

Information Technology Strategic Plan

OFFICE OF THE UNIVERSITY OF ARIZONA CIO



UA IT Strategic Plan

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UA Information Technology Role and Vision

Information technology is a critical enabling factor for the UA to engage, innovate, and partner. There is no doubt that the reliance on technology in today's times has grown to a level of sheer dependency. It is embedded in everything we do here; the collection and analysis of research, how we communicate with each other, the running of our foundational operations such as payroll and building environmental systems, the conveyance of pedagogy to bright young minds and students, and how we stay connected to our colleagues around the nation and the world. The differentiation comes with our ability to leverage technology in ways that are cutting edge and very strategic.

It is imperative the UA stay on the leading edge of technological innovation as it becomes even more engrained in the core of our business. Through the efforts of the Mosaic initiative to replace our enterprise applications, we now have a new set of foundational technology tools to support the administrative business of the institution. In partnership with the CIO and Vice President for Research, the research community has a dedicated data center and high performance computing environment.

UA IT Strategic Plan

2013-2018

MISSION

The future of the research and academic university depends upon a robust technology ecosystem comprised of technical, economic, and intellectual assets, combined with values and policies that are designed to further collaboration, innovation and discovery.

- Find ways to leverage technology beyond our uses of today, in all facets of our mission
- Use technology to facilitate positive outcomes
- Eliminate as much redundancy as is possible and sensible
- Look for solutions, programs and partnerships that are cost effective
- Find ways of utilizing all University IT resources, including Arizona University System (AUS) resources, more efficiently and collaboratively.

VISION

Technology is intertwined in nearly every aspect of our lives today and is changing the world as we know it. In keeping an eye toward the future, it is important to understand how the IT landscape is changing and what new ideas are headed our way.

IT is a strategic asset with which we can transform, enable, and optimize vital aspects of our education, research and operations. This requires that we continue investing in the tools, the capabilities, and the talent to leverage technology in new ways.

PLANNING CLIMATE

Mobile, cloud, social, virtualization, digital content, big data—many of these "trends"—are quickly becoming part of the current generation of technology. Some of these trends are already an initiative on campus, others are in the research or development stage and some are merely ideas to be considered.

VALUES

- **Respect**
- **Integrity**
- **Transparency**

UA IT Strategic Plan

2013-2018

Information technology is a critical enabling factor for the UA in achieving its teaching, research, and public service mission. There is no doubt that the reliance on technology in today's times has grown to a level of sheer dependency. This institution, as with any educational institution, cannot complete its mission without technology. It is embedded in everything we do here; the collection and analysis of research, how we communicate with each other, the running of our foundational operations such as payroll and building environmental systems, the conveyance of pedagogy to bright young minds and students, and how we stay connected to our colleagues around the nation and the world. The differentiation comes with our ability to leverage technology in ways that are cutting edge and very strategic.

STRATEGIC PRIORITIES

- 1. Tools and Technologies for Instructional and Academic Success**
Define a roadmap to expand our capabilities and the use of the tools and technologies that will result in instructional and academic success.
- 2. Information Technology Infrastructure The Technological Transformation of Healthcare**
In partnership with UAHN, define and invest in an environment that is state-of-the-art, cutting-edge, and highly integrated
- 3. Big Data Environment for Researchers**
Define and invest in a state-of-art and integrated environment that supports, protects, leverages, and archives the expansive amount of data being generated out of every corner of our research, business and learning environments.
- 4. Information Technology Security**
Design and implement a comprehensive security program to protect sensitive information, reduce risk, and define roles and responsibilities.
- 5. Pervasive Access to Broadband**
Work with state and local leadership to promote the need for pervasive access to high-speed broadband services by all citizens

UA IT Strategic Plan

STRATEGIC PRIORITIES

- 6. Predictive Analysis**
Leverage and expand the University's new business intelligence environment to facilitate the increased need for more sophisticated information and predictive analytics.
- 7. Optimize IT Resource Management**
Identify specific actions to leverage our IT resources in ways that allow for greater buying power, facilitate a secure environment, minimize duplication of effort and investment, and create a more consistent level of support across the campus.
- 8. Globalization**
Ensure the technological tools and underlying infrastructure are in place to facilitate expansive interaction within the global community.
- 9. Faster, more integrated and pervasive Campus and National Network**
Define a plan for and invest in the expansion and upgrade of the University's communications infrastructure to support faster transmission of network traffic.

