**THE
UNIVERSITY
OF RHODE ISLAND**

THINK BIG **WE DO**

Information Technology (IT) Strategic Plan

2017-2021

FINAL APPROVED DRAFT

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Facilitated by:

BerryDunn

Prepared by:

**University of Rhode Island IT Strategic Governance Committee
(ITGov) with the Collective Input from the URI Community**

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Section 1 | The Strategic Context for URI's IT Plan

A Message from Provost Donald H. DeHayes

Information Technology (IT) is critical for all constituencies and functions of the University of Rhode Island (URI) community. It is ubiquitous in a way that would have been hard to envision even just a few years ago, and the rapidity of change will no doubt continue and hasten. It is within this context that the IT Strategic Plan outlines critical strategic goals developed and defined through a collaborative effort between IT and the URI community of faculty, staff, students, and administrators. As URI strives for increased innovation in a rapidly changing higher education landscape, IT must evolve, adapt and deliver on the action items identified in this plan. Indeed, our future will depend on our ability to be nimble, creative, and responsive to contemporary and emerging advances in technology in all aspects of our enterprise.

The newly formed IT Governance Committee (ITgov), working with consultants from BerryDunn, provided leadership for the development of this first ever URI Information Technology Strategic Plan. On behalf of the entire URI community, I thank ITgov and Information Technology Services for their tireless and and collaborative efforts in reaching out to and engaging with the URI community in developing this plan. As with our Academic Strategic Plan, this plan is intended as a "living" plan consisting of goals, strategies, and actions that will no doubt evolve over time. Nevertheless, the elements of this plan will guide our strategic directions and strategic IT investments and will enable us to remain innovative and responsive to emerging opportunities that will define our future.

Guiding the development of this IT Strategic Plan are these key values and comments from the Academic Strategic Plan:

President's Transformational Goals for the 21st Century
- Creating a 21st Century 24/7 Learning Environment
- Increasing the Magnitude, Prominence, and Impact of URI's Research, Scholarship, and Creative Work
- Internationalizing and Globalizing URI
- Building a Community at URI that Values Equity and Diversity

Change in Higher Education Will Impact URI
The following excerpt is from the Provost's letter to the URI community in the Academic Strategic Plan.

> "The landscape of higher education is changing rapidly and dramatically. Disruptive technologies, rising student debt, access and affordability, a renewed focus on student success and degree completion, globalization, and the evolving demography of our nation present challenges for every higher education institution in our nation. However, for those institutions committed to thoughtful

strategies and innovation, these challenges will be opportunities for advancement and success. URI must be one such institution.

Our future depends on our comprehensive commitment to thoughtfully and selectively embracing innovations with impact to shape a vibrant institutional future. We must define and invest in new modalities of student learning and educational technology, partnerships that support and enhance impactful scholarship, streamlined procedures and processes to allow agility, and advancement strategies that enhance our resource base and reputation. In so doing, we will become the first-choice institution for a dedicated and diverse community of students, staff, and faculty, and ensure a system of shared governance that will enable and empower URI in the future."

Donald H. DeHayes

Provost and Vice President for Academic Affairs

Section 2 | IT's Strategic Role at URI

URI engaged BerryDunn to conduct an independent assessment of the current IT organization, operations, and services, and to lead the University in developing a five-year IT Strategic Plan. BerryDunn's IT Assessment, issued in February 2016, offers observations and recommendations, and provided the baseline for the development of this IT Strategic Plan for URI[1].

How This Plan Will Positively Impact the URI Community

This plan will serve to guide the transformation of technology delivery and applications at URI over the next few years. It also will enable the University community to keep pace with change and to gain from opportunities for better communication and customer service, more streamlined operations, and new means of technology service delivery.

The IT Strategic Plan is designed to both co-exist and support the University's Academic Strategic Plan. Given the critical role of technology services at the University, the plan is purposely in place during the same period as the Academic Strategic Plan *Innovation with Impact – 2016 to 2021.*

All members of the URI community will benefit:

- **Students** will be equipped with up-to-date and program-appropriate technology. They will have access to learning spaces in a way that is flexible and makes efficient use of resources. Future apps will help to navigate to appropriate services and information to promote and advance their success.
- **Faculty** will benefit from more robust IT services that support course design and delivery and enhance learning opportunities in and outside of the classroom. Foster meaningful use of technology and applications for teaching, learning, and scholarship through greater access to relevant services.
- **Research Community** across all disciplines will have increased access to technology services and support for computer-intensive research and collaboration efforts. Data analytics, high-performance computing (HPC) capabilities and other research computing services will enhance our competitive position to compete for research funding while gaining broader recognition for the research accomplishments of our faculty, graduate and undergraduate students.
- **Staff** will benefit from opportunities to streamline essential business operations and work flow on the campus, enabling even greater focus on the URI mission and the University's Academic Strategic Plan. Increased training resources and capabilities will support the use of new tools and capabilities in service delivery across all URI services.
- **IT Staff** will work within a service-oriented culture that supports recruiting, retention, and development of excellent employees and provides people with the communications and the training they need to be successful. This will be true for both

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[1] http://web.uri.edu/itreview/files/BerryDunn-IT-Assessment-Final-Report.pdf

Information technology services (ITS) and non-ITS staff as they work more closely together to serve the URI community.

- **URI's Community.** As a public institution, URI plays an influential and impactful role across the state and beyond. The University is committed to delivering effective IT infrastructure and services that enables a diverse community to interact both locally and globally.

Next Steps and Acknowledgments

The roll out of this draft plan is intended to engage the URI community in the intentional and thoughtful process by which it was developed. We also take this opportunity to thank the plan's executive sponsors, the members of IT Strategic Governance Committee (ITGov), and the many individuals for their insight, perspective, and contributions throughout the planning process.

