Boston University Technology Plan

FY 2015–2020

BU

Boston University Information Services & Technology

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Background: Technology @ BU

FY 2010-14 Goals

In fiscal years 2010–14, BU Information Services & Technology has been pursuing a strategy of "One IS&T for One BU," focused on the following goals:

- Strengthened Partnerships in Teaching and Research
- Shared Support Services
- Renewed Enterprise Applications
- Shared Infrastructure Services
- Portfolio & Project Management
- Service Management

These goals have been pursued with the full support and assistance of local technology service organizations. Examples of major initiatives in support of these goals include:

Strengthened Partnerships in Teaching and Research

- Installation and upgrading of classroom technology in all University Registrar classrooms
- Creation of full-time staff Instructional Technology Support Specialists and Educational Technologists
- Partnering to create the Massachusetts Green High Performance Computing Center
- Creation of a shared research computing cluster and buy-in program

Shared Support Services

- Creation of the IT Help Center and enterprise IT Service Desk function
- Implementation of the Desktop Support Clustering initiative

Renewed Enterprise Applications

- Implementation of SAP for Finance, HR, and Procurement functions (BUworks)
- Implementation of Blackbaud ECRM for Development and Alumni Relations
- Implementation of Kuali Coeus for Research Administration Award processing
- Reimplementation of DegreeWorks for BU Degree Advice
- Upgrade and consolidation of learning management systems to Blackboard Learn 9.1

Shared Infrastructure Services

- Installation of wireless networking in all classrooms and residence halls
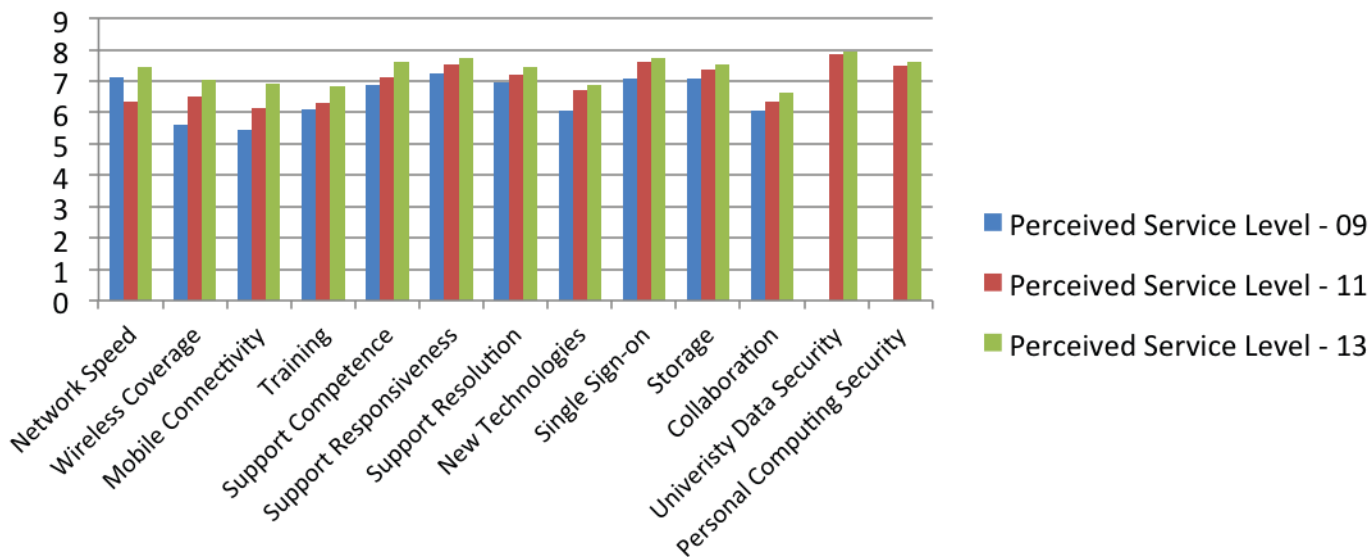
- Installation of wireless networking in academic and administrative spaces (in progress)
- Deployment of Google mail services for students
- Deployment of an enterprise Microsoft Exchange email and calendar platform for all faculty and staff
- Deployment of an enterprise data archive storage service

These initiatives have been enabled through the implementation of **portfolio and project management** best practices, including the development of a robust project management office, governance structure and process. In addition, implementation of ITIL-based IT **service management** processes and tools has supported the establishment of shared services.

