

# HARVARD UNIVERSITY



## **University Information Technology Strategic Plan**

**2018**

## Letter from Harvard's CIO Council

Dear Colleagues,

In 2012, the CIO Council defined—for the first time—a shared vision for IT at Harvard and a unified Strategic Plan to guide our collective efforts. The plan outlined a bold set of initiatives that taken together aimed to transform, modernize, and greatly simplify our IT landscape.

Of the inaugural plan's 16 key initiatives, all have launched and all but two will be completed by the end of summer. It's an impressive list of accomplishments. Through major technology implementations, including Canvas and my.harvard, our faculty and students now have access to best-in-class technology. University-wide efforts to establish shared platforms including HarvardKey, Harvard Phone, and Office 365, have made it easier for the Harvard community to get their work done in a secure environment, independent of their location or preferred device. And efforts like moving Harvard to the cloud are paving the way for greater technology integration, optimization, and automation.

Having accomplished so much of what we set out to do in 2012, the CIO Council felt it was time to develop the next iteration of the IT Strategic Plan—to anticipate and support the evolving needs of our multi-campus University, and help focus our efforts over the next three years.

Through eight new CIO Council Initiatives and eight University IT Priorities that represent areas of continued investment, we are poised to build on our past successes and work with our University partners to tackle new challenges that we only now have the necessary foundational elements in place to support.

This plan represents not just a direction for the Harvard IT community, but also establishes what the community can expect from the CIO Council over the next few years. We are pledging to move forward on these initiatives and priorities and hold ourselves accountable to our ambitious aims.

It's going to be a lot of work – but there's no one we'd rather accomplish it with than the IT workforce here at Harvard. It is with deep thanks and appreciation to the Harvard IT community that we present the 2018 IT Strategic Plan.

Sincerely,

The CIO Council

## Overview

In 2012, Harvard's CIO Council, charged with leading and advancing University-wide Information Technology (IT) strategies, policies, and standards, developed the University's IT Strategic Plan to define a vision and priorities on which Harvard's schools and Central Administration could collaborate. The plan outlined 16 key initiatives to address the demand for enhanced IT capabilities in support of Harvard's mission. At the time, the CIO Council acknowledged that the plan was ambitious, but also recognized the importance of each of the 16 initiatives.

Five years later, having launched all 16 initiatives, the CIO Council has established a critical IT foundation for the University. Through major technology implementations, including Canvas and my.harvard, Harvard faculty and students now have access to best-in-class technology. And University-wide efforts to establish shared platforms, including HarvardKey and Office 365, have made it easier for the Harvard community to get their work done and to work together.

Given the success of the previous plan and the new challenges that lay ahead, the CIO Council acknowledged it was time to develop a new IT Strategic Plan for the University to set a direction for the next three years. To that end, the CIO Council established a working group in the summer of 2017 to gather input and develop the next plan. The working group met bi-weekly over the course of the summer and fall to consider input from the Harvard community and identify Harvard priorities and overall trends in higher education and technology, and to ensure this new information was sufficiently integrated into the Strategic Plan.

This report summarizes both the deliberations of the working group and the updated IT Strategic Plan for Harvard University.

## Harvard Context

In updating the plan, the working group felt it was critical for the plan to be aligned with the academic and business priorities of the broader University. To gather those perspectives, the working group gathered input from a diverse set of sources across Harvard, including interviews with administrative deans and vice provosts. Those conversations focused both on organizational priorities and how IT could enable and support them. This collective input became the foundation on which we built the plan.

Through those conversations, the working group captured a number of recurring themes that highlight Harvard priorities and have implications for how we think about and deploy technology.

### **Developing the Classroom of the Future**

Ensuring Harvard classrooms have the technology to support the future of digital learning, including incorporating research technology, varied digital content, and distance learning.

### **Extending the University's Reach**

Broadening the University's reach through formal programs and other one-time events. Supporting the rapid growth of Harvard's Executive and Extended Education programs.

### **Supporting Faculty Endeavors**

Evolving and improving support for faculty in both teaching and research. Supporting the growing demand for research computing resources.

