

UNIVERSITY OF RHODE ISLAND

Review of AMRC Sub-committee Report on Information Technology
February 26, 2015

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Introduction

- In 2012 the University conducted a broad review of its use and management of information technology. The review was a component of a broader initiative, AMRC, to examine administrative structures and practices to improve efficiency and service, and reduce costs.
- In 2014, Provost DeHayes and Vice President Valentino appointed an IT Steering Committee to coordinate the on-going consideration and implementation of the AMRC's recommendations for information technology. Consultant Phil Goldstein was retained to support the Steering Committee by developing an IT governance structure for the University and reviewing the work of the AMRC IT sub-committee.
- This document summarizes Goldstein's review of the AMRC IT sub-committee recommendations. Its based on an analysis of the sub-committee's final report and the supporting data gathered to support its findings. This report presents overall impressions of the sub-committee's work, detailed observations about each of its recommendations, and highlights implications for how the Steering Committee and University IT leadership move forward with the implementation of its recommendations.

EXECUTIVE SUMMARY

Broad Observations on the AMRC-IT Report

- The sub-committee's work methods were aligned with its charge and provided broad opportunity for input.
 - The analysis provides baseline data on overall IT staffing and spending; however, additional analyses of discrete IT services are required.
- The AMRC sub-committee's work identified several foundational issues that must be addressed to facilitate efficiency and effectiveness.
 - Mature governance processes, a university-wide IT strategy and better mechanisms to develop the IT workforce and manage IT services are prerequisites to increasing the value the University derives from its IT investments.
- The report calls out several strategic areas that are important to the University's future competitiveness.
 - Opportunities warranting full exploration in a focused strategic planning processes include research computing, analytics, support for online learning, classroom technology.
- The report is not a call for centralization but for a nuanced analysis of the degree of centralization or decentralization that is optimal for particular IT services and units.
 - AMRC recognizes the need for distributed IT resources and the flexibility for units to create distinct services to meet unique needs. To maintain an efficient IT environment, its important to pursue recommendations to review individual services to reduce unnecessary duplication and improve coordination between central and departmental IT.
- Finally, the report identifies significant areas of risk to business continuity and information security that warrant sustained and prompt attention.

Recommended Actions

- URI should fully support the implementation of the AMRC's recommendations. The governance, strategic planning, and operational process improvement recommendations must be implemented in concert with one another to create a more efficient and effective IT environment.
- This commentary suggests ways of implementing the AMRC's recommendations and suggests additional measures for URI to take.
- Highlighted in the tables on the following pages are the actions that are most important to take in the near, intermediate and long-term.
 - Near-term actions address areas of risk and lay the groundwork for the adoption of governance and the development of strategy.
 - Intermediate actions implement governance changes and initiate service improvements.
 - Long-term actions improve the balance of centralization and decentralization, further improve services and create organizational capacity to implement a new strategic plan.

Short-term - Next Three Months

Area	Action
Risk	<ul style="list-style-type: none"> Review the current capabilities to restore systems and services in the event of disasters that render all or part of campus data centers unusable. For systems with unacceptably long times required to recover services, develop recommendations to reduce the time required to restore services (see table 3, page 29 for list of services to examine). Develop information security policies and recommended practices for secure computing. Charge the ISO and CIO with presenting a summary of known information security vulnerabilities and recommended mitigation strategies to the Provost and CFO. Present high priority mitigation strategies to the President's Council, Faculty Senate Executive Committee and Dean's Council to build support for required actions.
Strategy	<ul style="list-style-type: none"> Charge the Steering Committee to develop a set of framing questions for the strategic plan. Share questions with ITS leadership, UTN, Council of Deans and other groups for input and validation. Retain a consultant for strategic planning. Charge the Steering Committee to host cross organizational discussions for areas of emerging needs shared by multiple units: analytics, CRM
Governance/ Organization	<ul style="list-style-type: none"> Develop and socialize the overall IT Governance design. Appoint and charge a senior IT governance committee by June 1. Form UTN sub-committees and define an issue or question for each sub-committee to work through over the summer (e.g., security, Google Apps, user support).

