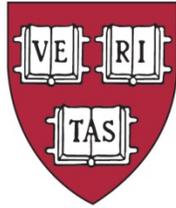


HARVARD UNIVERSITY



CIO Council Updated IT Strategic Plan

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“The art of progress is to preserve order amid change and to preserve change amid order.”

– Alfred North Whitehead

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 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.

Nearly three years into this original plan, it is clear that both rapid change and increasing reliance on technology require us to take a fresh look at the plan to ensure that Harvard’s IT strategy accurately reflects and responds to the community’s evolving needs. To that end, the CIO Council launched a working group in the fall of 2014 to review the plan and make necessary adjustments. In undertaking this task, the working group met weekly over the course of the fall semester to consider overall trends in higher education and technology, to identify Harvard priorities and organizational enablers and barriers that affect the way Harvard IT does its work, and to ensure that this new information was sufficiently integrated into the Strategic Plan.

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

Emerging Trends in Higher Education and Technology

Higher education has entered a period of disruptive change, driven in part by emerging technologies. Harvard President Drew Faust noted in her opening-of-year address in 2013: “As technology evolves and as familiar boundaries shift on the map of knowledge, educators are being pressured at every level to adapt in response. Technology is also giving rise to new educational models and to a whole new field of competitors who would seek to redefine what it means to ‘go to college.’”

Industry reports and current commentary emphatically echo these sentiments — Gartner, Forrester Research, and Educause describe foundational changes that are influencing the way people use technology and their implications for IT organizations and professionals in higher ed. These reforms are motivated not only by the growing consumerization of technology, but also by the recognition of new technical possibilities, from cloud computing to big-data analysis.

In reviewing this research, the working group identified the trends in higher education and technology that could have the most impact on our Strategic Plan. They include:

- **Increased experimentation in teaching and learning**
 - Faculty focus on student engagement and outcomes informed by data and learning analytics
 - Student expectations for personalized and interactive learning

- Expanded access through online and other delivery models
- Changes in the physical campus and learning spaces
- **New opportunities in research**
 - Big-data creation and analysis (data science)
 - Increasing interdisciplinary scholarship and research
- **Intensified financial pressures**
- **Expanded global competition and engagement**
- **Rapidly changing technologies in higher education**
 - Explosive growth in social, mobile, analytics, cloud, and video technologies
 - Growing expectations for open interfaces, open data, and interoperability
 - Proliferation of non-interoperable collaboration tools and systems
 - Increasing use of personal devices and direct access to third-party solutions
 - Increased security threats and privacy concerns

For university leaders, these trends signify profound changes to the higher-education model. Truly addressing them will require substantial changes to academic and administrative operating models.

For IT organizations and professionals, these trends represent a similar call for transformation. As one IT leader wrote: “Even though the ubiquity of technology ironically makes the work of the IT organization less visible, this work is more critical than ever today.” The future of American higher education depends, in many cases, on how well universities can effectively use technology to expand access, reduce costs, and advance research.

Harvard Context

As this “seismic shift” disrupts higher education, Harvard has not been immune to the forces of change. Over the past five years, the University has launched a number of initiatives and efforts to embrace this uncertain and impatient future. Examples include edX and HarvardX, the Harvard Initiative for Learning & Teaching (HILT), House Renewal, task forces on international strategy and global institutes, planning committees for big data, and the Harvard Campaign to support these ambitions.

Harvard Priorities

The working group reviewed major University activities, and the CIO Council as a whole consulted Provost Alan Garber, to develop a list of institutional priorities for the next three years that have implications for how we think about and deploy technology.