### **Enabling One Harvard**

Continuing to identify and pursue opportunities to collaborate across the University. Removing barriers to collaboration and facilitating knowledge and best practice sharing.

### **Driving Efficiency**

Making it easier for members of the Harvard community to do their work by simplifying the user experience and providing standard tools.

### **Investing in Foundational Strategies**

Continuing to address critical foundational strategies, including information security and IT workforce development.

## **Updated IT Strategic Plan**

Taking all of the above together, the CIO Council has identified a set of initiatives and priorities to shape its work together over the next three years.

### *Vision for IT at Harvard*

In 2012, the CIO Council developed a vision for Harvard IT that was specifically targeted to the IT community. Its main purpose was to inspire the IT community to get the 1,400 IT professionals working across the University “rowing” in the same direction. More importantly, the vision helped IT professionals understand the role they play at the University.

The working group revisited the vision, and revised it slightly. In considering modifications, we retained focus on access, innovation, and collaboration, but added a focus on administration as well. While the three existing elements have relevance to administration, the working group believed they did not put enough emphasis on the importance of technology in improving our administration and operations.

## **University IT Vision**

**Empower the Harvard community through technology that enables:**

- **Effortless access** to data, information, and knowledge
- **Rapid and profound innovation** in teaching, learning, and research
- **Seamless collaboration** across communities and disciplines
- **Effective and efficient administration**

We continue to recognize that the vision can serve a dual purpose: While it establishes an ideal toward which the IT community should strive, the vision also communicates to the community what it should expect from the CIO Council, holding us accountable to our own ambitious aims.

## Guiding Framework

For the updated plan, the working group created a guiding framework to help our team better understand which initiatives and priorities should be included in the plan. In order to be included in the University IT Strategic Plan, initiatives and priorities needed to:

- Support the University IT Vision
- Address either a pain point or emerging opportunity
- Have widespread impact across the University

These principles helped the working group to assess different investment areas and ensure we utilized a common framework.

## CIO Council Strategic Initiatives and Priorities

Turning our attention to the actual work to be done, the working group determined that there are two types of activities that should be included in the plan.

CIO Council Initiatives	University IT Priorities
CIO Council Initiatives represent new distinct projects that require the CIO Council to work together, typically related to developing a new strategy or implementing a new technology.	University IT Priorities require continued attention from the CIO Council to ensure ongoing operations and improvements.

The working group identified eight CIO Council Initiatives that represent new distinct projects requiring the CIO Council to work together.

CIO Council Initiatives
<p><b>1. Collaboration</b> Develop and implement a strategy for the next set of collaboration tools, including video conferencing and directory strategies to improve ability to work within the University and with external partners.</p>
<p><b>2. Executive and Extended Education Support</b> In partnership with the Executive and Extended Education community, identify and implement common administrative and delivery systems to facilitate knowledge sharing and to leverage shared investment.</p>
<p><b>3. Digital Content Infrastructure</b> In partnership with the Library, develop the infrastructure to support digital content, including digital asset management and storage, to improve University-wide ability to access and use Harvard's digital content.</p>
<p><b>4. Alumni Systems</b> In partnership with AA&amp;D and school development offices, develop a University-wide approach for replacing alumni systems, including ADVANCE, that addresses data management and governance, to support alumni engagement and solicitation activities across the University.</p>

**5. In-Classroom Technology**

Determine what, if any, technology standards and solutions should be consistent across the University and implement those standards and solutions so that teaching staff has greater consistency and better ease of use.

**6. Administrative Data Management**

Pursue the next phase of Administrative Data Management to improve quality and usability of Harvard's administrative data.

**7. User Experience**

Execute strategy to enhance user experience to improve ease of access to and use of Harvard's systems and information.

**8. Operational Technology**

In partnership with facilities community, clarify policies and support model for operational technology across the University to mitigate risk.

The working group also added a new category of work focused on identifying important IT-related priorities for the University that require continued focus from the CIO Council. These priorities do not have a start and end date, but rather represent areas where ongoing operational support and improvements are critical. The working group identified eight University IT Priorities.