Community Satisfaction

IS&T has been measuring community satisfaction with the quality of technology services at BU through the TechQual+ survey, a standard survey developed by higher education IT leaders for higher education. We administered the survey in the fall of 2009, 2011, and 2013.

2013 Survey results showed positive gains in several areas, accompanied by rising expectations. The largest changes in perceived service level by the campus community as a whole are reflected in the chart below:

At the same time, expectations rose in 2013 as shown below:

Legend:
- Minimum Service Level - 09
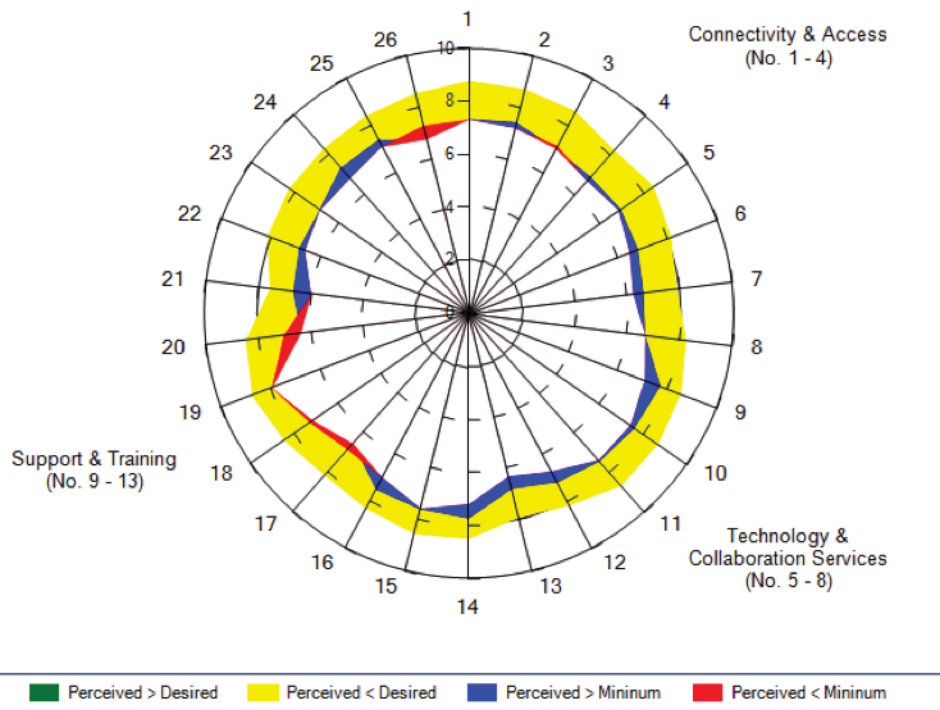- Minimum Service Level - 11
- Minimum Service Level - 13

This resulted in the following differences between minimum and perceived service levels for the 1331 student, faculty and staff respondents overall. Red indicates service areas where perceived levels fall below minimums, while blue indicates areas where perceived levels exceed the minimum.

Legend: Perceived > Desired | Perceived < Desired | Perceived > Mininum | Perceived < Mininum

Satisfaction with technology services is highest among students and lowest among faculty. Areas of most common gaps between expectations and service provided are wireless coverage (question

3), classroom technology (question 8), assessment systems (question 17), research support (question 18), central information system security (question 19), Finance and HR information systems (faculty/staff question only, 20), and student information systems (faculty/staff question only, 26).

Service Health

IS&T monitors the health of the services in our service catalog, as well as the corresponding operational costs of those services. These health charts are attached as Appendix A. They reflect the following notable risks in the BU technology service environment:

*   BU still has a set of core administrative systems that are end of life and require renewal or, at a minimum, support risk mitigation, including Student Information Systems, Ancillary Systems, and non-SAP Finance, HR and Budget systems.
*   BU telephone services are also at end of life and need to be replaced/migrated to newer, unified communications technology.
*   BU has a basic set of information security services, most of which are current, but is lacking in advanced functionality and maturity/breadth of deployment of current services.
*   BU has some research computing facilities, such as the IBM Blue Gene, that are end of life. Visualization capabilities are also late in their life cycle.
*   The BU network infrastructure is in need of a refresh program; Authentication, Directory and Storage Services are in need of renewal.