- **One Harvard:** Enabling the community to draw easily on Harvard’s widely distributed strengths
- **Teaching and learning:** Expanding access, advancing the science of learning, and enhancing education on campus and beyond
- **Research:** Advancing research through integrated knowledge and harnessing Harvard’s vast and diverse quantitative databases to drive toward real-world solutions
- **Globalization:** Striving for global reach and impact, while also integrating global perspectives into research and teaching

- **Campus enhancements:** Creating a campus for the next century (classroom spaces, House Renewal, the Allston campus and other new construction)
- **The Harvard Campaign:** Making significant progress toward the University’s \$6.5 billion capital campaign

Identifying and understanding University priorities is an important exercise; it helps us to rationalize and focus our work and gives us some confidence that we are moving toward the highest and best purpose of technology for the University.

Organizational Enablers and Barriers

Beyond external pressures and institutional goals, elements of Harvard’s structure deeply affect the way we carry out our work and our ability to implement technical solutions that can truly benefit the community. During the development of the original plan, the CIO Council felt it was important to note both the levers we could employ and the obstacles to address in implementing technology. Below is an updated version of those drivers.

Enablers	Barriers
<ul style="list-style-type: none"> • Increasing leadership recognition and commitment to the importance of technology across the University • A skilled and experienced staff of IT professionals • Collaboration within Harvard’s IT community and with external strategic partners • Pockets of innovation • Significant investments and expertise in research computing and online learning 	<ul style="list-style-type: none"> • A large user community with diverse needs, expectations, and technical skills • Locally supported, non-integrated applications • Harvard’s decentralized governance, planning, and funding processes • Unnecessarily complex infrastructure, systems, and processes • Expectations for ease of use and speed of deployment that drive users to purchase and deploy their own technology solutions • Increased competition for key IT skills

Updates to the IT Strategic Plan

Taking all of the above together, the CIO Council has made the following changes to Harvard’s IT Strategic Plan. We believe these changes will enhance the IT community’s understanding of its role and its goals, and provide guidelines for achieving those goals. Moreover, these updates account for the rapid changes in technology and seek to address the Harvard community’s evolving needs.

A Modified Vision for IT at Harvard

After careful analysis of emerging trends and institutional priorities, we crafted a vision to describe what all these data mean for technology at Harvard. Creating an engaging and inspiring vision is far from easy, but it is a necessary component of a good strategic planning process.

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 and to get the 1,400 IT professionals working across the University “rowing” in the same direction. Most important, the vision helped IT professionals understand the role they play at the University.

The working group focused on making its vision articulate, aspirational, and responsive to change. In considering modifications, we retained the focus on access, innovation, and collaboration, but attempted to describe our ideal future state in a more meaningful way.

Harvard 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

We also 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 Principles

For the updated plan, the working group has created guiding principles to help our teams better understand how we might achieve our vision. We felt the addition of guiding principles was an important augmentation to the original plan, serving as a crucial bridge from the vision to the initiatives and ensuring that they are connected in a rational way. The guiding principles are to:

- Drive toward **efficiencies** and cost savings.
- **Shift** more of our IT **resources** to support teaching, learning, and research.
- Identify opportunities for simplification to enable **agility** and enhance **ease of use**.
- Focus on **open architectures** and **open data** to enable flexibility, integration, and interoperability.
- Forge **strategic partnerships** and leverage resources beyond Harvard to accelerate our ability to deliver solutions.
- Adapt our role and skills to become **trusted partners** who empower and support Harvard’s students, faculty, and staff.

In addition to serving as a playbook for how we carry out our work, these guiding principles describe the essence of what we are striving to accomplish with our Strategic Plan.

Revisions to the Initiatives

Turning our attention to the actual work to be done, we reviewed our existing framework and the sixteen University-wide initiatives that we generated in 2012. Despite the rapid changes that have taken place over the past three years, we felt that the framework established in 2012 endured. It is described below.

- **Technologies** that support teaching, learning, research, and administration;
- **Common platforms** that are built at a University level and can be shared across schools; and
- **Foundational strategies** that define policies to guide IT work across the University.

Progress to date

Of the original 16 initiatives, ten have been launched: Teaching and Learning Technologies (1), Student Information System (5), Video (7), Unified Communication (8), Collaboration Tools (9), Identity and Access Management (11), Enterprise Architecture (12), Information Security (13), User Experience, Mobile, and Accessibility (15), and Vendor Management (16).