Intermediate – 3 to 9 months

Area	Action
Risk	<ul style="list-style-type: none"> • Implement required improvements to business continuity plans to improve ability to prevent and recover from disasters for core systems. • Seek approval of new information security policies. • Implement measures as required to immediately improve security of sensitive data – accelerate consolidation of servers into data center, review security practices in offices that handle high risk data, complete implementation of encryption solution for cloud based services.
Strategy	<ul style="list-style-type: none"> • Commission a targeted strategic planning effort to surface immediate priorities and three year action plans in focus areas including – research computing, analytics, support for e-Learning, improving the student experience, and operational efficiency.
Governance	<ul style="list-style-type: none"> • Implement major IT governance recommendations. • Engage the Faculty Senate Committee on Technology in the new governance model. • Develop a project portfolio to track major IT initiatives – in progress and under review. • Charge the CIO to work with the senior governance committee to implement a standard process to propose, analyze and approve new IT initiatives – tie to recommendation to require ITS approval of IT procurements.
Organization	<ul style="list-style-type: none"> • Review staffing and skills in ITS and identify strategies to reduce dependency on singular individuals. • Initiate training for ITS staff and leadership and member of the UTN community in ITIL. • Assign responsibility for staff to facilitate governance committees – projected needs include a senior staff member for planning and communication, and an analyst.

Intermediate – 3 to 9 months

Area	Action
Service	<ul style="list-style-type: none"> • Charge ITS to work with UTN stakeholders to optimize the use of Google apps. • Clarify division of responsibilities and support model for web pages between ITS, Marketing and staff in departments. • Charge ITS to review existing service and project requests with appropriate stakeholders. Identify priority projects and review a six month action plan with new governance committee.
Procurement	<ul style="list-style-type: none"> • Review and update as necessary standard computer configurations and phase in the requirement to buy computers through Ram Computers. • Develop a strategy to work with the state to receive delegated authority for managing a broader range of IT procurements. Seek strategies to pre-qualify cloud vendors that can be used on an as-needed basis and authority to buy directly through pre-established consortia, such as Internet 2. • Acquire fiscal flexibility to carry forward budget balances to minimize end of year purchases that aren't planned or strategic.

Long-Term – 9 to 18 months

Area	Action
Risk	<ul style="list-style-type: none"> • Evaluate contracting with a third party to assess information security vulnerabilities. • Implement information security policies and provide expanded training on security awareness and practices. • Expand business continuity planning to incorporate more technologies and business processes. • Initiate regular testing of business continuity strategies.
Strategy	<ul style="list-style-type: none"> • Charge ITS to develop a five year financial forecast of IT capital investment requirements for technology maintenance, replacement and known strategic projects. • Other TBD – based on strategic plan outcomes
Governance	<ul style="list-style-type: none"> • Continue work of governance committee. Engage the committees in prioritizing strategic planning outcomes. • Engage governance in reviewing proposals to adjust IT services to improve performance and rebalance, as necessary, central and local responsibilities.
Organization	<ul style="list-style-type: none"> • Develop a competency model for ITS to be used in performance planning, evaluations and professional development. Design the model with UTN participation to enable its further roll-out to all IT staff at URI. • Charge the CIO to develop a staffing plan for ITS to respond to the strategic plan. Identify priorities for staff development to support new strategies, required changes to enable staff to be re-allocated to emerging areas of need and new hires to support new skill areas (e.g., research computing). • Continue training in ITIL and project management.

Long-Term – 9 to 18 months

Area	Action
Services	<ul style="list-style-type: none">• Complete an end to end review of user support processes including the help desk, self-help and remote support capabilities, use of knowledge bases and improved coordination of roles of ITS and distributed staff in user support.• Charge ITS to implement a service catalog to better communicate available technology services and enable constituents to access service more efficiently.• Charge ITS to work with governance to develop and report service metrics.

