

July
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UD IT STRATEGIC PLAN (2019-2024)

A MULTI-YEAR ROADMAP FOR IT AT UD

INTRODUCTION

Effective information technology is an essential enabler of the University of Delaware's strategic goals and the day to day work of its students, faculty and staff. This plan establishes a multi-year roadmap to support growth in research and innovation, enable academic excellence, improve students' experience and achieve greater operational excellence. Crafted with extensive input from the UD community, the plan provides a framework to set annual priorities and aligns the efforts of UD's IT organizations. Technology strategies are informed by other University initiatives including the Research Information Management Task Force, Data Governance Committee, the emerging Online Learning strategy, and external reviews of technologies and business processes. Realizing the plan will be a collaborative effort of University and college IT groups working in concert with many campus partners in administrative and academic areas. A new IT governance structure will be established to guide the implementation of the strategy and bring further transparency and participation to IT decisions. This document summarizes the plan's goals, strategies and major tactics. The IT governance structure, implementation roadmaps and investment projections are summarized in supporting documents. See Appendix A for a list of Steering Committee members and Advisory Group participants.

CONTEXT FOR PLANNING

UD has many talented IT professionals and a strong technology foundation that has been incrementally improved over the last decade. However, incremental gains are no longer keeping pace with UD's rapidly expanding technology needs. The substantial growth of data intensive research requires more extensive network, storage and computational infrastructure. Furthering academic quality requires improved digital learning technologies and more extensive support services. With an emphasis on operational excellence, new University budget and administrative structures require administrative technologies that are more configurable and conducive to delivering effective services.

Even while setting long-term strategic direction, IT is not standing still. Significant progress has been made by the University to address gaps in applications, upgrade research infrastructure and build organizational capacity to improve execution of projects and services. However, pressing challenges remain that require continued short-term actions and long-term strategy including:

- Insufficient network capabilities to support the rapid movement of large research data sets and enable researchers to move projects efficiently and securely between campus computing resources and cloud-based capabilities;
- Gaps in consultative services and capacity to support the optimal use of research computing infrastructure and broaden its adoption by new faculty and new disciplines;
- Fragmented processes in the planning, funding and managing of learning spaces that create inconsistent capabilities and a lack of some fundamental necessities;
- Instructional design and academic technologies that are well regarded but at an inadequate scale to meet present interest in adopting digital content and learning technologies and creating partially and fully online courses;
- An administrative applications portfolio that is difficult to sustain (e.g., UD Webforms and applications, PeopleSoft customizations), missing important capabilities (e.g., eProcurement, Research Administration), and lacking tools to enable process improvements (e.g., document management); and

- A community of IT organizations that, while increasingly collaborative, lack frameworks and decision-making processes to limit duplicative services and establish a standard set of University-wide capabilities.



STRATEGIC DIRECTIONS

The IT Strategic Plan addresses current challenges and transforms technology to be an asset to research growth, student success and operational effectiveness. The plan consists of four goals each with immediate priorities, supporting strategies, and initiatives.

GOAL: Support Research & Scholarship

The IT plan will deploy technologies and services to enable UD's strategies to increase research and scholarly activity, impact and innovation. UD will deploy a research cyberinfrastructure that facilitates complex, data intensive research. Research networks and partnerships will enable UD researchers to move their compute-intensive projects between on-premises and cloud-based resources. Expanded research computing services and data management expertise will encourage more faculty to apply research technologies to their work and maximize time available to focus on



their scholarship. Improved consultative services will enable faculty in all disciplines to leverage IT capabilities, such as high performance computing (HPC) or data visualization, in their scholarship.

1. *Provide high speed network connectivity from UD research sites to national labs, supercomputing centers and regional and national institutional collaborators.*

- Complete upgrade of on-campus networks to begin providing secure 100GB connection speeds to research labs.
- Optimize a portion of the campus network for high performance scientific applications (Science DMZ).
- Increase connection speeds to Internet2.
- Partner with a regional networking group such as NYSERNET to create high speed research networks between UD and its research partners in the mid-Atlantic and Northeast.