## University IT Priorities

**1. Information Security**

Continue to invest in information security efforts related to awareness, risk assessment, and operations.

**2. Enterprise Architecture**

Define and encourage adoption of a University-wide enterprise architecture consisting of technical principles, standards, and supporting resources.

**3. Shared Service Model**

Evolve and refine the shared service model and service delivery.

**4. Research Computing and Research Data Compliance**

Support the Research Computing Council in driving alignment across research computing groups and improve support for research data compliance.

**5. IT Workforce Development**

Continue to invest in IT workforce development through IT Academy, diversity and inclusion efforts, and the IT Fellows Program.

**6. IT Procurement and Vendor Management**

Continue to identify and pursue opportunities to simplify and streamline IT purchasing.

**7. Change Management**

Improve ability to deliver projects and programs to the community through best practices and training related to change management and business process assessment.

**8. Sustainability and Green IT**

Support Harvard's sustainability efforts focusing on reducing e-waste and rolling out managed print services.

**Next Steps**

The University IT Strategic Plan will be actively distributed and promoted across the University to ensure that the vision and anticipated benefits identified are realized. The plan will continue to serve as a driver of enterprise IT vision and strategy, and will be updated as necessary to respond to changing technologies and evolving community needs. The CIO Council will initiate a formal review of the plan during the summer of 2019.

**Concluding Thoughts**

The CIO Council is honored to take up the work described in this report, and we feel privileged to work with one another in support of Harvard's mission. We continue to be both excited and challenged by the transformative potential of the digital age and its promise to dramatically advance learning, teaching, and research at Harvard. Most of all, we look forward to bringing our collective technology resources to bear on the University's priorities as it enters its fifth, and perhaps most formidable, century.

## Appendix A: Detail on CIO Council Initiatives

CIO COUNCIL INITIATIVE WORKING DEFINITIONS	
<b>Collaboration</b>	<ul style="list-style-type: none"> <li>• Host Collaboration Summit to develop University strategy for collaboration tools</li> <li>• Explore opportunities to standardize around video conferencing and directory services</li> </ul>
<b>Executive and Extended Education Support</b>	<ul style="list-style-type: none"> <li>• Develop approach to managing identities for Exec and Extended Ed communities (replace XID)</li> <li>• Explore opportunities to leverage shared approach to marketing automation</li> <li>• Identify and implement administrative systems to support online learning (payment processing, salesforce, etc.)</li> <li>• Identify delivery systems needed to support evolving needs (studios, canvas, online technology)</li> </ul>
<b>Digital Content Infra-structure</b>	<ul style="list-style-type: none"> <li>• Partner with library to develop strategy for Digital Content Infrastructure</li> <li>• Develop a shared framework and definitions for Digital Asset Management</li> <li>• Scope project, identifying low-hanging opportunities and extreme pain points</li> </ul>
<b>Alumni Systems</b>	<ul style="list-style-type: none"> <li>• Improve data management (master data management governance, school-specific reporting)</li> <li>• Develop University-wide approach for replacing alumni portfolio (including ADVANCE)</li> <li>• Implement and roll out new solution(s) (prospect management, gift management, CRM)</li> </ul>
<b>In-Classroom Technology</b>	<ul style="list-style-type: none"> <li>• Re-evaluate common approach to classroom video: identify central services, revisit platform choices, assess classroom video conferencing needs</li> <li>• Optimize investment in Crestron Programming through VMO efforts, exploring standardized look and feel (skinning, naming, terminology) and pool of programmers</li> <li>• Move toward shared standards, beginning with focus on FAS, SEAS and Allston</li> </ul>
<b>Administrative Data Management</b>	<ul style="list-style-type: none"> <li>• Develop University strategy for administrative data management, scoping and prioritizing different opportunities</li> <li>• Assess and prioritize opportunities related to better supporting reporting, clarifying data flows, standardizing data (e.g. Entity names), streamlining records management</li> </ul>
<b>User Experience</b>	<ul style="list-style-type: none"> <li>• Develop University User Experience Strategy, including framework and principles</li> <li>• Strengthen the UX community</li> <li>• Prioritize UX for applications to focus on systems with the greatest impact across the University</li> </ul>
<b>Operational Technology</b>	<ul style="list-style-type: none"> <li>• Identify where the CIOC can provide value to mitigate risk</li> <li>• Develop support model and policies for operational technology across the University.</li> <li>• Formalize model for collaboration with facilities community</li> <li>• Evolve network strategy to account for operational technology</li> </ul>