Section 3 | Six Goals of the IT Plan

This plan sets forth strategic direction for IT that will guide priorities, efforts, and investments related to IT over the coming years. The immediate focus of the plan is to align IT initiatives and engage the URI community to better support and realize the goals, strategies, and actions set forth in the Academic Strategic Plan (ASP):

1. Teaching and Learning:
   - *Enable and support innovative teaching and learning through advanced IT services.*

2. Research:
   - *Create and enhance IT services to support research, scholarship, and creative work.*

3. IT Infrastructure:
   - *Establish and create an agile, sustainable, and effective IT Infrastructure.*

4. IT Services:
   - *Advance the development, integration, and delivery of University-wide IT services to support effective management of physical, financial, and human resources.*

5. IT Risk Management:
   - *Design and implement a secure IT environment that reduces risk and ensures business continuity.*

6. IT Governance:
   - *Foster a collaborative and transparent planning, management, and communications protocol to effectively deliver and coordinate, and prioritize IT services.*

Sustaining the IT Plan

This plan also sets forth an approach, structure, and mechanism by which the process of technology planning is sustained so that priorities and decisions are made in alignment with the strategic direction of the University. Altogether, the plan identifies 14 strategies that will be undertaken in a logical and prioritized manner. An annual planning cycle for IT is introduced in Section 4.

Goal 1: Teaching and Learning

Teaching and Learning: *Enable and support innovative teaching and learning through advanced IT services.*

Preamble: URI must create a more connected campus community and leverage the innovative use of collaborative technologies with the creative energy of our faculty to advance new engaging and effective modes of learning and discovery. The University will benefit from greater engagement of ITS with faculty, staff, and students. This expanded engagement would focus on planning, implementation, and faculty and staff development in creative applications of technology to support innovative teaching, learning, and research needs.

Strategy 1: Establish a Culture of Collaboration and Leverage Existing Technology Investments to Advance Learning

Actions Needed to Implement

1.1.1 Engage faculty and students in the selection and application of new and innovative tools for collaboration, such as Google Apps for Education.

    1.1.1.2 Support and incentivize the use of these collaboration tools and assess outcomes.

1.1.2 Create a better-connected campus community and leverage technologies to strengthen internal and external communication.

1.1.3 Standardize one system for campus-wide communication regarding IT.

1.1.4 Expand ITS engagement with departments, committees, and initiatives supporting teaching and learning to help maximize and leverage existing technology investments supporting the University's academic core mission.

    1.1.4.1 Ensure appropriate ITS collaboration, engagement, and ongoing communications with any department, committee, or initiative supporting Teaching and Learning.

    1.1.4.2 Inform URI Community of any initiatives or IT tools supporting Teaching and Learning.

    1.1.4.3 Define the optimal organization structure and interface between ITS and the URI academic community to effectively support technology-based teaching and learning services.

1.1.5 Support the development and procurement, maintenance, and timely replacement of relevant technology in the classroom environment.

1.1.6 Select, implement and maintain student-required technology in the classroom with consideration for cost, feasibility and usability.

1.1.7 Support IT infrastructure and the needs of faculty for innovative teaching and learning strategies.

1.1.8 Maintain and support a scalable and sustainable Learning Management System (LMS) working with appropriate departments and committees to continually evaluate the performance and usability of the LMS while looking for opportunities for growth.

1.1.9 Create collaboration opportunities with faculty, staff and groups who may have subject matter expertise on particular pedagogical technologies or tools.

1.1.10 Develop a lifecycle maintenance plan for technology that supports teaching and learning to effectively plan for replacements and upgrades to technology.

Strategy 2: Provide and Promote Digital Literacy in Support of Teaching and Learning

Actions Needed to Implement

1.2.1 Provide technology-training services for URI faculty to demonstrate best pedagogical applications of specific software and hardware in relation to teaching and student learning.

    1.2.1.1 Inventory existing learning technologies deployed at URI today.

    1.2.1.2 Solicit faculty, students, and staff input on training needs, whether through ITS or through external providers, including online training delivery.

    1.2.1.3 Develop an institutional technology solution, in support of accessibility requirements and guidelines, to caption all classroom video materials, online or other medium.

    1.2.1.4 Provide options, both internally or outsourced, for adding closed captioning to faculty created video.

1.2.2 Engage faculty and academic leadership to determine IT priorities that support teaching and learning.

      1.2.2.1   Establish an agreed-upon planning cycle with ITGov, Faculty Senate/CITICCN, and Provost that represents an understanding of how technology can best support faculty teaching and scholarship.

1.2.3   Promote awareness of IT services targeted to faculty and student needs. Provide targeted faculty and student communication about technology in a timely manner.

      1.2.3.1   Create regular communications that highlight key services and provides ongoing training opportunities for community members.

1.2.4   Continue to develop a digital culture at URI beyond the classroom.

Goal 2: Research

Research: *Create and enhance IT services to support research, scholarship, and creative work.*

Preamble: Research-related infrastructure investments will be planned in support of an increasingly diverse computing capacity related to different types of data sets, applications, and devices. This effort will leverage work that has been done to date, including, but not limited to high performance (HPC) and research computing, described at: http://web.uri.edu/its/high-performance-and-research-computing/.

To ensure that the appropriate level of infrastructure, resources, and capacity is maintained, the University will establish a baseline of services in support of infrastructure to replace/upgrade core research systems.

Strategy 1: Managing Research Data and HPC

Actions Needed to Implement

2.1.1   Form an inter-disciplinary technology research group to support this initiative in coordination with the Faculty Senate Council for Research and Faculty Senate Committee on Information Technologies, Infrastructure, Computing. Communications, and Networking (CITICCN).

2.1.2   Identify a baseline recurring technology budget for research.

   2.1.2.1   Explore new ways of funding certain technology-based research investments (such as research overhead), focusing on funding approaches conducive to sharing resources across research disciplines, but with similar computing needs.

2.1.3   Establish mechanisms for improving communications and increasing awareness around research computing.

2.1.4   Expand HPC and research computing capacity and develop an operational business plan for the use and sharing of HPC computing and support.

2.1.5   Identify and map centralized IT services, hardware, and networks dedicated to HPC and research computing.

2.1.6   Develop data and asset classification for research activities, with clear definitions for protocols.

2.1.7   Consult with the Council of Deans and Vice President for Research to determine priorities that inform planning around research computing needs.

2.1.8   Develop a process with URI Purchasing and the Division of Research and Economic Development to track research computing investments.

2.1.9   Create data management and archiving functions for research.

2.1.10 Develop a centralized and secure system (a research information management system) to share, preserve, cite, explore, and analyze research data with input of researchers and Library faculty and staff.

2.1.11 Establish a maintenance plan (lifecycle) to replace/upgrade core computing systems that support research.

Goal 3: IT Infrastructure

IT Infrastructure: Establish and create a sustainable and effective IT infrastructure.