Benchmarks

BU Technology Service benchmarks are drawn from the Educause Core Data survey and TechQual+ Survey tools. In accordance with the terms and conditions of use for these resources, these documents are available to BU community members only upon request.
Please contact vpist@bu.edu for access.

Key Trends

The BU community and governance committees have spent a significant amount of time considering current trends in higher education and technology over the course of this planning process. Trends of particular note to which these groups agreed we must respond include:

*   The transformation of teaching and learning through technology-enabled pedagogies. Beyond MOOCs, BU exists in a rapidly changing context of what higher education is and will be in the future.
*   Analytics and Big Data. BU will need to be able to collect, secure, analyze, manage, and retire massive volumes of research and, at least potentially, academic and administrative data.
*   Global connectedness and collaboration. Today BU's faculty and students can be found in 75 countries on 7 continents, and we collaborate not only across disciplines and colleges, but across institutions and industries. The power of social media and new collaboration

technologies should be harnessed in the interest of BU goals.

- Usability, including mobility. Today's students, faculty and staff need to be able to access services from anywhere, on any device, through an intuitive interface comparable to consumer services.

- Information security as a core competency. Information security threats and consequent regulatory requirements are increasingly pervasive and complex.

- Extreme pressure to control or reduce the cost of education. With higher education having been identified as having "cost disease," BU must work to leverage technology to reduce administrative overhead costs and identify new, more efficient operating models.

- The abstraction of IT services from the physical campus, and transition of IT staff from builders of systems to architects and integrators of services. With pervasive, high bandwidth connectivity and the rise of cloud service providers at all levels of technology service, from infrastructure to platform to application, options for ways to provide IT services are diversifying rapidly and require careful selection and management.

- The importance of standards, especially for infrastructure. As the applications and client devices become more varied and rapidly changing, the need for standard to provide interoperability and rapid deployment is increasingly critical.

FY 2015-20 Technology Plan: Executive Summary

Goal

To enable the realization of the goals articulated in the BU strategic plan, Choosing to be Great, and the mitigation of Boston University enterprise risks, through the development, sustainment and optimization of information services and technology.

INNOVATIVE
USABLE
GLOBAL **OPEN** **SECURE**
PROFESSIONAL DEVELOPMENT
SERVICE CULTURE
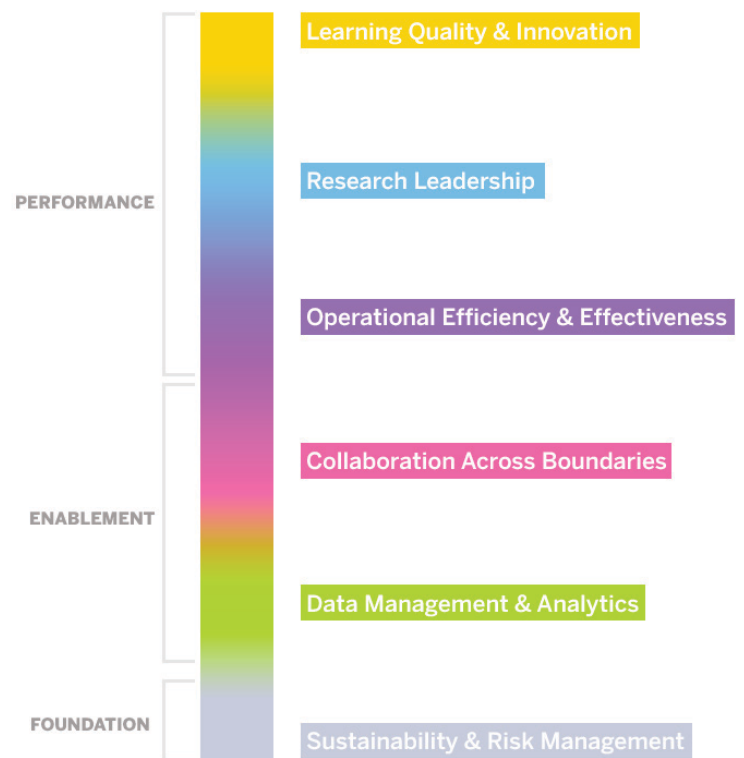**SHARED SERVICES**
GOVERNANCE

Principles

These principles were identified as key concepts that should remain constant for the life of the plan, serving as touchstones to be referenced in the development and execution of technology projects and operations.