Conclusions

- The **AMRC sub-committee's recommendations are appropriate and consistent with effective IT practice** and improvement initiatives at other institutions.
- Building the recommendations on a foundation of **improved governance, communication and IT services is critical to progress** on strategic objectives and create the conditions for better coordination.
- The extent of **service duplication and fragmentation warrants closer examination** to determine what actions should be taken.
- Disaster recovery capabilities and information security strategies should receive more detailed examination and **immediate action in acute areas**.
- **Strategic IT planning is a logical next step**. However, the University should consider an initial planning process that is **economical and focused on a shorter time horizon**.
 - There is a substantial amount of work to be done to address the recommendations already surfaced by the AMRC process. The University should be judicious about layering too many new requirements on top of this.
 - A focused planning process to identify near-term strategic priorities followed in two years by more extensive planning could better serve the University's needs and accommodate its current constraints. This timeline would also accommodate long-range financial planning to identify reinvestment opportunities within existing IT budgets and surface priorities for additional resources.
- The recommended actions constitute a **substantial agenda for change in practice, decision-making and culture both within ITS and across the University**. Coordinated decision-making, shared priorities, and redistributed responsibilities for services won't be possible without greater transparency and trust.
- Successful implementation will require **active sponsorship** from the Provost and Chief Financial Officer and **engaged and active leadership** from the Chief Information Officer and other senior IT leaders. Strong shared IT governance structures will greatly facilitate change, but can't take the place of strong personal leadership.

REVIEW OF AMRC RECOMMENDATIONS

Analysis and Additional Considerations

Commentary on Recommendations

- Commentary on the AMRC's recommendations has two components, an overall assessment of the specific recommendation and additional issues or actions for the IT Steering Committee's consideration.
- AMRC IT recommendations covered six major aspects of IT: ***organization, governance, managing IT purchases, effective IT services, risk management and strategy***.
 - To simplify the presentation and recognize the inter-relationships among detailed recommendations, commentary on the AMRC report is organized around these areas.
 - Table 1 maps the six areas to the detailed recommendations.
- Organization, governance and strategy are broad multi-dimensional topics that warrant deeper analysis.
 - Commentary on structure and governance is preliminary and will be updated at the conclusion of the consultancy.
 - The University will be developing an IT strategic plan shortly and this report offers initial guidance to address the strategic topics raised by the AMRC sub-committee.

Table 1 – Organization of Commentary

Area	Relevant AMRC Recommendations	
	#	Topic
Organization	1	Hire a consultant to review IT structure
	5	Improve IT Staff Development and Management
Governance	2	Establish an IT Governance Committee
IT Purchases	6	Desktop and Laptop Purchases
	7	Approval of IT Purchases
	8	Coordination with the State
	9	Fiscal management practices
Effective IT Services	4	Establish IT processes and methods
	10	ITS service level agreements
Risk Management	13	Security, disaster recovery and business continuity
Strategy	12	Sourcing strategy frameworks
	11	Analytics
	14	IT for Research
	15	Classroom and online technologies
	16	Virtual desktops and servers

Commentary - Organization

AMRC Recommendations

- Retain a consultant to review the IT organization structure at the University
- Improve IT staff development and management

Analysis

- The degree of decentralization of IT staffing and spending is typical for an institution of URI's size and isn't necessarily an inefficient structure.
 - Research universities tend to have between 40% and 60% of their IT resources organized outside of the central IT unit.
 - Distributed IT organizations are effective means to support specialized research technologies, embed expertise to optimize administrative processes and configure administrative software, and provide "premium" or customized support to faculty and staff.
- The report identifies coordinating procurement, avoiding duplication of services, implementing standards and coordinating response to information security threats as problematic in the current structure. While these are significant issues, their root cause is more likely the lack of strategy, governance and trust than the organizational reporting relationships of distributed IT staff.
- More detailed analysis will be required to confirm if services are being duplicated. The analysis by position title and the survey of activities is helpful, but too high-level to pinpoint particular examples of service duplication.
 - For example, an extrapolation of the data collected through the activity survey suggests that nearly 12 FTE outside of ITS are focused on server administration. What isn't clear is how much of this could be consolidated, such as managing local file storage, and how much is devoted to more unique activities, such as managing research servers or servers in specialized teaching labs.

Commentary - Organization

Analysis (Continued)

- Similarly, an extrapolation of the survey results projects nearly 10 FTE are working on web pages. What isn't clear is the extent to which this is effort to maintain the content of web pages, which is less effectively centralized, and how much is dedicated to activities that can become shared services such as web site design, managing web site infrastructure, and web application development.
- Recommendations to improve staff development and performance management practices are consistent with sound management and important to efficiency and effectiveness.
 - As the report points out, technical currency and baseline capabilities in project management and service delivery are important to efficiency. Additionally, a well trained IT staff prevents service failures and reduces the risk of information security breaches.
 - Technological changes, the introduction of new roles/services for IT organizations and new sourcing strategies (e.g., cloud services) are changing the composition of skills required in the IT workforce. The cost of accommodating these changes through new hires is prohibitive and a concerted effort to retrain staff to assume new roles is critical.
 - The success of IT professionals and IT organizations is increasingly a by-product of non technical competencies. Staff members' personal and university sponsored professional development and performance management plans should recognize the importance of additional competencies including communications, negotiations, problem solving, and team leadership.