Preamble: URI needs a robust IT infrastructure with a funded replacement cycle that will enable this foundational infrastructure to support the mission of the University and allow it to continue on its path of innovative growth. Essential components include the design and engineering, procurement, implementation, and integration of existing successful architecture into system solutions.

As the infrastructure ages, URI should proactively consider and reassess new approaches to replacement planning, including potential opportunities to outsource aspects of the environment as alternative models continue to mature in the higher education market. Examples of alternative models include the increased presence of "cloud"-based services, such as infrastructure-as-a-service, software-as-a-service, and platform-as-a-service.

Strategy 1: Technology Lifecycle Management

Actions Needed to Implement

3.1.1   Create a detailed inventory of IT infrastructure.

3.1.2   Establish a Network Advisory working group, which will enable continuous improvement through feedback and evaluation. (Dissemination of communications, wireless functional needs, logical topology issues, etc.)
      3.1.2.1   Evaluate the creation of a Network Operations Center with Information Security incident response capabilities.
      3.1.2.2   Confirm the process for updating and assessing network inventory.

3.1.3   Develop training around inventory procedures and delegating ownership of inventory for each department.

3.1.4   Develop an IT Infrastructure Service Catalog in conjunction with the IT Service Goal in this Plan, which will help identify available Infrastructure services, responsible parties and contacts.

3.1.5   Develop a coordinated approach to reviewing campus-wide hardware purchases with IT resources to ensure that maintenance will be available throughout lifecycle.

3.1.6   Develop a University-wide IP addressing system upgrade (such as IPv6) to accommodate additional "Internet of Things" technology and scalability.

3.1.7   Develop a Technical Reference Model (TRM) that serves the entire campus to streamline planning and procurement for technical purchases by establishing specifications and standards that align with security and purchasing requirements.
      3.1.7.1 Develop a TRM for provisioning services to the campus community, e.g. virtual server allocation, cloud services.

Strategy 2: Optimize Enterprise Software Systems

NOTE: The term "Enterprise Software Systems" in this context refers to any Information Technology system provided at URI that serves the entire campus community or multiple colleges and departments, including all academic, research and administrative.

Actions Needed to Implement

3.2.1   Assist functional stakeholders with improving access to information and strengthening reporting capabilities and analytics.

3.2.2   Establish clear data and application ownership for all enterprise systems, including Google Apps for Education and Academic applications.
   3.2.2.1 Meet with data and application owners to identify and discuss opportunities for integration and/or consolidation of systems and design improvements.
   3.2.2.2 Look to data and application owners for collaborative leadership in establishing direction and improvement of enterprise services, including Academic and Google Apps for Education.

3.2.3   Inventory enterprise systems, including feeder and shadow systems to help define the full enterprise architecture of software applications licensed at URI.

3.2.4   Identify "best practices" for PeopleSoft/Oracle (e-Campus) modules; review other higher education implementations to gain lessons learned and leverage new functionality not being utilized today at URI.

3.2.5   Identify "best practices" for enterprise academic systems, such as (but not limited to) Learning Management Systems and Google Apps for Education; review other higher education implementations to gain lessons learned and leverage new functionality not being utilized today at URI.

3.2.6   Map PeopleSoft customizations with respect to fit, usefulness, and consolidation opportunities. Use this information to reduce and consolidate URI-specific customizations or replace customizations with vendor-provided features.

3.2.7   Perform a fit/gap analysis on current URI PeopleSoft/Oracle (e-Campus) features, functionality and those additionally available from PeopleSoft/Oracle, to determine opportunities for improvement and streamline business processes, as well as to implement reduction of customizations to vendor-delivered software.

3.2.8   Provide online learning and training opportunities to the URI community on e-Campus and Google Apps for Education functionality and improve documentation and access.
   3.2.8.1   Develop a central repository of instructional materials for common tasks and ensure that it is maintained and updated.

3.2.9   Develop a repeatable process for periodically reviewing systems and identifying systems to be retired or upgraded.

3.2.10   Identify and document data and application owners for systems represented in the Enterprise Architecture Model (see Goal 5: IT Risk Management, Strategy 4: Strengthen Data Quality to Increase Analytics).

3.2.11   Develop a formalized and consistent process for evaluating current and future information systems in the context of the existing environment, with a full understanding of resource options, Total Cost of Ownership, and University goals and needs, both at the department and University level.

3.2.12   Select new systems consistent with selected IT Service Methodology and best practices, which is inclusive of all impacted parties and considers an understanding of how those systems will fit into the overall enterprise ecosystem and plan for Total Cost of Ownership: acquisition, implementation, and maintenance.

3.2.13   Create an enterprise architecture model that depicts the University's systems, including those systems managed by ITS and those systems managed by other non-ITS (vendor and distributed URI IT). Use the enterprise architecture model to inform University IT decision-making, highlight gaps and integration needs, provide data, and support consolidation of redundant functions across systems.

Goal 4: IT Services

> **IT Services:** Advance the development, integration, and delivery of University-wide IT services to support effective management of physical, financial, and human resources.

Preamble: URI will focus on IT services that reduce administrative and back office IT support needs, allowing the University to repurpose IT resources to support the URI Mission and Academic Strategic Plan. The IT service delivery model will provide a framework for managing the needs, priorities, and resources shift.

Strategy 1: Adopt Best Practices to Strengthen IT Service Delivery

Actions Needed to Implement

4.1.1   As a priority item and continuation of the Strategic Planning effort, identify and define the URI community of IT service providers: who, what, and where. Include this group throughout development and implementation of a Service Delivery strategy.

4.1.2   Develop training requirements for IT staff focused on delivery of services and skills required for current and future IT needs at the University.
4.1.2.1 To support this action, management of all IT staff should develop an annual (or semi- annual) training plan for each staff member, including IT leadership, which meets the goals of delivering proficient, skillful services for their organizational unit.

4.1.3   Adopt a proven IT service methodology that fits the needs of the URI community.

4.1.4   Develop a process to ensure IT services meet current and known future regulatory needs, such as Accessibility requirements.

4.1.5   Define IT services and service owners (both ITS and external to ITS) that result in a University-wide IT Service Catalog.

4.1.5.1   Engage stakeholder participation (internal and external to ITS).

4.1.5.2   The IT Service Catalog must be customer-centric and improve visibility of IT services across the University. The IT Service Catalog has a critical role in improving communication and awareness for IT services at URI by not just identify what services are available, but also where the University's "Pockets of Excellence" are for those services.