Capabilities

These capabilities were identified as core competency areas for information services and technology, within which several strategic initiatives should be carried out over the coming 5 years.

PERFORMANCE
- Learning Quality & Innovation
- Research Leadership
- Operational Efficiency & Effectiveness

ENABLEMENT
- Collaboration Across Boundaries
- Data Management & Analytics

FOUNDATION
- Sustainability & Risk Management

Initiatives

The following 26 initiatives are listed in the order they appear in the plan.

Legend:
- 🟨 Learning Quality & Innovation
- 🟦 Research leadership
- 🟪 Operational Efficiency & Effectiveness
- 🟥 Collaboration Across Boundaries
- 🟩 Data Management & Analytics
- ⬜ Sustainability & Risk Management

Initiative	Learning Quality & Innovation	Research leadership	Operational Efficiency & Effectiveness	Collaboration Across Boundaries	Data Management & Analytics	Sustainability & Risk Management
1. Expand collaboration between technology teams and organizations at BU who provide pedagogical, content, and instructional design to improve coordination, facilitation, and promotional capabilities.	■			■		
2. Ensure that learning platforms support anywhere, anytime use by a diverse, global community in a safe environment. Include support for mobile learning, rich media, voice and video communication, social networking, and emerging forms of assessment.	■			■		
3. Provide quality classroom teaching environments for all courses, and experiment with and support the adoption of innovative classroom technologies.	■					
4. Provide secure repositories and user-friendly analytical tools to access academic information, from official records to course-specific information, in support of teaching effectiveness, student retention and graduation, and pedagogical research.	■		■		■	■
5. Experiment with social networking technologies to develop online communities of practice in teaching, learning, and research.	■	■		■		
6. Build upon the Massachusetts Green High Performance Computing Center to provide sustainable, shared research computing and storage infrastructure to BU researchers.		■				■
7. Develop and implement a campus cyberinfrastructure plan to enhance BU research infrastructure, from the campus network to regional, national, and cloud-based computing resources.		■		■		
8. Provide robust, secure, usable research administration tools to enhance sponsored program management by faculty.		■			■	
9. Support the lifecycle of research, academic, and administrative data in partnership with BU Libraries.		■			■	
10. Partner with Hariri Institute for Computing and Computational Science & Engineering to develop a dynamic, collaborative pool of human resources for the development and support of computational software for research.		■		■		
11. Support and leverage emerging "big data" tools to provide new analytical capabilities for research, teaching, and administration.		■			■	
12. Join peer institutions and industry in developing safe ways to leverage cloud infrastructure for research, including high performance computing and big data.		■				■
13. Enhance administrative systems to improve efficiency and capability, with a primary focus on research and academic administration.			■			
14. Ensure the ability to rapidly and securely provision new services by deploying industry standard Identity and Access Management (IAM).			■			■
15. Expand the digitization of paper records and automation of manual workflows, including electronic signatures.			■			
16. Deploy a professional development system for faculty and administration that tracks the completion of required and elective training in areas such as security awareness, compliance, technical skills, pedagogical or research methodologies, and management.			■			
17. Expand adoption of IT service management best practices, including continued development and implementation of a shared service catalog, ITIL processes, and service management platform.			■			
18. Provide access to user-friendly tools in support of data-driven assessment with a focus on academic and administrative service quality.			■		■	
19. Develop an enterprise data dictionary and governance process in support of data sharing and distributed analysis.					■	
20. Provide support and training to empower faculty and staff to use data in strategic, tactical, and operational decision making.					■	
21. Provide unified, high fidelity services that support one-to-one, one-to-many, or many-to-many communication and collaboration with integrated video, voice, messaging, scheduling, shared workspaces, and social networks.			■	■		
22. Reduce the risk associated with legacy applications by pursuing the replacement of central and local student information systems and developing a roadmap to transition other applications at risk for obsolescence.						■
23. Develop a sustainable funding model and ongoing maintenance plan for the campus data network and core systems infrastaiture.						■
24. Strengthen controls over the systems and devices that host Restricted Use data, and educate users on proper handling.						■
25. Implement an awareness program around the BU Data Protection Standards in partnership with BU academic experts.						■
26. Provide solutions to allow people to easily secure their mobile devices in accordance with BU requirements.						■

