need to meet their institutional obligations. Data policies attempt to simultaneously meet the competing interests and perspectives of data owners, data stewards, data custodians, and data customers. As the custodian, UITS provides the infrastructure and operations that make the data available. The stewards, charged by administrators and other decision-makers to run reports, need access to the data in a controlled way that meets their obligations as its steward (i.e., maintain confidentiality). One of the strategies in this plan is to establish a custodial and policy framework that facilitates the broadest practical access to institutional data for university decision-makers but still allows data stewards to meet their existing and future obligations.

COMMUNICATION

The rationale behind some of UITS's decisions, policies, and practices is not always clear to our community. We want our constituents to focus on their experience and ability to perform their institutional tasks and do not always disclose the nuances and considerations behind the service delivery. Although well-intended, this practice can inadvertently create confusion and frustration.

Moving forward, UITS will embed plans for effective communication into our initiatives with the goal of increasing our community's understanding of the proposed initiative, the considerations involved in the adoption and implementation process, and tools and resources available. Through regular and consistent communication, disseminated via channels such as email, Web sites, conferences, and meetings, this approach will increase:

Transparency around our operations, decision- and policy-making, and finance models. For example, one of our strategies is to establish a policy framework that defines the relationship between data custodians, stewards, and decision-makers. By being open about the constraints necessary to ensure security and compliance, our community will understand the reasoning behind the policy and be better able to have a productive dialogue with us around future needs.

Feedback and influence as we request input from our community during the concept phase that precedes adoption and implementation of a new product or service. We will also open channels for general feedback, which will keep us better connected to the needs of our community.

Awareness and use of available tools and resources that UITS owns, supports, and has available for the community. Within identity and access management, for example, UITS has multiple technologies that would enable the exchange of information, normally segregated by institution, both within and outside the University. By promoting these and other UITS-owned technologies with enhanced outreach and documentation, UITS can reach faculty and staff unaware of these and other IT resources and expand our services.

Two communication programs that UITS initiated in 2014 and will continue are the re-designed IT All Staff meetings and IT Smart campaign:

IT All Staff meeting

The IT All Staff meeting was redesigned to build bridges between central IT and the university IT community. These meetings are attended by technical staff from across the university. The meetings are designed around a mini-conference format, and both UITS and non-UITS staff give presentations. The meetings are organized, staged, supported, and executed just like regular conferences and have been well received by the IT community.

IT Smart

UITS began the IT Smart campaign to show our commitment to service. The weekly messages, sent under the name of the CIO to the university IT community, communicate a positive, sensible change UITS made in response to a point of dissatisfaction. These messages demonstrate a culture open to change and in touch with our community.

GOVERNANCE STRUCTURE

In 2014, UITS initiated the IT Partners program, which is a streamlined governance structure consisting of three standing committees. The governance committees are organized around the academic, functional, and technical campus groups to establish clear roles for each group, prevent overlapping effort, and align participants with focus areas. The role of governance is to collectively provide oversight of UITS systems and services and advise the CIO regarding the efficacy of existing or proposed central IT initiatives.

The governance groups have helped shape the focus of the goals and strategies included in this plan. We asked them during planning stages to first identify initiatives that would benefit the University and then rank them by their relevance to their professional needs. Below are the results. These initiatives were incorporated into the plan, and as UITS executes them over the next five-year period, we will develop metrics in conjunction with our governance groups to measure the success of implementation.

Responses to the UITS Strategic Planning survey

IT initiatives are ranked in the order of highest priority (1) to lowest.

Academic partners

- Representing: Faculty as researchers, teachers, and administrators
- Focus: systems and services that facilitate research, teaching, and learning

<i>Relevance to institutional needs</i>	
IT Initiative	Rank
Data-Intensive: Research Storage - Data Management - Analytics	1
Robust and Secure Network: high bandwidth, high availability (GIG U, IPV6, InCommon)	1
Compute-Intensive: High Performance Computing	3
Comprehensive Software Licensing	4
Enhanced High Tech Classrooms	5
Development of IT Language & Costing Models for Grants (Web, Security, Backup, Network, Storage, Securing Online Devices)	5
Robust Wireless for all Classrooms	5
Enhanced Learning Management System	5
Web Site Support for Research	9
Enhanced Teaching with Digital & Social Media	10

<i>Relevance to personal and professional needs</i>	
IT Initiative	Rank
Comprehensive Software Licensing	1
Robust Wireless for all Classrooms	2
Enhanced Learning Management System	3
Robust and Secure Network: high bandwidth, high availability (GIG U, IPV6, InCommon)	3
Data-Intensive: Research Storage - Data Management - Analytics	5
Development of IT Language & Costing Models for Grants (Web, Security, Backup, Network, Storage, Securing Online Devices)	6
Web Site Support for Research	7
Enhanced High Tech Classrooms	8
Compute-Intensive: High Performance Computing	9
Enhanced Teaching with Digital & Social Media	10