4.1.5.3   Regularly assess the contents of the catalog, eliminate items not needed or used, and add items that are requested by users.

4.1.5.4 Create, document and publish Service Catalog to the ITS website.

4.1.5.5 Establish a process to update the IT Service Catalog.

4.1.6 Define and implement an IT service delivery model, consistent with the service methodology adopted, which organizes the various elements involved in establishing and maintaining an effective portfolio of IT services. The IT service delivery model provides the framework for managing the elements of the IT service catalog as needs, priorities, and resources shift.

4.1.7 Re-brand and market the URI Help Desk as the *IT Service Desk*, which will become owner and manager of the IT service catalog.

4.1.7.1 Establish a core set of updated values, goals and purpose for the newly branded IT Service Desk, consistent with the adopted IT Service Methodology.

4.1.7.2 Train central and distributed IT staff about the Service Desk and the results of 4.1.5.1, including how their actions impact customer service.

4.1.7.3 Implement a new ticketing system that drives communication and incorporates both IT central and IT distributed inputs and outputs to continuously improve customer service.

4.1.7.4 Communicate and promote service functions of the IT Service Desk to faculty, staff, and students.

4.1.7.5 Create a qualification process that would enable distributed IT support to have enhanced capabilities, like the ability to reset passwords (see Identity Management).

4.1.7.6 Create a process that would regularly examine ticketing data to identify changes in IT services that can be made to lower requests for assistance and improve response times.

4.1.7.7 Create a dashboard that would provide instant visibility of system status to the user community.

4.1.8 Establish University-wide metrics of service levels.

4.1.9 Define and formalize Service Level Agreements (SLAs) and a common SLA template in conjunction with the IT Service Catalog.

4.1.10 Define and formalize an escalation and priority system for service requests.

4.1.11 Establish and maintain an IT service delivery model that proactively allocates resources and priorities based on the needs of the University's Academic Strategic Plan and any strategic University initiatives.

Strategy 2: Coordinate IT Providers to Deliver Services to the URI Community

Actions Needed to Implement

4.2.1 Reorganize the ITS organizational structure to reflect the new model and the emphasis on service delivery.

    4.2.1.1 Promote agility and flexibility in the IT workforce with the goal of being more adaptive to IT's ever changing demands, URI must establish mechanisms to periodically review IT positions and update job descriptions.

4.2.2 Using the IT Service Catalog as a starting point, identify and coordinate hybrid IT services (provided by both ITS and non-ITS) from a functional perspective (not an organizational perspective).

4.2.3 Conduct a pilot effort with one or two IT services identified as "hybrid."

    4.2.3.1 Determine and implement organizational changes (i.e., implementing dotted reporting lines with a coordinating entity).

    4.2.3.2 Establish a communication mechanism for units involved in providing each hybrid service.

    4.2.3.3 Expand efforts to include other hybrid IT services identified in step one, applying lessons learned during the pilot effort.

4.2.4 Develop cross-functional communications structures for IT service providers.

    4.2.4.1 Create technical affinity groups across central and distributed IT.

4.2.5 Inventory and catalog a portfolio of IT staff skills, i.e., Staff Expertise Database.

4.2.6 Ensure the workforce is reflective of URI diversity and inclusion goals.

4.2.7 Increase IT coordination and consistency between central and distributed IT service providers:

    4.2.7.1 Document responsibilities and roles for all IT positions

    4.2.7.2 Require departments and Colleges to coordinate all IT hiring with ITS before it occurs

4.2.7.3 Update all non-classified IT job descriptions with meaningful and up-to-date job titles, skills, roles and responsibilities - used in the marketplace today.

4.2.7.4 Inform URI leaders why this change will benefit all URI stakeholders.

4.2.8 Adopt a hybrid University-wide IT organizational model that formally recognizes the entire IT community that exists across the University.

4.2.8.1 Coordinate all IT resources to better serve URI. All IT personnel (ITS and non-ITS) should have coordination with ITS as the central IT service provider at URI.

4.2.8.2 Reduce the complexity and replication of IT services. This will help improve communications and transparency, which will enable URI to deliver more efficient IT services to the academic, research, and administrative sectors of the university.

Goal 5: IT Risk Management

IT Risk Management: Design and implement a secure IT environment that reduces risk and ensures business continuity.

Preamble: URI will implement a risk-based information security program with the goal of aligning cyber activity with University strategy. The program provides standard measurement that organizations can use to measure risk and improve security. The core of the program will consist of five components:

- Identify
    - o Asset Management, Business Environments, Governance, Risk Assessment, Risk Management Strategy
- Protect
    - o Access Control, Awareness and Training, Data Security, Information Protection, Maintenance, Protective Technology
- Detect
    - o Anomalies and Events, Continuous Monitoring, Detection Processes
- Respond
    - o Response Planning, Communications, Analysis, Mitigation, Improvements
- Recover
    - o Recovery Planning, Improvements, Communications

Strategy 1: Expand Information Security Education and Awareness

Actions Needed to Implement

5.1.1 Establish and communicate this effort as a University-wide initiative, including senior leadership support and understanding of cyber risks.

5.1.2 Develop, prioritize, and implement training with requirements for participation across the URI community.

5.1.3 Develop and implement an Information Security Training Program with requirements for participation across the URI community.

    5.1.3.1 Establish a process for determining annual training content for both end users and the IT community. As part of the process, consider input from IT security risk assessment efforts, help desk tickets, security incidents, Office of the Chief Information Security Officer, IT directors from across the campus, and in conjunction with ITGov.

    5.1.3.2 Develop and get approval for training.

5.1.3.3 Identify what end user and IT practitioners will need for different training.

5.1.3.4 Implement training program.

5.1.3.5 Define metrics for pre- and post-training.

5.1.3.6 Establish mechanisms for tracking and reporting on training completion.

5.1.3.7 Conduct annual assessment of training program to identify areas for improvement.

5.1.4 Leverage Communications and Marketing for developing an IT Security Communications Plan.

5.1.5 Develop and implement Information Security Knowledgebase.

5.1.5.1 Determine how the Knowledgebase will be delivered (i.e., where will the Knowledgebase exist and how will people find it). Consider this effort in conjunction with changes to the IT Service Desk and an IT Service Catalog.