PRIORITIES

Complete network upgrade to secure 100GB connection speeds
Hire Director Research Cyberinfrastructure
Appoint Research IT Advisory Committee
Create a website to present Research IT Services

2. *Leverage improved campus cyberinfrastructure and cloud resources to provide a continuum of high performance computing and data storage capabilities.*

- Expand the capacity of the HPC clusters by facilitating partnerships with interested faculty to co-invest in HPC clusters and to transition their research from departmentally based resources into the shared HPC environment.
- Collaborate with the University Library and Research Information Management Task Force to design and implement tiered storage solutions to support information management life-cycle needs.
- Establish configurations (e.g., containers) in the UD HPC environment that parallel national resource, such as XSEDE, to facilitate the transfer of research projects between environments.
- Partner with cloud providers, including Amazon and Microsoft, to develop secure network pathways, pre-negotiated contract terms, and convenient payment vehicles to facilitate using cloud resources as an extension of on-campus resources.
- Develop advisory services to assist faculty less experienced in leveraging computational resources in their scholarship to assess, plan and implement cloud resources.

3. *Expand research computing support services to maximize the time researchers and graduate students can spend advancing their research and scholarship and to broaden adoption of the research cyberinfrastructure to more faculty and disciplines including the social sciences, humanities and the arts.*

- Hire a Director of Research Cyberinfrastructure to collaborate with the Data Science Institute, the HPC research community, the Library and other stakeholders to develop UD's research technology services.
- Provide application development support to assist faculty to optimize custom programs and algorithms for campus and cloud-based high performance computing environments.
- Develop and deliver training programs in multiple modalities (e.g., workshops, online) to assist faculty and students to use the cluster and broadly applicable scientific software.

- Improve communication, create service catalogs and expand outreach to faculty and students to facilitate discovery of UD's full range of research computing infrastructure, data sets, scientific applications and services.
- Expand support services to facilitate use of research cyberinfrastructure in faculty scholarship in social sciences, arts and humanities.
- Establish research liaisons to each college to promote awareness of research IT capabilities across the University and facilitate access to services.

4. *Establish funding and governance practices to make research computing services responsive to the needs of the research community, sustainable, and widely utilized.*

- Establish a faculty led research IT committee to recommend new initiatives, govern the use of shared research computing facilities and advocate for the needs of UD researchers.
- Create a core set of University funded research computing services that provides faculty and students conducting research with access to a foundational level of computing, storage and research software.
- Assist faculty with developing grant proposals and securing appropriate funding to utilize campus cyberinfrastructure.
- Evaluate options to fund the on-going maintenance and upgrade of the research IT infrastructure and select an option that best promotes access and adoption and sustains the level of capability required by faculty and students.

GOAL: Facilitate Improved Student Learning and Success

In conjunction with campus partners, the IT plan improves physical and virtual learning spaces and provides faculty with support to adopt digital learning technologies that are broader and more multi-disciplinary. The plan lays the technology and services foundation to support the academic strategy for online learning. Extended outreach will help more faculty and students discover digital learning capabilities. Innovation incubation programs will help early adopters evaluate emerging technologies and deploy new pedagogies. Integrated facilities and technology planning



will improve baseline classroom capabilities and reflect innovations in learning space technologies in the campus master plan.

1. Build on the strong foundation of the Faculty Commons to create multi-expertise capabilities that enable sustained faculty engagement with comprehensive course development, instructional design and technology support services.

- Establish an effective entry point to quickly connect faculty to expanded digital learning support services and expertise including assessment of services, course design and program development, researching new instructional technologies, project management and market research.
- Establish a flexible staffing model with contributed expertise from multiple organizations including the Library, Center for Teaching and Learning, UD IT, and Institutional Research and Effectiveness.
- Create experimental spaces, innovation grants and research and development support as a proving ground for faculty to pilot new pedagogy and technologies and become a pipeline for changes to learning spaces campus-wide.
- Establish a multi-faceted communication program to share information about teaching with technology and promote engagement with groups. Elements of the program could include a web site, video presentations (e.g., Ted talks), faculty ambassadors and events.

PRIORITIES

Form a learning space governance committee
Implement a common framework to assess classroom conditions
Address rooms with acute needs for improved foundational capabilities
Expand instructional design capacity

2. Support the University's future online learning strategy with expanded course design and program development services.

- Create additional instructional design capacity to assist faculty to design and develop online courses and reduce reliance on third-party partners.
- Partner with faculty to select and implement a quality rubric for online courses.
- Develop a strategy to provide 24x7 access to support services for online learners and instructors.
- Work collaboratively with the Office of the Provost to focus online course development resources on programs and courses selected by the faculty to be redesigned to improve learning outcomes, alleviate enrollment bottlenecks that impede time to graduation, or reduce students' costs for curricular materials.

3. Devise a learning space master plan that promotes flexible room designs, supports varied pedagogies, and improves foundational capabilities important to the learning experience, and usability of all spaces.