Student Learning and Success

Enable an unsurpassed, student-centered learning experience through IT.

.....
Engaging: E-1, E-2, E-3,
Innovating
Partnering: P-3
Synergy: S-5

STRATEGIES, ACTIONS, AND INITIATIVES

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Define a roadmap to expand our capabilities and the use of tools and technologies that will result in an unsurpassed, student-centered learning experience

- **Leverage course-related progress analytics**
 - D2L Insight, MapWorks
- **Enhance degree and course management capabilities**
 - Automated Grad process
 - Degree Audit workflow
- **Support for 100% engagement**
 - Engagement tracking
 - Student internship pipelines
- **Graduate students ready to engage in productive and satisfying work**
- **Provide a launch pad for student ideas**

Enhance ability to draw and retain a diverse student body

- **Support a global campus**
 - Integration with CESL, etc.
- **Improve financial aid and scholarship awarding capabilities**
- **Support enrollment programs and candidate tracking**

Consider and define a new model for the acquisition and dissemination of digital materials, textbooks and media

- **Provide a rich and collaborative eContent experience**

Create a richer, more integrated and personalized experience

- **Enhance the advisor-student experience**
 - Advisor Assignments
 - Academic Agreements

Information Technology Infrastructure

Enhance the university-wide information technology infrastructure and make it more accessible, dependable, secure, flexible, and scalable to meet the teaching, learning, research, and organizational needs of the University of Arizona and the community.

.....
Engaging: E-1, E-2, E-3, E-4

Innovating: I-1, I-3, I-6

Partnering: P-1, P-2, P-4

Synergy: S-1, S-3, S-4, S-5

STRATEGIES, ACTIONS, AND INITIATIVES

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Enhance Storage and Computing Infrastructure

- Consolidate on to an Enterprise Active Directory
- Establish a mobile solution to meet the needs to share and collaborate on documents with UA and non-UA affiliates
- Establish a program for backing up the data on end-user devices
- Establish a compute, storage, and network environment that is self-service, elastic, instantly provisioned, and pay-per-use
- Establish a data facility that meets the stringent compliance requirements of our most restrictive sponsors
- Develop an inventory of servers and services deployed on the UA network
- Consolidate on to a set of Enterprise Database environments (MSSQL, Oracle, MySQL)
- Define a consumer-based consumption environment/service
 - Establish a cloud services brokerage
 - Develop a cloud first sourcing model

Network Master Plan

- Improve the prevalence and ease of use of video collaboration technologies
- Complete WiFi installation
- Upgrade WiFi to AC
- Improve cellular coverage and penetration
- Improve network resiliency
- Complete MPLS implementation
- Extend the desk phone beyond the desk
- Integrated voicemail and email system
- Establish a high speed, low latency network dedicated to research
- Implement a Network Registration system
- Building, location, and application aware infrastructure

IT Optimization

- Leverage Commodity Pricing and Economies of Scale through Virtualization, Consolidation, 'In-A-Box' Services, and Cloud Services
- Increase virtualization
- Reduce the number of rooms housing physical servers
- Free up human capital capacity by reducing human capital required to manage servers

- Increase the use of standardized 'In a Box' services
- Structure, improve, and predict service delivery
- Increase the use of commodity cloud computing services as feasible
- Train and reappportion staff and processes through the federation process

Consolidate Campus-Wide Email, Calendaring, Directory, Content, and Collaboration structure

- Provide a single email and calendaring solution to all faculty, staff, and students
- Transition local email and calendars to the institutional solution
- Use a commodity provider for the institutional solution (may need to exclude export controlled mailboxes)
- Use the central calendaring solution
- Provide guest identities and attributes in the directory
- Provide central content management and collaboration solutions
- Implement and make available a pay-per-site SharePoint environment

Federate Customer Support on Campus to Capture Gains from Automation and to Maximize Employee Productivity

- Develop and pilot a service catalog to support federated customer support
- Implement institutionally shared issue tracking system with routing and local management
- Provide expedited service to executives and IT professionals
- Implement asset management, software distribution, patch management, and remote assistance solutions
- Improve speed of delivering new capabilities
- Implement a common help desk and IT support experience

Operational and Administrative Effectiveness

Maximize resources to promote financial and environmental sustainability, unsurpassed management of human and physical resources, and operational efficiency and effectiveness.