Our Plan: Detail

Process & Structure

The Boston University 2015-20 Technology Plan has been developed to guide the evolution of technology infrastructure and services at BU, both by the central technology organization, Information Services & Technology, and local/specialized technology support teams. The Technology Plan supports, both directly and foundationally, the following strategic goals of the University Strategic Plan: Choosing to be Great.

- Strengthening the quality of the faculty.
- Strengthening our commitment to interdisciplinary programs in research, education, and outreach.
- Strengthening the excellence of our undergraduate education.
- Strengthening the student residential community and the student experience.
- Strengthening targeted programs in graduate research and education.
- Strengthening our leadership as an urban and global research university.

Alignment with the BU Strategic Plan will be sustained through review and revision as the University plan is updated.

The Technology Plan also aims to address technology risks identified through the Service Portfolio Health Chart and University's Enterprise Risk Management (ERM) program. Identified technology ERM risks are attached as Appendix B.

Through a combination of engagement with technology leaders, review of emerging trends and best practices, participation in campus focus groups, and internal discussion, the BU technology governance committees have formulated the following Principles and Strategic Capabilities. The Strategic Capabilities each support one or more goals of Choosing to be Great and/or help mitigate Enterprise Risks, and drive multiple technology-related Initiatives. These initiatives have been mapped specifically to Choosing to be Great goals in Appendix C. The Principles are broad guidelines to keep in mind as we move forward with the Initiatives.

Note: throughout, "we" is used to refer to the BU technology services community as a whole, including the central technology organization, Information Services & Technology, and local technology organizations working in partnership.

Principles & Definitions

Principles

These principles were identified as key concepts that should remain constant for the life of the plan, if not beyond, serving as touchstones to be referenced in the development and execution of technology projects and operations.

- Enable resources to be allocated to innovation by providing common services in the most efficient manner possible.
  - Reduce complexity and cost through reasonable standardization.
  - Encourage use of and contribution to shared computing facilities for services that benefit from economies of scale.
  - Provide central licensing (if applicable), vendor/supplier management and support for widely used technologies.
  - Adopt the most cost effective infrastructure, platforms and services that meet BU requirements, regardless of service provider (open source community, BU-hosted, cloud provider, other).
  - Minimize investment in legacy platforms; ensure that new systems provide emerging capabilities expected by end users.
  - Reduce the number of shadow information systems. Where shadow information systems are identified, work with the owner(s) to identify and address the unmet need.
- Invest in professional development.
  - For technology staff in technical, managerial and specific academic and administrative subject areas.
  - For faculty, administrators and staff in the development of pedagogical, computational, analytical and process optimization skills.
- Prioritize accessibility and ease of use in the selection, implementation and promotion of new systems and services, to ensure the broadest impact and benefit to the BU community.
  - Ensure access to services for people with disabilities.
  - Support major platforms, devices, and browsers in use by most BU community members, including personally owned, often mobile devices.
  - Adopt open standards whenever possible.
  - Focus on usability in interface design.
  - Communicate about service availability and capability in non-technical language, via multiple methods.
- Continue to foster and sustain a service oriented culture, in which technology is a means, rather than an end, and value is placed on benefits realized by the BU community. Ensure that service sustainability and continuous improvement are prioritized equally with project activity.
  - Listen to needs.