Functional Partners

- Representing: Administrators and staff members
- Focus: administrative, financial, and student-related systems

<i>Relevance to institutional needs</i>	
IT Initiative	Rank
Seamless Communication and Collaboration (Mobile Technology, Video Conferencing & Delivery of e-learning, Unified Messaging)	1
Decision Support System - Data Warehouse	2
Service Management System	3
Identity & Access Management	3
Document Management and Imaging	5
Virtual Desktops	6

<i>Relevance to personal and professional needs</i>	
IT Initiative	Rank
Decision Support System - Data Warehouse	1
Document Management and Imaging	2
Seamless Communication and Collaboration (Mobile Technology, Video Conferencing & Delivery of e-learning, Unified Messaging)	2
Identity & Access Management	4
Service Management System	5
Virtual Desktops	6

Technical Partners

- Representing: Distributed IT from campuses, schools, centers, and units
- Focus: systems, infrastructure, and operating processes

<i>Relevance to institutional needs</i>	
IT Initiative	Rank
Robust and Secure Network: high bandwidth, high availability (GIG U, IPV6, InCommon)	1
State of the Art Data Center to avoid unnecessary replication of infrastructure	2
Seamless Communication and Collaboration (Mobile Technology, Video Conferencing & Delivery of e-learning, Unified Messaging)	3
Highly scalable and available platform for computing	4
Centralized Disaster Recovery/ Business Continuity	5

<i>Relevance to personal and professional needs</i>	
IT Initiative	Rank
Robust and Secure Network: high bandwidth, high availability (GIG U, IPV6, InCommon)	1
State of the Art Data Center to avoid unnecessary replication of infrastructure	2
Seamless Communication and Collaboration (Mobile Technology, Video Conferencing & Delivery of e-learning, Unified Messaging)	3
Centralized Disaster Recovery/ Business Continuity	3
Highly scalable and available platform for computing	5

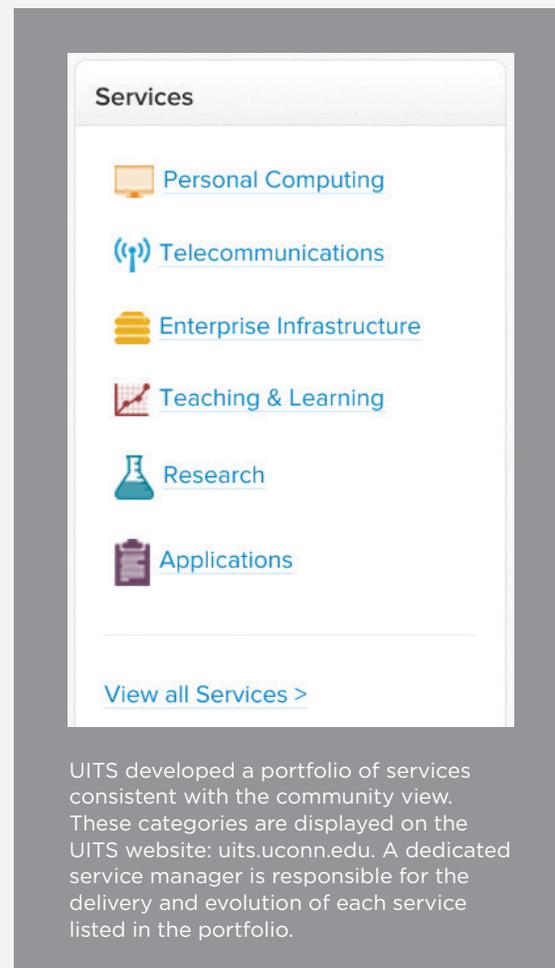
RELATIONSHIP MODELS

Understanding the relationship between services and their communities can help central IT organizations better execute in their key role as an institutional service provider. An IT service is a capability, feature, or benefit that responds to the needs and interests of the community and is delivered within the resource realities of the organization. Either delivered or facilitated by the central IT organization (the provider) to the institutional community (the consumer), all services are defined from the perspective of the consumer and not the provider.

For this reason, UITS developed relationship models around delivery to better align our services with the community perspective. By defining the relationship model, UITS clarifies its role in the service delivery relationship with the consumers, and then this, in turn, guides our communication strategies and organization of staff.

Relationship Models

- **Business-to-Customer (B2C):** This model is typically used to provide generalized central services, provided by UITS (the business), to members of the university community (the customers). B2C is an effective delivery model when the service provided does not require detailed and specific knowledge or expertise and is typically best provided via online information and a help desk.
- **Business-to-Business (B2B):** This model pertains to building block services that are intended to be delivered by UITS to an IT professional. These are constructed to be foundational to the delivery of other services are to be repackaged by the IT professional for consumption by their respective customers.
- **Customer-to-Customer (C2C):** Community-centric services and capabilities are usually delivered using a C2C model, where the provider and consumer are intended to be the same. In this model, UITS is not a provider of the service but rather facilitates an ecosystem where consumers can support each other.
- **Vendor-to-Customer (V2C):** This model is applicable when services are provided externally and consumed internally. UITS acts as the liaison for the relationship.
- **Partner-to-Customer (P2C):** In this model, UITS shares authority, decision rights, and accountability with a functional partner to deliver services to the university community (e.g., HuskyCT, PeopleSoft, and Quali).