- Implement a consistent method to evaluate the condition and capabilities of all UD learning spaces (Registrar and College controlled) such as the EDUCAUSE Learning Space Rating System. Use the space condition inventory to establish the need and priority for investment in room maintenance and upgrades.
- In partnership with FREAS and the Registrar, establish an integrated process to plan and fund the renovation of the physical, technological, media and furnishings in classrooms and collaboration spaces.

- Invest in foundational capabilities including writing surfaces, access to power, sound quality and video display in classrooms and student collaboration spaces.
- Form a learning space governance committee of faculty, students and staff to recommend learning space standards, sponsor assessments of quality and satisfaction, and evaluate emerging needs.

4. *Create innovative spaces to leverage digital technologies in concert with the campus master plan.*

- Create more physical spaces for collaborations supported with robust wireless networks, display screens and online applications and content.
- Design additional spaces to support problem-based learning and facilitate students and instructors participating in-person and online.
- Anticipate more students and faculty bringing their own computing devices to campus with enhanced access to virtual software and decrease reliance on dedicated spaces for general purpose computer labs and classrooms.
- Support Colleges to incorporate innovations into the design of specialized learning spaces that can be evaluated for potential migration to all spaces.

GOAL: Enable Administrative Excellence

The IT plan sets a roadmap for the core administrative technologies that support student and administrative services and enables operational excellence. By approximately 2027, the University's major administrative technology, PeopleSoft, will be phased out by its vendor. As this date approaches, the software will become more costly to maintain and fall further behind leading capabilities and practices. This goal sets a roadmap to upgrade PeopleSoft and address acute gaps in other administrative technologies. It prepares the University to move to the next generation of student information (SIS) and enterprise administrative systems (ERP). Strategies create the technological and organizational capacity to streamline processes and enhance user experiences with digital services.

1. *Improve the student experience and lay the groundwork for the next generation of student information systems and constituent relationship management (CRM) strategies.*

- Expand the student services available through mobile applications or web sites.



- Devise a student support and CRM technology strategy to better understand student interests, track their engagement and tailor outreach efforts throughout the student life-cycle.
- Improve information sharing between disparate applications that track student interest and engagement.
- Implement shared solutions for document management, optical character recognition and chat bots across student service areas.
- Develop strategies to leverage mobile devices or campus card to improve methods to access services and record student engagement.

2. Close critical capability gaps and extend the life of the current PeopleSoft implementation through targeted implementation of specialized applications.

- Strengthen foundational capabilities that support all administrative services by implementing solutions for identity and access management, business intelligence and reporting, and mobile application development.
- Support improved efficiency and effective compliance by implementing an electronic research administration system.
- Enable more efficient online processes in finance and human resources by deploying a staff recruiting application and evaluating the cost/benefit of implementing targeted technologies to support employee relations and online commerce (e-procurement) solutions as bridges to the next generation ERP solution.

PRIORITIES

Implement improved solutions for budget, recruiting, identity management, and BI
Select a document management solution
Develop business analyst capabilities across UD
Create business process improvements in HR, Research

3. Deploy business intelligence capabilities to improve transactional reporting and enable advanced analytics.

- Support the work of the Office of Institutional Effectiveness and the data governance to improve data management and use.
- Provide improved tools to facilitate ad hoc transactional reporting.
- Deploy HelioCampus as a Business Intelligence platform for advanced analytics.
- Create a data strategy to improve the integration of data among existing and future transactional systems and the BI platform.

4. Replace the ERP by 2023 and the student information system by 2025.

- Prepare for implementation of modern, highly configurable, software as a service solution by developing additional business analyst capabilities and streamlining processes.
- Continue to monitor the maturation of new software solutions to confirm the timing of the replacement strategy and to determine if it's advantageous to select the same solution for both ERP and student systems (SIS).
- Develop a long-range financial plan to fund one-time and recurring investments and reallocate any off-setting savings to transition to the new ERP and SIS.
- Define requirements and undertake a structured selection of the new ERP in 2020 and for the SIS in 2021.

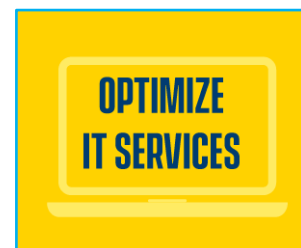
- Charge administrative and student systems sub-committees within the new IT governance structure to monitor the long-term replacement roadmap and to evaluate major investments in applications that could potentially overlap with, or detract from, the long-term replacement strategy.