- Learn from the experiences and feedback of the community.
- Foster innovation by supporting experimentation and providing flexible frameworks and tools.
- Consider BU's global reach in design of infrastructure, information and support services.
- Enable compliance with security requirements by making it easy to do so.
  - Apply appropriate controls to administrative and academic work, respectively.
- Encourage open sharing of data, other content and expertise by making it easy and safe to do so.
- Support the development of infrastructure through a balance of institutional funding, sponsored research grants and industrial support.
- Govern technology services and projects efficiently and effectively, including representation that enables shared services across campuses, while balancing stakeholder engagement with the ability to make timely decisions.

Definitions

- Legacy platform: A platform for which capabilities to sustain and enhance functionality is severely limited or nonexistent. Examples include products which are no longer supported by a vendor or community, or services reliant on underpinning technologies that are no longer competitive in the marketplace or taught in mainstream computer science.
- Shadow system: A system which substantively replicates functionality provided by a central information system in order to provide supplemental ease of use or functionality to a local unit.

Strategic Capabilities

These capabilities were identified as core competency areas for information services and technology, within which several strategic initiatives should be carried out over the coming 5 years.

- **Teaching & Learning Quality and Innovation**
  We will enable BU to be a leader in the development of new learning models, while enhancing the BU community's ability to engage students across disciplines in active, deep learning, using both proven and emerging pedagogical methods.

- **Research Leadership**
  We will renew our commitment to leading research computing infrastructure and support services, especially in fields identified as strategic areas for the University moving forward.

- **Operational Efficiency and Effectiveness**
  We will enable BU to meet or exceed applicable peer and industry benchmarks for operational efficiency and effectiveness in support services, especially in the areas of academic and research administration.

- **Data Management and Analytics**
  We will extend our ability to collect, store, analyze, and disseminate data, including big data, in support of student success, research productivity and administrative effectiveness.

- **Collaboration Across Boundaries**
  We will improve the BU community's ability to discover, connect and interact with each other across historical, organizational, disciplinary, geographic and institutional boundaries.

- **Sustainability and Risk Management**
  We will plan for the renewal of critical technology infrastructure and ensure that security and compliance are consistently addressed.

Initiatives

NOTE: Initiatives which have significant relevance to more than one strategic capability area are listed in each applicable area. Initiatives are listed in priority order for each capability area.

Teaching & Learning Quality and Innovation

We will enable BU to be a leader in the development of new learning models, while enhancing the BU community's ability to engage students across disciplines in active, deep learning, using both proven and emerging pedagogical methods.

Initiatives

1. Expand collaboration between technology teams and the various organizations at BU who provide pedagogical, content, and instructional design support to improve these organizations' cumulative coordination, facilitation, and promotional capabilities.

    a. Provide appropriate access to instructional design and digital media/content production capabilities for faculty and students.

    b. Enable faculty experimentation in educational technology innovation.

    c. Disseminate successful educational technology experiments as best practices, including creation of templates and reusable learning objects.

    d. Facilitate interdisciplinary/interprofessional collaboration in teaching and learning.

2. Ensure that learning platforms support anywhere, anytime teaching and learning by a diverse, global community in a safe environment. Include support for mobile learning, rich media, voice and video communication, social networking, and emerging forms of assessment.

3. Provide quality classroom teaching environments for all courses, and experiment with and support the adoption of innovative classroom technologies.

4. Provide secure data repositories and user-friendly analytical tools to access academic information, from official academic records to course participation information, in support of teaching effectiveness, student retention and graduation, and pedagogical research.

5. Experiment with social networking technologies to build or enhance online communities of practice in teaching, learning, and research.

Research Leadership

We will renew our commitment to leading research computing infrastructure and support services, especially in fields identified as strategic areas for the University moving forward.

Initiatives

1. Build upon the Massachusetts Green High Performance Computing Center to provide sustainable, shared research computing and storage infrastructure to BU researchers.

    a. Forge and support shared infrastructure and research between BU's Charles River and Medical campuses.

    b. Ensure that the research computing infrastructure enables researchers to be competitive for grant funding, and to scale applications to national facilities.

2. Develop and implement a campus cyberinfrastructure plan to continue to enhance BU research infrastructure, from the campus network to regional, national, and cloud-based computing resources.