Commentary - Organization

- **Considerations**

- Perform more detailed analysis of the cost of services and the degree of duplication and fragmentation for specific opportunities, rather than conducting an across the board study. Table 2 lists several opportunity areas.
- Leverage governance rather than redrawn reporting lines to improve coordination between distributed IT teams and ITS. Charge governance with establishing policies and practices to coordinate IT procurement and promote adherence to IT risk management practices.
- Develop a competency model for the IT workforce and use it to guide performance evaluations and professional development.
- Use defined competencies and required levels of mastery for IT positions to create an internal certification that enables delegated authority for some IT tasks performed by distributed units.
- Charge the CIO to review staffing and skill levels across ITS and identify areas where the University is overly dependent on key personnel with no back-up. Take steps to mitigate overdependence on singular resources through cross-training and improved documentation of jobs and tasks. Consider URI's ability to hire and retain appropriate skills to support a technology in sourcing decisions. In some cases, it may be more effective to opt for hosted solutions or third party services in areas where URI can't or hasn't built sufficient depth of expertise to operate the service well.
- As overall university leader for technology, charge the CIO with creating a professional development and performance management strategy for all IT professionals at URI.
 - The CIO should formally advise deans and vice presidents on the IT competencies and staffing required in their areas.
 - As trust builds, consider establishing a dotted or dual line reporting relationship for the leaders of distributed IT units to the CIO. The additional reporting line would create mutual accountability for performance management, professional development, policy implementation and service coordination.

Commentary - Organization

Table 2: Potential Opportunity Areas Warranting Further Analysis

Activity	Partial FTE*	Potential Opportunities Based on Other Institutions
Web pages	9.8	Shared service for web site design and maintenance. Hosting service for departmental and personal pages.
Servers	3.1	Co-locate servers in managed data center. Provide shared system administration services. Provide cloud based solutions for storage.
Network	1.6	Streamline guest and remote access.
Computer Hardware	3.5	Standardize hardware configurations, replace hardware at regular intervals
Admin Software	4.8	Cross train help desk, increase online self-help resources Provide remote support tools
Computer labs	4.4	Virtualize labs and/or provide tools to manage lab images remotely through a shared service.

* Projected level of effort of distributed FTE estimated from AMRC Activity Analysis

Commentary - Governance

AMRC Recommendations

- Establish an IT governance committee to oversee strategic goals and prioritization for information technology.

Governance is a major objective of this consultancy and will be developed through future consultations with the Steering Committee and conversations with many stakeholders. Therefore, it is touched on only briefly in this section.

Analysis

- URI should proceed with the AMRC recommendation to establish IT governance. Governance structures and processes will facilitate development of strategy, advocate for technology investment in the context of other institutional priorities, and improve coordination among central and distributed IT units.
- The creation of a senior IT governance committee is necessary, but not sufficient. Effective governance also requires:
 - Delineation of decision making authority and accountability of the committee(s), the CIO and ITS leadership, and other stakeholders.
 - Well developed supporting processes to identify and evaluate technology investment opportunities.
 - Measures of service performance and mechanisms to monitor and adjust quality of university-wide IT services.
 - Mechanisms to monitor implementation of governance committee decisions and promote accountability.

Commentary - Governance

Analysis (continued)

- Sub-committees or communities of interest focused on particular technology domains (e.g., research) or topics (e.g., standards and architecture) would complement the senior governance committee and inform its decisions.
 - Additional groups whether organized formally or informally provide an opportunity to bring together stakeholders and IT leaders with expertise and interest in particular areas of focus.
 - The groups could be delegated responsibility to recommend strategies or set priorities for areas of technology. In addition, they can be sources of improvement ideas or sounding boards for the design of particular services or initiatives.
- Effective governance requires active staff support to facilitate meeting preparation, frame agendas and decisions, and provide data to inform discussions.