Engaging: E-1, E-2, E-3, E-4,
Innovating: I-2,
Partnering: P-2, P-4
Synergy: S-4, S-5

STRATEGIES, ACTIONS, AND INITIATIVES

Business/Education Intelligence Predictive Analytics

- Produce reports and analyses faster - create a more agile reporting and analyses environment
- Better support data driven decision making
- Expand current environment to support predictive analytics
- Expand/Grow expertise in sophisticated reporting, analytics, and interpretation of results.

Consumerization – BYOD

- Implement a mobile data management and protection suite
- Establish a BYOD policy that allows the integration and use of outside devices and apps
- Establish an adaptive support model that empowers and enables choice in device, application and access

Implement Mobile 3.0

- Provide a student lifecycle-centered UA mobile experience
 - New UA Mobile on smartphones and tablets
- Expand the reach of the UA brand
 - Refresh Arizona.edu
 - Expand Site-in-a-Box
- Provide a mobile device front end to our ERP portfolio
- Build an agile, strong and valued design and development capacity

Transform the institution's business with information technology

- Expand and leverage outcomes of UAccess systems
- Improve the customer experience
- Reduce administrative time
- Reduce unit costs per service
- Increase application and service availability
- Provide tools to increase corporate partnering and funding

Risk Management

Design and implement a comprehensive security program to protect sensitive information, reduce risk, and define roles and responsibilities.

.....
Engaging: E-1, E-3, E-4, E-5
Innovating: I-5, I-6,
Partnering: P-1, P-2, P-3
Synergy: S-4, S-5

STRATEGIES, ACTIONS, AND INITIATIVES

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Refine information security framework

- Enhance policies, governance structures, and metrics to increase effectiveness of Information Security program and foster accountability across the University

Improve incident response capability

- Decrease incident detect time

Increase situational awareness across campus

- Improve visibility into devices, services, and data across the University

Secure adequate staffing and funding

- Obtain funding to staff, train, and equip the Incident Response and Information Assurance functions so they can properly support the University's mission

Foster a Security Culture

- Enhance awareness and training programs to help all constituents incorporate good security practices into their daily routines

Academic Technologies

Continue to refine and develop instructional technologies and resources to provide instructors and students with a first class infrastructure for teaching and learning.

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Engaging: E-2, E-3
Innovating: I-3
Partnering: P-3, P-4
Synergy: S-4

STRATEGIES, ACTIONS, AND INITIATIVES

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Tools and Technologies for Instructional and Academic Success

- **Define a roadmap to expand our capabilities and the use of the tools and technologies that will result in instructional and academic success.**
 - Determine impact of Digital Textbooks on learning constructs and pedagogy.
 - Enhanced learning management toolkit
- **Update technologies in all the classrooms**
- **Provide synchronous and asynchronous learning capabilities**
- **Expand online courses and programs**

Provide an innovative learning environment

- **Develop innovative learning labs and classrooms**
- **Establish an Innovative Learning academy**

Research Computing

Advance and maintain national research prominence for Arizona University System with peer rankings of top American research universities.