3. Provide robust, secure, user-friendly research administration data access and analytics, enhancing faculty ability to manage their sponsored programs.

4. In partnership with BU Libraries, support the data lifecycle, including the capability to securely store, protect, share, publish, archive, and expire/retire research, academic, and administrative data in accordance with applicable policies and data management plans.

5. Partner with Hariri Institute for Computing and Computational Science & Engineering to develop a dynamic, collaborative pool of human resources for the development and support of computational software for research.

    a. Enhance support for disciplines and researchers newly engaged in computationally intensive research and data visualization.

    b. Provide opportunities for undergraduate engagement in computational research.

6. Support and leverage emerging "big data" tools and methodologies as appropriate to provide new analytical capabilities for research, teaching and administration.

7. Join peer institutions and industry in developing safe ways to leverage cloud infrastructure for research, including high performance computing and big data.

8. Experiment with social networking technologies to build or enhance online communities of practice in teaching, learning and research.

Operational Efficiency and Effectiveness

We will enable BU to meet or exceed applicable peer and industry benchmarks for operational efficiency and effectiveness in support services, especially in the areas of academic and research administration.

Initiatives

1. Enhance administrative systems to improve efficiency and capability, with a primary focus on research and academic administration.

    a. Support high quality research administration services to faculty through the provision of effective research administration systems.

    b. Consolidate and integrate faculty information systems to enhance ease of data management by faculty and accuracy of reporting.

    c. Evolve student information systems (admission, registration, financial aid, etc.) to enhance the student experience across BU, support strategic academic initiatives and emerging learning and credentialing models, and enable quality relationship management with students and parents.

    d. Enable quality and efficiency in University financial and human resource administration through enhancement of BUworks and related information systems.

2. Ensure the ability to rapidly and securely provision new services by deploying industry standard Identity and Access Management (IAM) infrastructure, including federated identity capabilities.

3. Provide unified, high fidelity communication and collaboration services for one-to-one, one-to-many, or many-to-many voice and video communication that integrate messaging, scheduling, shared workspaces, and social networks via most devices. Make significant progress toward retirement of legacy voice communication services.

4. Expand the digitization of paper records and automation of manual workflows, including electronic signatures. Focus on areas of greatest impact:

    a. Travel and expense processing

    b. Research proposal development

    c. Research grant effort reporting

    d. Visa and permanent residency processing

5. Provide secure data repositories and user-friendly analytical tools to access academic information, from official academic records to course participation information, in support of teaching effectiveness, student retention and graduation, and pedagogical research.

6. Provide user-friendly access to data and analytical tools in support of data-driven assessment, especially for application to assessment of academic and administrative service quality.

7. Deploy a professional development system for faculty and administration that can track the completion of required and elective training, including security awareness, compliance certification, technical skills, pedagogical or research methodology best practices, management skills, and other training.

8. Expand adoption of IT service management best practices, including continued development

and implementation of:
   a. A shared service catalog
   b. Uniform incident, change, problem, and configuration management processes across central and local technology organizations
   c. A common IT service management platform

Data Management and Analytics

We will extend our ability to collect, store, analyze, and disseminate data, including big data, in support of student success, research productivity, and administrative effectiveness.

Initiatives

1. In partnership with BU Libraries, support the data lifecycle, including the capability to securely store, protect, share, publish, archive, and expire/retire research, academic, and administrative data in accordance with applicable policies and data management plans.
2. Provide robust, secure, user-friendly research administration data access and analytics, enhancing faculty ability to manage their sponsored programs.
3. Provide secure data repositories and user-friendly analytical tools to access academic information, from official academic records to course participation information, in support of teaching effectiveness, student retention and graduation, efficient planning of academic programs, and pedagogical research.
4. Provide user-friendly access to data and analytical tools in support of data-driven assessment, especially for application to assessment of academic and administrative service quality.
5. Develop an enterprise data dictionary and data governance process in support of data sharing and distributed analysis.
6. Support and leverage emerging "big data" tools and methodologies as appropriate to provide new analytical capabilities for research, teaching and administration.
7. Provide the support and training required to empower faculty and staff to use data in strategic, tactical, and operational decision making.