Considerations

- Detailed recommendations will be developed in February and March.

Commentary – IT Purchases

AMRC Recommendations

Purchase standard desktops and laptops
Require ITS approval of IT purchases
Coordinate purchases with the state
Modify fiscal management practices

Analysis

- The AMRC report identified several reasonable opportunities to reduce the cost of technology acquisition and support by leveraging collective purchasing power and narrowing the breadth of technologies in use at the University.
- Requiring the use of URI Ram Computers to acquire standard configuration of faculty and staff computers is a sound practice that will reduce acquisition costs and improve service. To facilitate implementation, URI should:
 - Review and adjust the standard configurations with stakeholder input annually.
 - Delegate authority and responsibility for selecting the specific device and configuration to an authorized approver in the ordering department.
 - Create a financial incentive to use Ram Computers by sharing a portion of the rebate with an ordering department.
- The ITS review of IT purchases should be broader than a financial control and delivered as a service. To realize the full potential value of this recommendation, ITS should:
 - Create a streamlined approval path, delegate approval authority or exempt routine requests.
 - Intervene before a purchase is planned. Plan larger initiatives proactively with requesting departments before a procurement process is initiated. This will require assigning staff with analyst skills sets to become embedded in the planning processes of schools and administrative units.

Commentary – IT Purchases

Analysis (Continued)

- Evaluate and advise colleges and administrative units on their plans and procurement requests from multiple perspectives including: ability to meet needs with existing solutions, consistency with technology standards and architecture, information security and other risks, and ability of the solution to meet requirements.
- As a last resort, have the authority to stop a purchase that is counter to the interests of the University.
- In addition to the State, opportunities to leverage collective buying power should be exploited through collaborations including NERCOMP and Internet 2 Net Plus Services. To the extent that State procurement policies and practices prevent participation in these collaborations, the University should make it a priority to work with the State to review greater authority in IT procurement. The services organized by Internet 2, in particular, have been pre-vetted by many private and public institutions and offer service levels and contract terms that are responsive to the needs of higher education.
- Fiscal flexibility to carry forward unused balances and accrue reserves to fund future purchases will lead to improved procurement decisions. Additionally, the University should maintain a five year rolling projection of IT capital spending requirements to renew and replace existing technologies and invest in strategic opportunities. Even if unfunded, this baseline will help senior leadership have greater visibility into future IT spending requirements.

Commentary – IT Purchases

Considerations

- Encouraging purchases of standard computer configurations should be broadened to incorporate the idea introduced in the report of moving some staff to less expensive virtual desktops.
 - Strategic planning should also weigh the advantages of offering a “bring your own device” option to faculty and some staff. Such a program would provide an annual technology stipend in lieu of university purchased computing devices to participating individuals.
 - Bring your own device is a longer-term strategy that requires more services to be available online and appropriate measures in place to provide secure access to sensitive and protected data. However, it offers opportunities to provide greater flexibility and to reduce costs.
- The ITS approval of purchases should be inclusive of hardware, software and cloud services. Increasingly the role of the IT analyst will be to help departments make good choices of cloud services that have appropriate security and can be integrated with other campus systems. Often, these services can be acquired without a purchase order or contract. Proactive and on-going communication is required to identify when a unit is considering such a service. Security policies should create an accountability for units to validate that cloud services are in compliance with University requirements.
- AMRC recommended the hiring of an IT procurement specialist. Consider defining this role as an analyst to facilitate outreach to stakeholders, evaluate requirements, identify solution options and facilitate access to ITS services. Likely, more than one such position will be needed to provide full coverage to the university.

Commentary- Effective IT Services

AMRC Recommendations

- Improve IT processes and methods
- Establish ITS service level agreements

Analysis

- AMRC's recommendations to improve the processes and methods used to deliver IT services and execute IT projects are consistent with improvement strategies at other universities and in the private sector.
 - Adoption of cross-industry methodologies and best practices, such as the Information Technology Infrastructure Library (ITIL), is enabling IT organizations to deliver more consistent services, measure service performance, and communicate more effectively with stakeholders.
 - Improvement is a long-term commitment that requires a change in organizational culture, development of new skills sets, vocabulary and practices, and a continual commitment to improving execution. While there are likely opportunities for “quick wins”, URI should approach this as a multi-year improvement program with annual targets and regular measurement of progress.
- The development of a service catalog that defines what ITS supports and the level of support it promises to its constituents is an important part of adopting a framework such as ITIL. The service catalog should be implemented as part of a broader rethinking of how to make it easier for constituents to request and receive support.