Modifications to enhance current initiatives

The revisions below represent adjustments to initiatives we feel are still relevant, but for which we have new information that necessitate a change in focus or goals.

- **Online Access to Harvard's Scholarship and Knowledge** (Formerly "Preservation and cataloging of digital assets"): Allowing easy and open global access to Harvard's research, scholarship, and knowledge.
- **Access to Institutional Data and Systems Integration** (Formerly "Access to Open Data" and "University Systems Integration"): Making sure administrative data across the University is accurate, timely, and easy to understand and access.
- **Enterprise Architecture** (Formerly "Technology Architecture"): Instituting a more coherent, flexible, and cost-effective technology environment University-wide.
- **Cloud** (Formerly "Access to computation and storage" and "Computing-on-Demand"): Creating a cloud-computing strategy and services that minimize risk, lower costs, and increase agility in the deployment of IT.
- **User Experience, Mobile, & Accessibility** (Formerly "Mobile Technology"): Establishing consumer grade, easy to learn and use technology experiences that accommodate personal preferences.

Additions to address critical needs

These new initiatives reflect how we plan to respond to emerging trends that were not as urgent or were not known when we developed the first Strategic Plan.

- **Data for Learning Analytics**: Ensuring 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.

- **Big Data for Research (Infrastructure and IT Organization):** Providing 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.
- **Business Continuity and Disaster Recovery:** Integrating 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 both University and school level.
- **Vendor Management:** Establishing a University-wide set of practices and policies that provides useful guidance and tools for the procurement and management of IT services and products.

Removals to reflect work taken up by others or no longer necessary

Finally, we propose the following deletions from the Strategic Plan. While we remain interested and involved in these areas, the work has either been taken up by other University organizations or does not require the attention of the CIO Council as a whole.

- edX
- Efficient and Secure Admin Systems

Please see below a **revised list of initiatives**, incorporating the changes noted above.

Technologies <i>Initiatives to support teaching & 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

Initiatives on deck

In the latter part of FY15, we launched User Experience (15) and Vendor Management (16) and have plans to launch IT Business Continuity / Disaster Recovery (14) before the end of the fiscal year.

The anticipated sequencing, duration, and financial implications of each initiative have been identified. In most instances active initiatives have been funded for their anticipated duration, but for the remaining six initiatives funding and resource pools will need to be identified before formal initiation via the CIO Council.

Please see below a breakdown of the **current financial estimates** of the initiatives.

		Financial Implications						External Spend
		Fy'14	Fy'15	Fy'16	Fy'17	Fy'18	Beyond	
Technologies	Teaching and Learning Technologies (TLT)	Funded						\$7.3M
	Data for Learning Analytics			Unfunded				\$3M
	Online Access to Harvard's Scholarship and Knowledge				Unfunded			\$5M
	Big Data for Research (Infrastructure & IT Organization)			Unfunded				\$10M
	Coordinated Student Information Systems	Funded						\$54M
	Access to Institutional Data and Systems Integration			Unfunded				\$4M
	Video		Funded					\$3M
Platforms	Unified Communications		Funded					\$12M
	Collaboration Tools		Funded		Unfunded			\$2M
	Cloud			Unfunded				\$3M
	Identity and Access Management	Funded						\$12.5M
	Enterprise Architecture		Funded					\$1.5M
Strategies	Information Security	Funded			Unfunded			\$0.3M
	IT Business Continuity / Disaster Recovery		Funded					\$0
	User Experience		Funded					\$0
	Vendor Management		Unfunded					\$0.4M

Next Steps

The University IT Strategic Plan, in coordination with supporting efforts to define a future IT Workforce Plan and an Integrated IT Funding Plan, will be actively distributed and promoted across the University to ensure 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 formal reviews of the plan every other year, with the next anticipated update to take place in late 2016.

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.