5. *Support the redesign of business processes, invest in new technology systems that support improved business processes, and reduce the complexity of the current application portfolio.*

- Select processes for redesign based on organizational assessments and results of cost/benefit analyses completed that considers overall timing of ERP replacement.
- Develop additional business analyst capabilities and competencies in UD IT and other administrative units.
- Simplify or retire complex Peoplesoft customizations that can be replaced with vendor-maintained functionality (e.g., asset management, tracking individuals with multiple jobs, leave tracking).
- Deploy a document management and workflow solution to support paperless processes and more effective document retention strategies.
- Redesign human resources and finance business processes and adopt PeopleSoft delivered capabilities to reduce reliance on UD Web Forms and other applications.
- Invest in an easy-to-use promotion and tenure capability.
- Streamline effort certification and proposal submission associated with sponsored research.

GOAL: Optimize IT Services

To further operational excellence, the IT plan also introduces mechanisms to improve existing IT services and creates a framework to better organize responsibility for services among IT organizations. Strategies to optimize IT services create efficiencies, provide a more consistent service experience for faculty and students, and reduce information security risks. Most importantly, this goal creates transparent mechanisms to govern services to promote accountability and establish trust in University-wide IT services.



1. *Adopt a structured framework for categorizing IT services and determining the optimal structure for managing the service.*

- Categorize services as core, consortium or specialized.
- Core services will be available to all members of the University community, funded “off the top” through a University budget allocation, and available at a consistent level of quality and performance throughout the institution.
- Core services does not necessarily mean UD IT is the provider. Each service will be operated or arranged by the UD organization most appropriately situated to manage it effectively.
- IT Governance will determine when use of a core service should be mandated and how to allocate the costs of fulfilling

PRIORITIES

Implement IT governance
Implement service catalog
Develop detailed service descriptions, funding plans, and implementation plans for initial core services.

demonstrable needs for premium capabilities that supplement a core offering.

Type	Attributes
Core	<p>Widely needed by most and available to all</p> <p>Consistent levels of service required</p> <p>More cost effective to offer as core or produces considerable efficiencies for users of the service</p> <p>Strategic to make consistently available</p> <p>Critical to University operations to maintain consistent, quality service</p> <p>Service is more valuable if widely adopted</p>
Consortium	<p>Needed by many; available at discretion of the consortium</p> <p>More efficient to operate once on behalf of all</p> <p>Important to consortium to maintain consistent, quality service</p> <p>Requires an agility and responsiveness best met by tailoring the service for a smaller group of users</p>
Specialized	<p>Needed by few and in specific areas</p> <p>Limited economies of scale or specialized skills required</p> <p>Priority of users to maintain consistent, quality service</p> <p>Requires an agility and responsiveness best met by localizing the service</p>

2. *Begin the transition to core services with a focus on major enterprise technologies (e.g. learning management system), critical infrastructure, accessibility and security technologies.*

- In future phases, expand the core services to include communication technologies, personal productivity, web site management and aspects of user support. (see Appendix B)
- Initiate implementation by developing detailed definitions of the scope of each core service and confirming required service levels.
- As necessary work with departments through annual planning and budgeting processes to phase out local services that will be replaced by a core services and restructure budgets to provide funding to sustain the core services.

3. *Establish structured governance and service management processes to provide oversight for core services and facilitate continual improvement of all services.*

- Continue implementing a shared terminology and naming convention for IT services across all IT groups at the University.
- Establish a shared service catalog to communicate the availability of services to constituents.
- Complete the selection and implementation of a consistent software solution for ticketing and service management.
- Create an IT services sub-committee within IT governance to oversee processes to propose new core services and to sponsor assessment of existing core services.

4. *Develop the IT workforce required for the future.*

- Devise structured professional development plans for all central and distributed IT staff that extend both technical and non-technical skills.
- Define alternative career paths for staff that provide opportunities to focus on tracks leading to management and technical expertise.
- Devise more nimble recruitment strategies and create more opportunities for student workers, recent graduates and UD staff moving among IT organizations.

- Create a workplace for all IT staff that values diversity and inclusion.

ALIGNMENT

The illustration in Appendix D presents the alignment of the strategic IT goals in relation to the 2016 Assessment of IT at UD and University goals they support.

IMPLEMENTATION

Selective implementation of the IT plan began while the planning process was underway. While important groundwork has been laid, multiple initiatives are underway to address immediate implementation priorities and create the organizational capacity needed to execute the strategies proposed. Full implementation of the IT plan will occur over three to five years. Roadmaps for implementation of each major goal, available in a separate document, serve as a starting point for sequencing priorities. A summary of investment requirements and benefits is being prepared to support major strategies including expanding the research computing infrastructure, the long-term transition of administrative systems and the upgrade of learning space technologies.