Commentary – Effective IT Services

Considerations

- Foundational training in ITIL (or a similar framework) and a project management methodology should be provided to IT staff in ITS and distributed units.
 - A common training experience provides a consistent vocabulary and approach to delivering IT services and projects and a shared experience that contributes to collaboration and trust.
 - All senior IT leaders should participate in the foundational training to set the tone for its importance and to align their participation in planning, project management and service management processes with best practices.
- Early process improvement opportunities include:
 - IT governance will require the University to establish processes for requesting, reviewing and approving new IT investments, projects and services.
 - Even basic metrics of service levels for frequently used services are important to create an atmosphere of transparency and trust, and spurs continual improvement efforts.
- A phased initiative to improve IT service delivery should be implemented. Its scope should include advancing the use of a shared call center, ticketing system and knowledge base, developing service metrics and issue escalation paths, defining a service catalog, and increasing self-service and first-call issue resolution.

Commentary – Risk Management

AMRC Recommendations

- Enhance the role of IT Service Security
- Establish a business continuity and disaster recovery plan

Analysis

- Clarifying and expanding the authority of the Information Security Officer (ISO) to detect risks and audit compliance with effective security practices is essential to safeguarding University data and personal information. The ISO in consultation with IT governance should be empowered to establish security policies and practices that pertain to all technologies and services regardless of whether they are maintained by ITS, a distributed unit or a third party.
- AMRC's recommendations to understand the vulnerabilities of the University to the prolonged loss of availability of major technologies and develop plans to mitigate risk and reduce the time to recover from disaster should be implemented.
 - Understanding the degree of vulnerability and prioritizing the criticality of major systems and defining acceptable periods of time to recover systems in the event of disaster will influence investment priorities, sourcing strategies (e.g., use of cloud hosting with built in redundancy), and the operational strategies of non-IT service units on campus.
 - IT governance should establish responsibilities for IT risk management and connect it to overall University risk management and disaster planning.

Commentary – Risk Management

Considerations

- Buttressing information security should also include the development of additional policies and recommended practices. Initial audits may suggest other interventions.
 - Policies should be created to govern acceptable use of URI's technologies and delineate the authority of the Information Security and IT leadership to remove unsecure technologies or users in violation of policy from the network.
 - A data classification policy should be developed to help prioritize the degree of security that should be afforded different types of data based on the risk and impact of unauthorized disclosure. Support should be provided to implement additional measures to secure legally protected and sensitive data. Audits of where sensitive data currently resides and how it is secured should be systematically undertaken.
 - Define in policy or official practice responsible stewards for classes of data and systems. Owners are responsible for establishing the rules that govern appropriate access and use of data and work with Information Security and Risk Management leadership to track regulatory requirements and develop processes to enable effective compliance.
 - Additionally, broad information security awareness campaigns should be developed and integrated into faculty, student and staff orientation and training.
- Immediate action should be taken to identify any significant vulnerabilities of existing systems to disaster and a prioritized action plan developed to reduce the time required to restore these systems in the case of a limited scope disaster.
 - Redundant systems, outsourcing and alternative data center sites should be explored to reduce vulnerability of critical systems (see table 3). The table is illustrative of typical points of vulnerability.
 - Developing full business continuity plans is complex and requires extensive engagement from academic and administrative leaders. Its an important exercise that should be undertaken once immediate disaster recovery issues are identified and addressed.