5.1.5.2 Establish a process for maintaining the Knowledgebase, engaging content owners.

5.1.5.3 Establish a plan for promoting awareness and use of the Knowledgebase.

5.1.5.4 Conduct annual assessment of Knowledgebase to identify areas for improvement.

5.1.6 Implement a comprehensive program that emphasizes awareness and training for the entire campus community. Security awareness training will be part of URI's Information Security Program.

5.1.7 Include training for both end users and IT service providers.

5.1.8 Revisit the scope of the training program annually. It should be informed by information security assessment efforts, security incident trends, input from the Information Security Office, input from IT directors across URI, and help desk ticket data.

Strategy 2: Develop and Sustain a Robust Information Security Program

Actions Needed to Implement

5.2.1   Establish and communicate the Information Security Program as a University-wide initiative. Emphasize the importance of following good security practices to all faculty, students, researchers and staff.

5.2.2   Establish ITS Security as also an Information Security Audit group, in accordance with current IT Security standards, inclusive of institution-wide digital and physical information.

5.2.3   Develop security solutions that cut across organizational boundaries, providing departments the opportunity to identify security threats and vulnerabilities. Focus on protecting infrastructure, end points, and URI data (physical and digital) with multiple layers of highly integrated protection.

5.2.4   Conduct a Current Risk Profile, as well as ongoing risk assessments.

5.2.5   Create a Target Risk Profile to guide development of a risk-informed security profile.

5.2.5.1   Determine, analyze, and prioritize security gaps to allow departments to improve their current risk state.

5.2.5.2   Develop a Security Action Plan (Roadmap) to the Target Risk State.

5.2.6   Align the security program with the development of URI's Technical Reference Model (TRM – see Goal 3).

5.2.7   Create a centralized location for security policies, frequently asked questions, and alerts or announcements.

5.2.8   Provide users with a single resource (website and human resource) for researching questions related to information security policies and practices as part of the new IT Service Desk.

Strategy 3: Establish Identity Access Management (IDM) Lifecycle

Actions Needed to Implement

5.3.1   Identify and catalog systems that users at URI need to gain access or to confirm identity, e.g., PeopleSoft, Sakai, Google, computer labs, wi-fi access, door swipes, document signatures, etc.

5.3.2   Create a system to identify user types, roles, and authorizations (Access) and allow grouping and delegation.

5.3.3   Evaluate Identity Management systems and compare to currently used systems.

5.3.4   Research and evaluate what other peer universities use for Single Sign-on (SSO) systems.

5.3.5   Implement a Federated Identity, SSO, Identity Management System, and/or portal system at URI.

5.3.6   Create a plan and a system to archive, purge, and notify inactive identities and accounts across all URI systems.

5.3.7   Extend self-service password changes.

5.3.8   Establish and publish a standard for managing identities and access.

5.3.9   Create a maintenance plan for identification and access.

Strategy 4: Strengthen Data Quality to Increase Analytics

Actions Needed to Implement

5.4.1 Establish a data governance structure that results in improved data quality and usability to inform University decision making and recognizes the value of data as an institutional asset.

    5.4.1.1 Establish a cross-functional project team to work with University leadership, ITS and ITGov to develop and implement data governance.

    5.4.1.2 Create a data governance model that sets forth clear roles and responsibilities and is supported by executive leadership.

5.4.2 Create a Unified Data Dictionary for all databases. Priority should be first all Enterprise-wide systems and data stores such as, but not limited to: e-Campus Financial, HR, Budget, Student Administration, as well as Alumni systems and Learning Management Systems.

5.4.3 URI will need to assign roles and responsibilities that consider the following duties:

    5.4.3.1 **Data owner** establishes policies and owns data quality for one or more master data domains, such as customer data, product data, portfolio data, location data, etc.

    5.4.3.2 **Data steward** implements and enforces policies and business rules, and corrects data quality problems, including matching records, replacing bad data with good data, and making "survivorship" decisions if more than one record for the same person exists.

    5.4.3.3 **Data architect** evaluates and modifies system components to alleviate data quality problems.

    5.4.3.4 **Data modeler** captures and documents business rules that determine data quality.

    5.4.3.5 **Data analysts** discover and research problems for the data owner(s) and investigate data quality on a record-by-record, value-by-value basis to look for exceptions, duplicates, etc.

5.4.4 Identify enterprise systems and sources of data, including sources of data and data feeds into and out of all enterprise systems.

5.4.5 Identify data ownership responsibilities, including processes to maintain data and share data among systems and people (see 5.4.3).

5.4.6 Leverage data governance to establish improved reporting capabilities, streamline business processes, and gain value from data analytics.

5.4.7 Consider the following elements in developing a data management program to strengthen data quality at URI:

> 5.4.7.1 **Data policy** – Have a shared understanding for how data is to be used at the University. This understanding will be supported by clearly defined data security classification policies stating which systems are the "system of record" for different data types. These policies should be University-wide.
>
> 5.4.7.2 **Data standards** – Have a common terminology for data elements.
>
> 5.4.7.3 **Business processes** – Move from segmented/"siloes" to integrated business processes and implement strategies for integrating data from disparate systems of record.
>
> 5.4.7.4 **Enabling technologies** – Support a common set of tools to manage and distribute data across the institution. In conjunction with a data dictionary, business analytics and other tools to enable data-driven decision making.
>
> 5.4.7.5 **Risk management and compliance** – Gradually move towards a model where data quality controls are fully automated and integrated, and data classification policies are incorporated into the University's risk management practices.

5.4.8 Improve data quality, using PeopleSoft (e-Campus) as the system of record to position the University to establish a data analytics strategy, where ITS works collaboratively with stakeholders to develop analytics models that focus on those factors that are most important to URI.

Strategy 5: Develop and Implement an IT Business Continuity Plan

Actions Needed to Implement

5.5.1 Create a cross-functional, collaborative project team focused on creating a set of processes, tools, roles, and responsibilities in the event of a disaster, so that the University can continue critical operations on its way to full recovery.

5.5.2 Inventory critical operations required to maintain minimal business operations.

5.5.3 Identify steps, processes, and tasks required to bring critical operations online and serving the URI community, as well as the conditions to implement such a plan.

5.5.4   Identify owners of each process and the overall Business Continuity Plan.

5.5.5   Identify processes to document, rehearse, maintain, and prepare to implement the Plan.

5.5.6   Identify tools, vendor contracts, and changes to existing hardware, software, and operational equipment (design, engineering, hosting, physical location, etc.) in order to support a Business Continuity Plan.