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Engaging: E-3, E-4,
Innovating: I-1, I-2, I-3, I-4, I-5, I-6, I-8
Partnering: P-1, P-2, P-3
Synergy: S-3, S-4, S-5

STRATEGIES, ACTIONS, AND INITIATIVES

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Technological Transformation of Healthcare

- In partnership with UAHN, define and invest in an environment that is state-of-the-art, cutting-edge, and highly integrated
 - Develop and implement an environment/system whereby generic patient data, clinical data, and research data are integrated and accessible yet secure and reliable

Big Data Environment for Researchers

- Define and invest in a state-of-art and integrated environment that support, protect, leverage, and archive the expansive amount of data being generated out of every corner of our research and learning environments
- Provide a robust cyber infrastructure and data management environment particularly for research
- Expand existing high performance computing capacity to facilitate easier and more access by the research community

Research Computing Environment

- Double current HPC\HTC capacity
- Refresh and expand data visualization capabilities
- Establish an internship program that engages students in management the complexities of operating a world-class research computing environment
- Establish an offering that is easy to deploy and utilize that encompasses all of the components(compute, memory, storage, services) that typical researchers require
- Emulate the iPlant CyberInfrastructure for use outside of the iPlant grant

Information Technology Strategic Alliances

Establish mutually beneficial partnerships with the citizens and institutions of Arizona, the nation, and the world.

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Engaging: E-2, I-2,
Innovating
Partnering: P-1, P-4
Synergy: S-1, S-4, S-5

STRATEGIES, ACTIONS, AND INITIATIVES

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Enable faster, more integrated connectivity with National Networks through collaboration:

- Connect to and utilize the 100 Gb Advanced Layer 2 network service of Internet2
- Implement and utilize a Science DMZ to enhance research collaborations on the Internet2
- Implement Software Defined Network in the research network to enhance flexibility and ease of use

Actively engage in IT best practice sharing

- Participate in Tri-U, Higher Ed, and Quali Foundation efforts

Leverage service oriented partnerships for commodity services

- Focus on PeopleSoft, Quali, web and mobile, project management

Establish, maintain, and grow the Research and Education network for Arizona

- Make I2 connectivity available and leveraged by the K12 or Community College community
- Deliver course materials statewide by leveraging the network presence
- Enable Telemedicine and other collaborations to occur over high speed, low latency high definition video network

Appendices

A collection of supporting information and notes for the UA IT Strategic Plan.

APPENDIX A: BIG DATA

Process

1. The main strategic approach is to provide a set of common services where appropriate, and to leverage the existing strengths and opportunities in identified pillars of research:
 - a) Business
 - b) Earth Science
 - c) Space Science
 - d) Clinical Data/Genetics
2. Provided a letter of intent for each of the four pillars, identifying the nature of the opportunity, key contributors, and potential partners.
3. Managed timing around the start of school for all the researchers involved, so this planning was done in a very compressed time period.
4. Each participant was asked to communicate informally with their constituencies.
5. Informed Jennifer Barton and Joaquin Ruiz and briefed at a high level.
6. Scheduled a briefing with Skip Garcia later in the fall.

Team Members

The Big Data IT strategy was put together by a working group facilitated by Hank Childers (CIO) & Jeremy Frumkin (Library). Active team members included:

- Mike Bruck (HPC/HTC)
- Paulo Goes (MIS)
- Bonnie Hurwitz (Clinical Data/Genetics)
- Buell Jannuzi (Space Science)
- Nirav Merchant (Bio5/iPlant)
- Joellen Russell (Earth Science)
- Chris Schreiber (Information Security)

Process

1. Focused discussions were had with team members about how to more effectively support the colleges, especially Associate Deans, with predictive analytics.
2. Developed a concept of the virtual organization combining EIA and OIRPS, which was integrated into the planning, based on the meeting with Andrew Comrie.
3. Conducted and/or scheduled, a number of meetings with colleges (deans, associate deans, and/or department heads) to discuss the concept of the virtual organization, which is a key concept in the strategy.
4. Implementation of an executive series of dashboards and the creation of a concierge function have been highlights from conversations.
5. Once the ideas are refined, further communications will be implemented.