## Appendix B: 2012 Strategic Plan

In 2012, Harvard’s CIO Council, charged with leading and advancing University-wide Information Technology (IT) strategies, policies, and standards, developed the University’s first-ever IT Strategic Plan. Intended to define a vision and priorities on which the various schools could collaborate, the plan outlined 16 key initiatives to address the demand for enhanced IT capabilities in support of Harvard’s mission.



The plan was revised in 2015 to reflect necessary enhancements, and address new and critical needs. Initiatives were placed in three high-level categories:




- **Technologies:** Initiatives to support teaching & learning, research, and administration
- **Common platforms:** Platforms we build together
- **Foundational strategies:** Strategies to guide all of work

Technologies <i>Initiatives to support teaching &amp; learning, research, and administration</i>				
Teaching and Learning		Research		Administration
1. Teaching and Learning Technologies		3. Online Access to Harvard’s Scholarship and Knowledge		5. Student Information System
2. Data for Learning Analytics		4. Big Data for Research (Infrastructure & IT Organization)		6. Access to Institutional Data and Systems Integration
Common Platforms <i>Platforms we build together</i>				
7. Video	8. Unified Communications	9. Collaboration Tools	10. Cloud	11. Identity and Access Management
Foundational Strategies <i>Strategies to guide all of our work</i>				
12. Enterprise Architecture	13. Information Security	14. IT Business Continuity / Disaster Recovery	15. User Experience, Mobile, & Accessibility	16. Vendor Management

As of the conclusion of FY17, all 16 initiatives have been either completed or launched.

## Status of 2012 Strategic Initiatives (as of May 2018)

Technologies	Teaching & Learning	<p><b>1. Teaching and Learning Technologies</b> A set of faculty-friendly, student-focused technologies that support teaching and learning across all Harvard schools, facilitate pedagogical innovation, and contribute to educational research.</p>	<p><b>FY14-FY16 Complete</b> Canvas to all Schools; pedagogical innovation via HarvardX and VPAL; establish strong TLT community; cultivate open source community</p>	
		<p><b>2. Data for Learning Analytics</b> Seamless access to data and the strategies and tools to employ data to improve learning outcomes, enhance teaching and learning research, and inform policy and governance decisions</p>	<p><b>FY16-FY17 Complete</b> Build infrastructure to integrate and share learning analytics data (edX, Canvas, Mediasites); develop and document a sustainable learning analytics data service</p>	
	Research	<p><b>3. Online Access to Harvard's Scholarship and Knowledge</b> Easy and open global access to Harvard's research, scholarship, and knowledge.</p>	<p><b>FY16 Discovery complete, will not proceed</b> Develop tools for online access and discovery; support storage, dissemination, and preservation of Harvard-based scholarship and research; develop methods and technology to organize, store, and preserve research data</p>	
		<p><b>4. Big Data for Research</b> A robust, scalable, and sustainable technology foundation and IT skills to ensure Harvard's ability to handle and analyze Big Data sets across diverse disciplines</p>	<p><b>FY16- FY17 Complete</b> Establish a HU Research Computing (HURC) function to formalize collaborations; deliver common technologies that will make research computing easy and seamless to faculty; outline collective approach to recruiting, developing, and retaining highly skilled research computing staff</p>	
	Administration	<p><b>5. Student Information System</b> A unified student information system that delivers complete and accurate data, supports seamless enrollment and teaching across schools, and enhances academic planning and administration</p>	<p><b>FY14- FY17 Complete</b> Provide seamless enrollment to students and faculty across the University; simplify and improve access to secure, accurate student-related data</p>	
		<p><b>6. Common API</b> Administrative data across the University is accurate, timely, easy to understand and access.</p>	<p><b>FY17 and beyond Launched</b> Simplify our data exchange architecture Reduce cost; improve consistency; reduce operational burden; improve staff competency and productivity</p>	