The screenshot displays a 'Services' section with a list of categories, each accompanied by a small icon: Personal Computing (computer monitor), Telecommunications (signal tower), Enterprise Infrastructure (server rack), Teaching & Learning (graduation cap), Research (flask), and Applications (document). A 'View all Services >' link is located at the bottom of the list.

UIITS developed a portfolio of services consistent with the community view. These categories are displayed on the UITS website: uits.uconn.edu. A dedicated service manager is responsible for the delivery and evolution of each service listed in the portfolio.

MEASURING SUCCESS

Organizational goals represent high-level descriptions of what it means for UITS to meet its mission obligations. In other words, goals illustrate what success looks like in big picture terms. As such, they are organizing principles without direct actionable components. Strategies are fundamentally architectural and constitute broad approaches to meeting goals. We develop strategies, not to deliver specific goals in and of themselves, but to provide emphasis on an organizing direction to the activities that ultimately will achieve institutional and organizational goals. We distinguish between initiatives and projects only to maintain some semblance of scale. Initiatives are larger in scope and longer in duration than projects. Typically, they are multi-faceted and multi-year. Projects, on the other hand, are more targeted. These are not distinct but rather represent a continuous spectrum from one to the other.

Because goals themselves are the best practical description of organizational success, they are a benchmark against which success metrics are tested. While any single project can be termed a success by demonstrating completion within the key dimensions of scope, schedule, and budget, no project can be utilized to establish organizational success. These are internal metrics of success and are a natural part of assessment. It is the combination of internal metrics (execution assessment) and external metrics (impact assessment) that truly describe the success of the organization (Figure 3).

Throughout the five-year life of this strategic plan, UITS will develop appropriate internal and external success metrics that will lead to adjustment and refinement of our goals, strategies, and initiatives. The University is also in the process of developing their metrics, and UITS will create corresponding assessments to ensure alignment.

Organizational Assessment

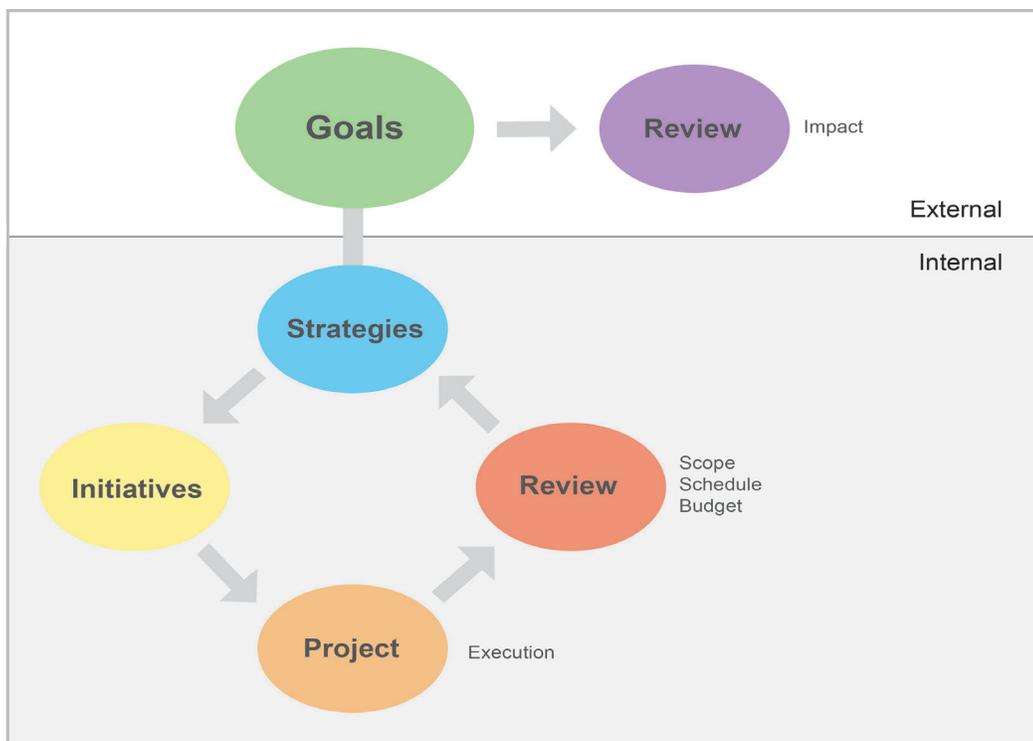


Figure 3: Throughout the five-year life of this strategic plan, UITS will develop appropriate internal and external success metrics that will lead to adjustment and refinement of our goals, strategies, and initiatives. The University is also in the process of developing their metrics, and UITS will create corresponding assessments to ensure alignment.

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