5.5.7   Create a periodic update schedule to the Plan.

5.5.8   Provide a structure and guidance to departments to create their own Continuity Plan for local and unique services.

Goal 6: IT Governance

> **IT Governance:** Foster collaborative planning, management, and communications to effectively deliver and coordinate IT services.

Preamble: URI should establish a University-wide planning model inclusive of ITS, distributed IT, and the needs of the URI community. This initiative extends to the entire IT community, which consists of central (ITS) and distributed IT services. In order to operate in a way that is coordinated, collaborative, and effective, a functional governance structure is imperative. Informing the URI community about technology initiatives and projects will help the IT community gain credibility and open additional opportunities for effective service delivery.

Strategy 1: Develop a Comprehensive IT Communications Model

Actions Needed to Implement

6.1.1   Create a Communication Model that provides standards for keeping the URI Community informed, provides information sharing, and works with the URI community to ensure communications is a two-way, collaborative process with shared responsibilities.

    6.1.1.1   Develop a Communication Model with input from faculty, staff, and students. Gathering input from various stakeholder groups that is representative of target audiences will enable URI to establish a program that demonstrates understanding of user needs.

    6.1.1.2   Increase transparency to foster trust, accountability, knowledge sharing and collaboration across University IT providers and customers.

    6.1.1.3   Collect information on progress made in addressing plan initiatives and reporting out to the University community.

    6.1.1.4   For both central and distributed IT, present IT priorities and objectives with a URI IT community voice.

    6.1.1.5   Define a multi-faceted communications strategy that considers web presence, newsletters, push notifications, project portfolios, training, status reports, demonstrations, IT Tech Fair, and inter-IT communication.

6.1.2   Develop communications protocols with a focus on consistent messaging that people can recognize and understand.

    6.1.2.1   Create templates for a common format to communications.

6.1.2.2 Identify target audiences and the appropriate messaging tools for each group.

6.1.2.3 Identify triggers and protocols for delivering particular communications to each target audiences.

6.1.2.4 Provide updates that are timely and succinct.

6.1.3 Determine if a self-service portal for choosing how communications are received can be developed to provide flexibility to end users while not allowing them to opt out of critical messaging.

6.1.4 Create a critical systems status page for enterprise software (for example, PeopleSoft, Sakai, Google, etc.).

6.1.4.1 Provide information at a high level, but give users additional drill down capabilities.

6.1.5 Establish a University-wide communications model inclusive of ITS, distributed IT, and the University at large. This initiative extends to the entire IT community, which consists of central (ITS) and distributed IT services.

6.1.6 Inform the URI community about successful technology initiatives and projects to help the IT community gain credibility and open additional opportunities for effective service delivery.

6.1.7 Work with URI Communications & Marketing and the Web Policy Council to continually improve the University's web presence, including user experience, user interface and compliance.

Strategy 2: Ensure Effective IT Governance

6.2.1 Consider and reassess new approaches to replacement planning, including potential opportunities to outsource aspects of the environment as alternative models continue to mature in the higher education market.

6.2.2 Maintain and incorporate the enterprise architecture model into ongoing planning as part of the IT governance function.

6.2.3 Implement a planning cycle based on the approach outlined in Section 4.

6.2.4 Continue to support and expand the functions of IT Governance through the IT Strategic Governance Committee (ITGov). Assign stewardship and assessment of the IT Strategic Plan to ITGov, in collaboration with the institution's Chief Information Officer.

Summary Matrix of Goals and Strategies

This section summarizes the initiatives defined in Section 3 and provides an overview of how each one links to the ASP.

Goal	Academic Strategic Plan Goals Linkage
1) Teaching and Learning: Enable and support innovative teaching and learning through advanced IT services.	Broad impact on goals. Including, but not limited to: Goal 1 – Enhance Student Success Goal 2 – Expand Research, Scholarship, and Creative Work Goal 3 – Grow a Global Presence
2) Research: Identify and support technology services that facilitate and provide tools for expanding research, scholarship, and creative work.	Broad impact on goals. Including, but not limited to: Goal 2 – Expand Research, Scholarship, and Creative Work Goal 5 – Streamline Processes to Improve Effectiveness
3) IT Infrastructure: Establish and create a sustainable and effective IT infrastructure.	Goal 1 – Enhance Student Success, specifically Strategy 4 In general, strengthening information security will benefit all ASP goals.
	Broad impact on all goals, with an emphasis on Goal 5 – Streamline Processes to Improve Effectiveness, in particular Strategies 1 – 5
4) IT Services: Advance the development, integration, and delivery of University-wide IT services to support effective management of physical, financial, and human resources.	Goal 1: Enhance Student Success. Strategies 1 – 3 Goal 3: Grow a Global Presence. Strategy 5 Goal 5: Streamline Processes to Improve Effectiveness. Strategies 1 – 6
	Broad impact on goals. Including, but not limited to: Goal 1 – Enhance Student Success Goal 2 – Expand Research, Scholarship, and Creative Work Goal 3 – Grow a Global Presence Goal 4 – Embrace Diversity and Social Justice Goal 5 – Streamline Processes to Improve Effectiveness, in particular Strategy 1 – 2

5) IT Risk Management: Design and implement a secure IT environment that reduces risk and ensures business continuity.	Broad impact on goals. Including, but not limited to: Goal 1 – Enhance Student Success, in particular Strategy 3 Goal 2 – Expand Research, Scholarship, and Creative Work, in particular Strategy 1 and 5 Goal 3 – Grow a Global Presence Goal 4 – Embrace Diversity and Social Justice, particularly Strategy 1 Goal 5 – Streamline Processes to Improve Effectiveness, in particular Strategy 2 – 3
6) IT Governance: Foster collaborative planning, management, and communications to effectively deliver and coordinate IT services.	Strengthening IT communications and coordination of IT resources across the URI community will benefit all ASP goals to foster student success, support research, and project a global presence for URI.