A major step in implementation will be the creation of the new IT governance structure (Appendix C). A major role of IT governance is to monitor implementation, seed thinking about new initiatives and alter strategies as the environment changes. This will assure the plan is a living document that actively informs decisions. An Executive IT Council and an IT Governance Steering Committee will be appointed in 2019 along with several domain specific advisory groups. UD IT has already begun work to establish a project management office and processes to gather the information committees will need to do their work. A detailed description of the governance structure and committee charges will be available on the UD IT website (www.udel.edu/it).

Table 1 – Summary of Strategies

GOAL: Support Research & Scholarship	GOAL: Facilitate Improved Student Learning and Success
<ol style="list-style-type: none"> 1. Provide high speed network connectivity from UD research sites to national labs, supercomputing centers and regional and national institutional collaborators. 2. Leverage improved campus cyberinfrastructure and cloud resources to provide researchers with a continuum of high performance computing and data storage capabilities. 3. Expand research computing support services to maximize the time researchers and graduate students can spend advancing their research and scholarship and to broaden adoption of the research cyberinfrastructure to more faculty and disciplines including the social sciences, humanities and the arts. 4. Establish funding and governance practices to make research computing services responsive to the needs of the research community, sustainable, and widely utilized. 	<ol style="list-style-type: none"> 1. Build on the strong foundation of the Faculty Commons to create multi-expertise capabilities that enable sustained faculty engagement with comprehensive program and course development, instructional design and technology support services. 2. Support the University's online learning strategy with expanded course design and development services. 3. Devise a learning space master plan that promotes flexible room designs, supports varied pedagogies, and improves foundational capabilities important to the learning experience, and usability of all spaces. 4. Reflect the impact of digital technologies on learning spaces in the campus master plan.
GOAL: Enable Administrative Excellence	GOAL: Optimize IT Services
<ol style="list-style-type: none"> 1. Improve the student experience and lay the groundwork for the next generation of student information systems and constituent relationship management (CRM) strategies. 2. Close critical capability gaps and extend the life of the current PeopleSoft implementation through targeted implementation of specialized applications. 3. Deploy business intelligence capabilities to improve transactional reporting and enable advanced analytics. 4. Replace the ERP by 2023 and the student information system by 2025. 5. Support the redesign of business processes, invest in new technology systems that support improved business processes, and reduce the complexity of the current application portfolio. 	<ol style="list-style-type: none"> 1. Adopt a structured framework for categorizing IT services and determining the optimal structure for managing the service. 2. Begin the transition to core services with a focus on major enterprise technologies (e.g. learning management system), critical infrastructure, accessibility, and security technologies. 3. Establish structured governance and service management processes to provide oversight for core services and facilitate continual improvement of all services. 4. Develop the IT workforce required for the future.

APPENDIX A:

IT Governance Steering Committee and Advisory Group Members

The IT Governance Steering Committee is comprised of:

- Chief Budget Officer
- College Deans
- Vice Provost for Libraries and Museums
- Faculty Senate Representative
- Vice President Research, Scholarship and Innovation
- Vice President Finance
- Vice President Human Resources
- Vice President Enrollment Management
- Vice President Information Technologies and CIO
- Associate Vice President IT Strategic Operations
- Associate Vice President Office of Institutional Research and Effectiveness
- Vice President Facilities, Real Estate and Auxiliary Services
- Vice President and General Counsel

Advisory Group membership is comprised of a broad cross-section of technology, administrative, and operational staff who broadly represent the University's need. Groups represent the functional domains administrative systems, student experience, IT services, research computing, architecture, and security and IT risk. At the direction of the IT Governance Steering Committee, ad hoc committees may be formed.

APPENDIX B:

Phase I Core Services

- Identity and Access Management
- Learning Management System
- Finance, Human Resources and Student information Systems
- Accessibility technologies and training
- Security technologies, monitoring and training
- Voice and data networks (wired and wireless)
- Software license management
- Website hosting
- Document management

Appendix C: IT Governance Structure



Appendix D:

Alignment of Strategic IT Goals

	IT STRATEGIC PLAN GOALS			
	Optimize IT Services	Enable Administrative Excellence	Support Research & Scholarship	Facilitate Learning
UNIVERSITY GOALS				
Operational Excellence	√	√		
Student Success	√		√	√
Research & Scholarship			√	
Innovation & Entrepreneurship	√		√	√
High Impact Facilities			√	√
Online Learning			√	√
2016 ASSESSMENT OF IT AT UD				
Infrastructure and Core Services	√			
Organization And Personnel		√		
Strategic Planning, Execution and Relationship Management	√	√		
Security and Risk		√		
Research			√	
Teaching and Learning			√	√