Commentary – Risk Management

Table 3 - Potential Areas of Focus for Disaster Recovery Planning

Potentially Vulnerable Technologies	Potential Strategies
Main University Web Pages	Third party hosting of all web sites Alternative “hot site” to support main pages
Connectivity of the Campus Network to the internet	Secure redundant connection points to reduce vulnerability to equipment failure or cable cuts
PeopleSoft and Related Administrative Software Solutions	Secondary data center remote from campus. Options range from constant mirroring of production environment to pre-negotiated access to re-install systems in case of loss of primary data center
Learning Management System	Being addressed through third party hosting
Research services and data	Continue to move servers into managed data centers with off-site back-up services for data and applications. Offer disaster recovery services to restore systems in an off-site data center
Email	Addressed through Google agreement
File Storage	Provide cloud based storage with a third party or off-site back-up option for locally stored files

Commentary – IT Strategy

AMRC Recommendations

- Develop an IT strategic plan
- Improve analytics
- Enhance IT support for research
- Support classroom and online technologies
- Pilot virtual desktops and servers
- Evaluate moving services to vendors

Analysis

- AMRC's recommendation to develop an overall strategic plan is sound and will elevate the discussion of technology beyond the immediate tactical concerns that are foremost on constituents' minds.
- Further, the areas that AMRC called out in its recommendations as focal points for enhanced technology support, analytics, research, classroom and online teaching, and strategic sourcing, are important topics for planning. Each area is complex and will require a multi-phased improvement strategy.
 - Progress in analytics, teaching with technology and research computing requires strategies to acquire and enhance technologies, extend support services, and achieve higher levels of organizational collaboration.
 - Table 4 provides examples of framing questions the University may want to incorporate in its IT planning process.

Commentary – IT Strategy

Table 4: Sample IT Planning Questions

Topic	Framing Questions
Analytics	<ul style="list-style-type: none"> • What tools and training are required to improve access to transactional reports? • What infrastructure (e.g., warehouse) or third-party relationship is required to support predictive modeling and other advanced applications of analytics? • Are appropriate data capture processes in place? • What capacity will be required to analyze unstructured data or to combine data from internal and external sources? • How will the University organize staff support for analytics?
Classroom and Online Learning Technology	<ul style="list-style-type: none"> • How will the use of mobile devices in classrooms expand and what infrastructure is required to support it? • What flexible space and technology designs are required to enable faculty to explore new teaching methods? • What other learning spaces require technology? • How will labs and computer classrooms evolve? • What support and technology resources are required to support online learning strategies and broader use of technology in face to face classes?
Research Computing	<ul style="list-style-type: none"> • What infrastructure is required to support multi-investigator research projects that cross disciplines and institutional boundaries? • What shared resources for research computing would be advantageous (e.g. high performance cluster) and how should shared facilities be organized and governed? • What research technologies should be provisioned in sufficient capacity to afford opportunities to students and unfunded faculty researchers? • What expertise and staff support is needed to facilitate adoption of research technologies in the humanities and social sciences?

Commentary – IT Strategy

Considerations

- Include in the scope of IT strategic planning the future of administrative systems and technology in support of student success.
 - The former is important given the backlog of acquired, but not deployed administrative software, and the general evolution of administrative systems towards software as a service.
 - The latter is an opportunity to evaluate how effectively technology is supporting students throughout the entire student life-cycle and to examine the use of technology and data in enrollment management and retention strategies, advising,
- IT planning should also consider the implications of several technology developments including the evolution of identity management solutions, mobile technologies and the increasing number of internet connected devices that capture data that can be used in research, design of services or tracking of service quality. These external drivers of change have implications for infrastructure planning, security and access management and open up new possibilities for data collection, service delivery and collaboration.

CONCLUSIONS

Conclusions

- The **AMRC sub-committee's recommendations are appropriate and consistent with effective IT practice** and improvement initiatives at other institutions.
- Building the recommendations on a foundation of **improved governance, communication and IT services is critical to progress** on strategic objectives and create the conditions for better coordination.
- The extent of **service duplication and fragmentation warrants closer examination** to determine what actions should be taken.
- Disaster recovery capabilities and information security strategies should receive more detailed examination and **immediate action in acute areas**.
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 - There is a substantial amount of work to be done to address the recommendations already surfaced by the AMRC process. The University should be judicious about layering too many new requirements on top of this.
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- The recommended actions constitute a **substantial agenda for change in practice, decision-making and culture both within ITS and across the University**. Coordinated decision-making, shared priorities, and redistributed responsibilities for services won't be possible without greater transparency and trust.
- Successful implementation will require **active sponsorship** from the Provost and Chief Financial Officer and **engaged and active leadership** from the Chief Information Officer and other senior IT leaders. Strong shared IT governance structures will greatly facilitate change, but can't take the place of strong personal leadership.