Section 4 | Implementing and Sustaining an IT Plan

The following exhibit depicts how the different elements of the IT plan will work together to support the IT community and the services delivered to students, faculty, staff, and leadership.
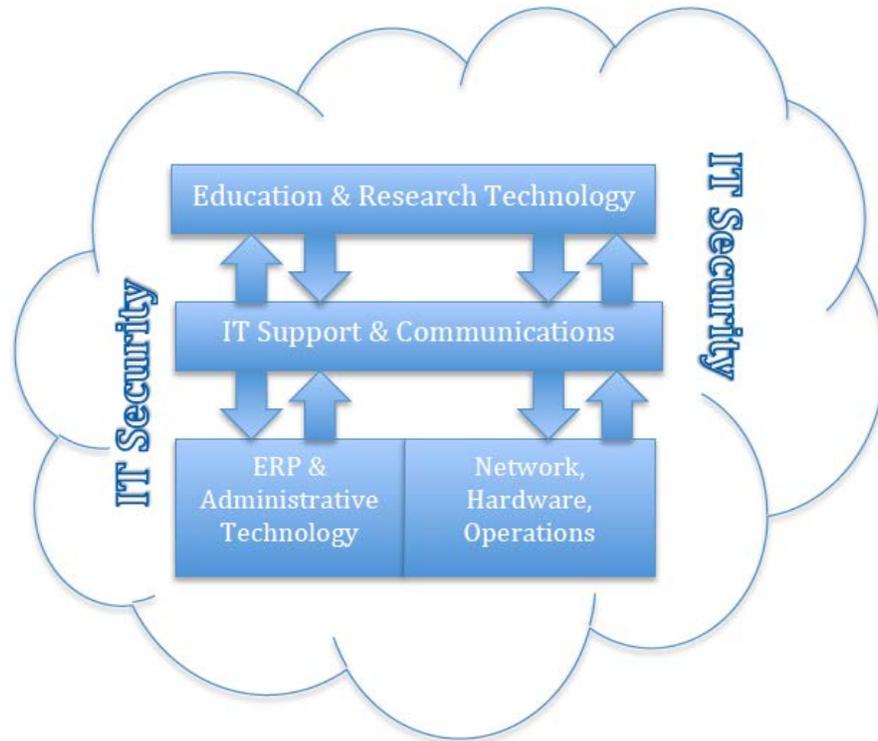
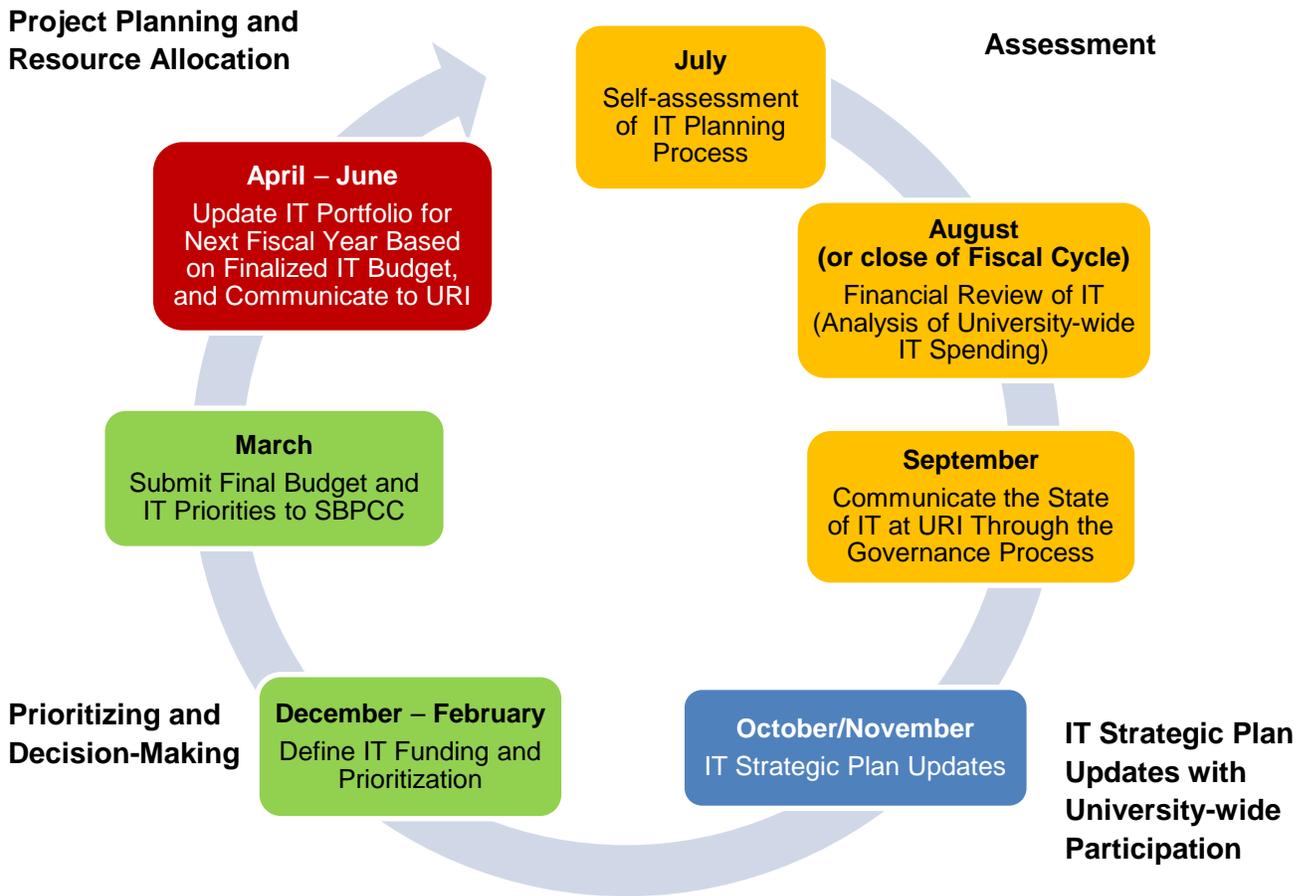A plan of this magnitude necessitates the following:

- Continued active sponsorship and support from senior academic and administrative leaders will be critical to the successful adoption of the goals, strategies, and actions outlined.

- As initiatives are implemented, project goals and objectives must be clearly communicated to stakeholders and progress proactively monitored and communicated.

- Many changes outlined in the plan are non-technical; for example, changes may entail cultural shifts, process changes facilitated by new initiatives, policy and guideline adjustments, or financial and/or budgetary modifications.

- Some additional or redirected technology resources will be required to manage new systems or new technologies and to properly react to changing business needs.

- Faculty, students, staff, and administrators, and staff need to work cooperatively and collaboratively to facilitate effective change in the best interest of the University.