Team Members

The BI & Predictive Analytics IT strategy was effectively put together by a combination of two groups. One was the leadership of the EIA team, since much of the IT strategy is sourced in the strategic planning already done by the EIA leads. The other was a working group assembled for this purpose. The latter group was facilitated by Hank Childers (EIA), and included:

- Angela Baldasare (Student Affairs)
- Barry Brummund (CIO)
- Vincent Del Casino (SBS)
- Rick Kroc (OIRPS)
- Sudha Ram (MIS)
- Dimuthu Tilakaratne (EIA)

Process

1. The IT Optimization Team is composed of representatives from IT organizations across campus.
2. Proposed goals, tactics, and metrics that further optimized the deployment and use of technology on campus while maintaining a federated model to best meet the tailored needs of our faculty and staff.
3. Began with a series of high level topics for discussion. Building on the work of campus-wide IT initiative teams, we defined three goals as the foci for increased efficiencies:
 - a) Email, Calendaring, Directory, Content, and Collaboration
 - b) Virtualization, Consolidation, 'In-A-Box', and Cloud
 - c) Federated Customer Support
4. Provided a foundation on which quantitative and qualitative baselines can be established based on goals and their associated tactics. True optimizational gains can be accomplished, increasing the accessibility of services and normalizing the level of support across the institution.

Team Members

- Brian Atkinson (Co-Chair), Director, Technology and Facilities Planning, College of Social and Behavior Sciences; Chair, Dean's Information Technology Council
- Eric Jeanes (Co-Chair), Assistant Director, Technology Services, Residence Life; Chair, Administration Technology Advisory Council
- Barry Brummund, Deputy Chief Information Officer, Office of the Chief Information Officer
- Keith Wilburn, Assistant Dean, Information Technology Services, College of Medicine
- Derek Masseth, Senior Director, Client and Infrastructure Services, University Information Technology Services
- Bart Rossmann, Director, Instructional and Research Computing, College of Humanities
- Kathleen Bowles, Assistant Director, Infrastructure Development and Operations Center, University Information Technology Services
- Maysoon Eshelman, Assistant Director, Technology Solutions, Human Resources
- Leo Enfield, Principal IT Manager, College of Engineering

Process

1. Established the scope as the **enterprise application portfolio and services** (including the ERP systems, web sites, and mobile applications) and the **classroom technology program** (Frank).
2. Built a model that aligns the "Never Settle" strategic priorities with the anticipated needs of the Extended team (Frank).
3. Built a draft strategic plan by working with the IT Core team to capture initiatives, actions and projects in support of the model built in step 2 (Frank).
4. Shared the relevant areas of the draft strategic plan with each of the Extended team members (Frank + associated IT Core team leader).
5. Incorporated feedback from the Extended team into the strategic plan, including their metrics when available (Frank).
6. Aligned the strategic plan with the ABOR driven IT strategic plan categories (Frank).
7. Building a very detailed worksheet for capturing actions plans for the initiatives at the project level, including ballpark costs, benefits and dependencies (Frank + associated IT core team member).

Team Members

- Frank Feagans – Senior Director, Enterprise Applications Services
- IT Core team – Frank Feagans, Nikki Glazier Hodge, Gabe Quiroz, Mike Simpson
- Extended team – Gail Burd, Kasey Urquidez, Mark Mcgurk, Allison Vailancourt, Caroline Garcia, Lois Eisenstein

Process

1. Began work on the design and implementation of a comprehensive security program for UA to protect sensitive information, reduce risk, and define roles and responsibilities.
2. The University Information Security Officer convened a group of leaders from Human Resources, Risk Management, University Police Department and other administrative offices to gather input for a new information security strategy.
3. The University Information Security Officer has met with team members individually and will meet together as a group in October 2013.

Team Members

- Christian Schreiber, University Information Security Officer
- Michele Norin, University Chief Information Officer
- Allison Vaillancourt, VP, Human Resources
- Lois Eisenstein, AVP, Research Compliance & Policy
- Mark McGurk, AVP/Comptroller, Financial Services Office
- Steve Holland, AVP, Risk Management
- Beth Acree, University Registrar
- Anthony Daykin, Chief of Police, University Police Department
- Sara Click, Chief Auditor

Consumerization

Process

1. Developed a Consumerization Strategy from meetings with the core team, Derek Masseth and Robert MacArthur.
2. Many initiatives already under consideration in other strategic areas will contribute to an institutional Consumerization strategy. These elements consist of:
 - Cloud storage services
 - Common Help Desk, accommodating self-support and user owned equipment
 - Real-time collaboration
 - Telepresence
3. Focused consumerization on a support mentality rather than tangible action.
4. Action items specific to Consumerization, are policy and mobile data management\classification.