Common Platforms	<p><b>7. Video</b> A cost-effective set of University-wide shared digital video services and resources, achieving economies of scale and ever-increasing integration across the entire lifecycle of digital video content production/management/consumption</p>	<p><b>FY15– FY17 Complete</b> Develop video retention policy; assess current available platforms and future viability; develop video service strategy with sustainable business model</p>	
	<p><b>8. Unified Communications: Harvard Phone</b> The availability for all faculty, staff and researchers across Harvard of a self-provisioned, easy to use, integrated set of communication tools and methods accessible from anywhere at any time and from any device.</p>	<p><b>FY15– beyond Launched</b> Reduce legacy infrastructure and lines; offer simple service packages/enhanced service set with neutral cost; empower users with self-service tools; simplify provisioning and billing models</p>	<p><b>Harvard Phone</b></p>
	<p><b>9. Collaboration Tools</b> Harvard students, faculty, and staff have access to an interoperable set of easy to use collaboration tools to communicate, share information &amp; collaborate on school or work related activities with each other and with external parties from anywhere at any time.</p>	<p><b>FY15– FY17 Complete</b> Reduce number of email and calendaring systems; support individual file sharing within and outside of Harvard; support group file sharing within/outside Harvard; help community effectively use tools</p>	
	<p><b>10. Cloud</b> Make it easy for the Harvard Community to realize the transformative benefits of the Cloud through enabling adoption and providing common services that are secure, cost-effective, and reliable.</p>	<p><b>FY15– FY18 Will complete by summer 2018</b> Reduce costs and price per compute by closing the expensive on-premises data center; create a coherent University cloud presence ; deliver new cloud-based services</p>	
	<p><b>11. Identity and Access Management</b> Users, application owners, and IT administrative staff have secure and easy access to computer resources across the University.</p>	<p><b>FY14– FY17 Complete</b> Simplify/improve access to applications and information; make it easier to research and collaborate within the University and with other institutions; improve Harvard’s security profile</p>	
Foundational Strategies	<p><b>12. Enterprise Architecture</b> A more coherent, flexible, cost effective University technology environment.</p>	<p><b>FY15– FY18 Will complete by summer 2018</b> Articulate principles/standards; organize reference artifacts and patterns; engage university to advance and support elements; cultivate a Community of Practice</p>	
	<p><b>13. Information Security</b> An ongoing information security operation that enables everyone at Harvard to be a good steward of the institution’s information.</p>	<p><b>FY14– FY16 Complete</b></p>	

<p><b>14. IT Business Continuity / Disaster Recovery</b>          Business continuity and disaster preparedness strategies across Harvard that ensure proper safekeeping of digital enterprise assets through strong, comprehensive, and where appropriate, shared data protection capabilities and IT disaster recovery plans at the University and school level.</p>	<p><b>FY17– FY18</b> Complete</p>	
<p><b>15. UX, Mobile, &amp; Accessibility</b>          Consumer-grade, easy to learn and use technology experiences that accommodate personal preferences and needs.</p>	<p><b>FY17– FY18</b> Will complete by summer 2018          Define IT support function that includes User Experience/Mobile/Accessibility strategies, standards and best practices; develop a User Experience/Mobile/Accessibility resource library and training; establish a User Experience/Mobile/Accessibility community of practice; create a facility to support tools and testing for Harvard community</p>	
<p><b>16. Vendor Management</b>          Establish a University-wide set of practices and policies that provides useful guidance and tools for the procurement and management of IT services and products.</p>	<p><b>FY16– FY18</b> Complete          Define university-wide, uniform best practices for IT to engage with the community to deliver complex IT solutions; adopt lifecycle approach to IT procurement and vendor management: vendor selection and contract negotiation, centralize on single contract management system (Novatus), ongoing vendor management and relationship management; establish a platform(s) for simple, efficient commodity IT procurement (HCOM or other)</p>	