- Training and technical support staff will be critical to the success of the Plan's implementation. University constituents must be ready, willing, and able to expand skills to effectively use new technology and embrace change.

- The University's strategic planning process includes specific consideration of how technology supports the mission of the University. It is important for URI to maintain an appropriate framework to evaluate, assess, and communicate emerging technologies for academic, operational, and administrative value.

- Effective communication is a critical aspect of successfully implementing and maintaining the initiatives that comprise the IT Strategic Plan. Accordingly, clear, consistent, and accurate communication on behalf of University leadership is required.

Process for Sustaining the Plan

The IT Strategic Plan is a "living plan". Similar to the Academic Strategic Plan, it is intended to be dynamic and ambitious. Although the mission and core values of URI remain consistent, technology initiatives set forth in the Plan require ongoing assessment. The technology landscape will continue to change and this plan needs to evolve with and respond to that change. Accordingly, as part of adopting this plan, URI will establish an annual technology evaluation and plan update process.

The University's formal body for IT governance, the IT Strategic Governance Committee (ITGov) and its contributing bodies, have important roles in both implementing and sustaining the IT Strategic Plan. ITGov proposes the following annual cycle for IT Strategic Planning updates that will guide the University in prioritizing technology planning and budgeting activities.

Project Planning and Resource Allocation

Assessment

July — Self-assessment of IT Planning Process

April – June — Update IT Portfolio for Next Fiscal Year Based on Finalized IT Budget, and Communicate to URI

August (or close of Fiscal Cycle) — Financial Review of IT (Analysis of University-wide IT Spending)

March — Submit Final Budget and IT Priorities to SBPCC

September — Communicate the State of IT at URI Through the Governance Process

Prioritizing and Decision-Making

December – February — Define IT Funding and Prioritization

October/November — IT Strategic Plan Updates

IT Strategic Plan Updates with University-wide Participation

Many of the components of this planning cycle are already occurring at the University. However, these efforts have not been formalized, and are often not visible to impacted stakeholders. By establishing a formalized IT planning model, the University demonstrates a commitment to a more intentional and proactive planning approach. This model also recognizes that opportunities and threats are often unpredictable. Accordingly, the planning cycle is intended to be flexible and adaptable, with built-in mechanisms for responding to new priorities, challenges, and mandates that will arise.

Throughout the development of the IT Strategic Plan, URI has undertaken a collaborative approach to planning that has broadly engaged the campus community. This has provided a framework for input from academic, research, and administrative stakeholders and campus leadership and from students, staff, and faculty. Future ongoing campus-wide engagement in the planning process will be critical to its success.

By establishing a University-wide technology planning approach, working to standardize tools and applications (where appropriate), and developing a repeatable process for setting technology priorities, University leadership has a more complete picture of resources, materials, and capabilities.

The coordination of centralized IT services via ITS with needed distributed service provisions must include proactive mechanisms for ensuring and improving communications across units providing similar services. The University's Chief Information Officer will be the accountable IT leader at URI and will need to ensure collaborative approaches and abundant communication that reflects and highlights the best interests of the university first and foremost Further, distributed service providers and centers also must be open to new ways of doing business and sharing expertise and information that advances the university broadly.

To obtain the full benefits of technology investments and expertise, the University must also identify and plan for new business process designs that streamline operations and improve customer service. The university community must highlight and celebrate the services provided by critical offices and personnel and collectively encourage, support, and acknowledge the benefits provided by efficient and effective service systems at the University. Please refer to the appendix for defining "common good" IT services.

Section 5 | Appendices Supporting the Plan

The following appendices have been provided in support of the plan elements and to provide additional background for URI to consider in its planning efforts.

Summary of IT Planning Work Sessions Held Spring 2016

Work Session	Date	ITGov Sponsor	Session Topic Considerations
Technology for Teaching and Learning Agenda	March 28 10:00 a.m. – 1:00 p.m. Multi-Cultural Student Services Center, Hardge Forum	Bahram Nassersharif	How can the IT community better support the core mission of URI? What IT roles and services can URI create or repurpose that will enable students, faculty, and researchers to better meet their objectives for teaching and learning?
Process Improvement and Enterprise Systems Agenda	March 29 9:00 a.m. – 2:00 p.m. Memorial Union, Student Senate Chambers, Room 300	Sharon Bell	How can URI better use the investments it has made in administrative systems to streamline administrative functions? What opportunities exist to reduce customizations and eliminate costs that can be redeployed to support the core mission of URI?
Technology for Research and HPC Agenda In session video	April 7 9:30 a.m. – 1:00 p.m. Memorial Union, Gallery	Joan Peckham	How can the IT community better support the research mission of URI? What IT roles and services can URI create or repurpose that will enable faculty and researchers to better meet their objectives? What services need to be created to support an HPC environment?
Infrastructure and Security Agenda In session video1, video2, video3	April 8 9:00 a.m. – 2:00 p.m. Memorial Union, Student Senate Chambers, Room 300	Mike Khalfayan	What technology investments should URI focus its attention on to better meet the needs of students, faculty, and staff? How can technology be deployed to support teaching, learning, and research in ways that reduce duplication of investment? Are there technologies now managed and operated by URI that can be more effectively deployed?
IT Service Delivery Agenda In session video	April 11 10:00 a.m. – 2:30 p.m. Memorial Union, Student Senate Chambers, Room 300	Mike Motta	What should an IT service catalog look like at URI? What services should be owned by ITS and what services are better served by non-ITS? How will the University manage IT service delivery going forward to improve efficacy, reduce duplication, and increase the value that IT delivers to the URI community?

Work Session	Date	ITGov Sponsor	Session Topic Considerations
IT Organization Agenda In session video1, video2	April 12 8:30 a.m. – 1:00 p.m. Carothers Library, Galanti Lounge	Dean Libutti	What is the right mix of central and non-central resources at the University? How can the IT community improve its coordination and collaboration to eliminate or reduce duplication and strengthen customer service? What training and professional development investments can be made to meet the needs of IT staff across the University?
Communications and Change Management Agenda In session video1, video2	May 4 10:00 a.m. – 2:30 p.m. Memorial Union, Student Senate Chambers, Room 300	Kathleen Torrens	How to increase awareness and understanding of the services and people that support IT? What communication mechanisms can most effectively support improved service delivery? How will URI support change and monitor implementation of IT planning initiatives?

Defining IT Common Good Services

Suggested Guide for IT Service Delivery Assessment