Team Members

- Derek Masseth, UITS, Senior Director Infrastructure Services
- Robert MacArthur, CALS, Program Director, Network/Data Programs
- Brian Atkinson, Technologies and Facilities Planning Director, College of Social and Behavioral Sciences
- Leo Enfield, Information Technology Manager, Principal, College of Engineering
- Eric Jeanes, Residence Life Assistant Director for Infrastructure Operations

Strategic Network Business Plan

Process

1. The University of Arizona (UA) engaged WTC Consulting, Inc. (WTC) to assist University Information Technology Services with updating the Strategic Network Business Plan (SNBP) from 2004.
2. Reviewed the overall networking direction, identified gaps between the current state and forecasted needs, updated capital and life-cycle cost estimates, created a comparison of alternatives, and selected of a strategy from which a roadmap will be developed.
3. Formed three teams to promote communication and engagement continuity. A Working Group provided financial and operational details. A Steering Committee provided guidance on various issues, and a Policy Group provided leadership and decision support.
4. The teams determined that each of the Configurations should contain the capital cost of installing the Cellular distributed antenna systems (DAS).
5. The models show a 10-year baseline requirement of \$151.8 million to continue with the current aging architecture.
6. Alternatives II - VIII have estimated costs of between \$163.6 and \$232.6 million. The Working and Steering groups selected a combination of Configuration Alternatives VI and VII, reflecting a more mobile future while investing in high performance wired networking for research and improved network resiliency.
7. The combined Configurations VI and VII would produce a 10-year cost of between \$176.7 and \$203.2 million.

Team Members

Dragana Vasic, UITs Assistant Director, Communications Infrastructure Development
David Lane, UITs Senior Information Technology Manager (Engineering)
Chris McCotter, UITs Information Technology Manager (Telecommunications Service Center)
Walt Moody, UITs Staff Engineer
Gabriel Lopez, UITs Director of Business Services and Finance
Ken Boynton, UITs Senior Communication Network Analyst
John Powers, Facilities Management Information Systems Manager
Bob Sommerfeld, UA Police Department Commander
Sharon Bushart, UITs Director of Information Technology Resources, Phoenix Campus
Paul Reeves, Information Technology Student Advisory Board (ITSAB) Representative
Robert MacArthur, College of Agriculture Program Director for Network / Data Programs

Gil Salazar, Information Security Office Senior Information Security Analyst
Pavel Jandura, Financial Services Office Director of Finance and Administration
Eric Jeanes, Residence Life, Assistant Director for Infrastructure Operations
Brian Atkinson, Technologies and Facilities Planning Director, College of Social and Behavioral Sciences
Tim Wunz, Information Technology Director, College of Pharmacy
Kathleen Bowles, Assistant Director, Operations Center UITs
Karen Egertson, Assistant Director, UITs Network and Classroom Field Operations
Matt George, Director of Video and Information Technology, Department of Athletics
Ryan Duitman, 2012 Strategic Network Business Plan Engagement Manager

Storage and Computing Strategy

Process

1. The Storage and Computing Strategy is a combination and consolidation of conversations that have occurred with campus and UITS constituents over the last year.
2. Many of those conversations were spurred from the IT Initiatives process, like Shared Storage, Catnet, Sharepoint, etc.
3. Other elements of the strategy are the result of ongoing activities in concert with customer departments, like email consolidation, private cloud, and cloud first sourcing model.
4. A majority of the work on the strategy was performed over email.

Team Members

- Derek Masseth, UITS, Senior Director Infrastructure Services
- Christian Schreiber, University Information Security Officer
- Gabriel Lopez, UITS Director of Business Services and Finance
- Brian Atkinson, Technologies and Facilities Planning Director, College of Social and Behavioral Sciences
- Leo Enfield, Information Technology Manager, Principal, College of Engineering
- Eric Jeanes, Residence Life Assistant Director for Infrastructure Operations
- Kathleen Bowles, Assistant Director, Operations Center UITS