Collaboration Across Boundaries

We will improve the BU community's ability to discover, connect and interact with each other across historical, organizational, disciplinary, geographic and institutional boundaries.

Initiatives

1. Provide unified, high fidelity communication and collaboration services for one-to-one, one-to-many, or many-to-many voice and video communication that integrate messaging, scheduling, shared workspaces, and social networks via most devices. Make significant progress toward retirement of legacy voice communication services.

2. Expand collaboration between technology teams and the various organizations at BU who provide pedagogical, content, and instructional design support to expand and improve these organizations' cumulative coordination, facilitation, and promotional capabilities.

3. Ensure that learning platforms support anywhere, anytime teaching and learning by a diverse, global community in a safe environment. Include support for mobile learning, rich media, voice and video communication, social networking, and emerging forms of assessment.

4. Build upon the Massachusetts Green High Performance Computing Center to provide sustainable, shared research computing and storage infrastructure to BU researchers.

    a. Forge and support shared infrastructure and research between BU's Charles River and Medical campuses.

    b. Ensure that the research computing infrastructure enables researchers to be competitive for grant funding, and to scale applications to national facilities.

5. Partner with Hariri Institute for Computing and Computational Science & Engineering to develop a dynamic, collaborative pool of human resources for the development and support of computational software for research.

6. Experiment with social networking technologies to build or enhance online communities of practice in support of teaching, learning and research.

7. Develop and implement a campus cyberinfrastructure plan to continue to enhance BU research infrastructure, from the campus network to regional, national and cloud-based computing resources.

Sustainability and Risk Management

We will plan for the renewal of critical infrastructure and ensure that security and compliance are consistently addressed.

Initiatives

1. Actively manage and reduce the risk associated with BU's legacy administrative applications.
   a. Make significant progress toward replacement of legacy central and local student information systems with core, shared services that enable convenient, personalized student interactions with administration, including Admissions, Financial Aid, Registration, Student Accounts, Student employment, and Housing.
   b. Create a roadmap to transition other legacy applications at risk for obsolescence.
2. Develop a sustainable funding model and refresh process for the campus data network and core systems infrastructure.
3. Strengthen controls over Restricted Use data and the systems and devices that host or may access it. Ensure that all departments know the requirements for proper handling of such information and how to report a compromise of such data.
4. Develop and implement an effective awareness program around the BU Data Protection Standards, which define the differences in security requirements for different types of data. Forge partnerships with BU academic experts to develop information security education, training and outreach.
5. Provide solutions to allow people to easily secure their mobile devices in accordance with BU requirements.
6. Ensure the ability to rapidly and securely provision new services by deploying industry standard Identity and Access Management (IAM) infrastructure, including federated identity capabilities.
7. Build upon the Massachusetts Green High Performance Computing Center to provide sustainable, shared research computing and storage infrastructure to BU researchers.
   a. Forge and support shared infrastructure and research between BU's Charles River and Medical campuses.
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8. Provide robust, secure, user-friendly research administration data access and analytics, enhancing faculty ability to manage their sponsored programs.
9. Provide secure data repositories and user-friendly analytical tools to access academic information, from official academic records to course participation information, in support of teaching effectiveness, student retention and graduation, and pedagogical research.
10. In partnership with BU Libraries, support the data lifecycle, including the capability to securely store, protect, share, publish, archive, and expire/retire research, academic, and administrative data in accordance with applicable policies and data management plans.
11. Join peer institutions and industry in developing safe ways to leverage cloud infrastructure for research, including high performance computing and big data.

Assessment

We will develop a balanced scorecard-style dashboard to track our progress, including the following four quadrants:

Projects

- The number of projects in progress in each strategic capability area, by status

Community Satisfaction

- Bi-annual TechQual+ results and monthly ticket resolution survey responses

Service Portfolio Health

- Number of criticality 4 and 5 services with health less than 3

Cost

- Status of cost benchmarks relative to peers, such as central IT funding as % of institutional expenses, and IT funding per FTE

We will also continue to publish service level metrics for support overall, as well as specific service SLAs, at http://www.bu.edu/tech/about/service/metrics/

Appendices

Appendix A: Technology Service Portfolio Health Charts

See following slides
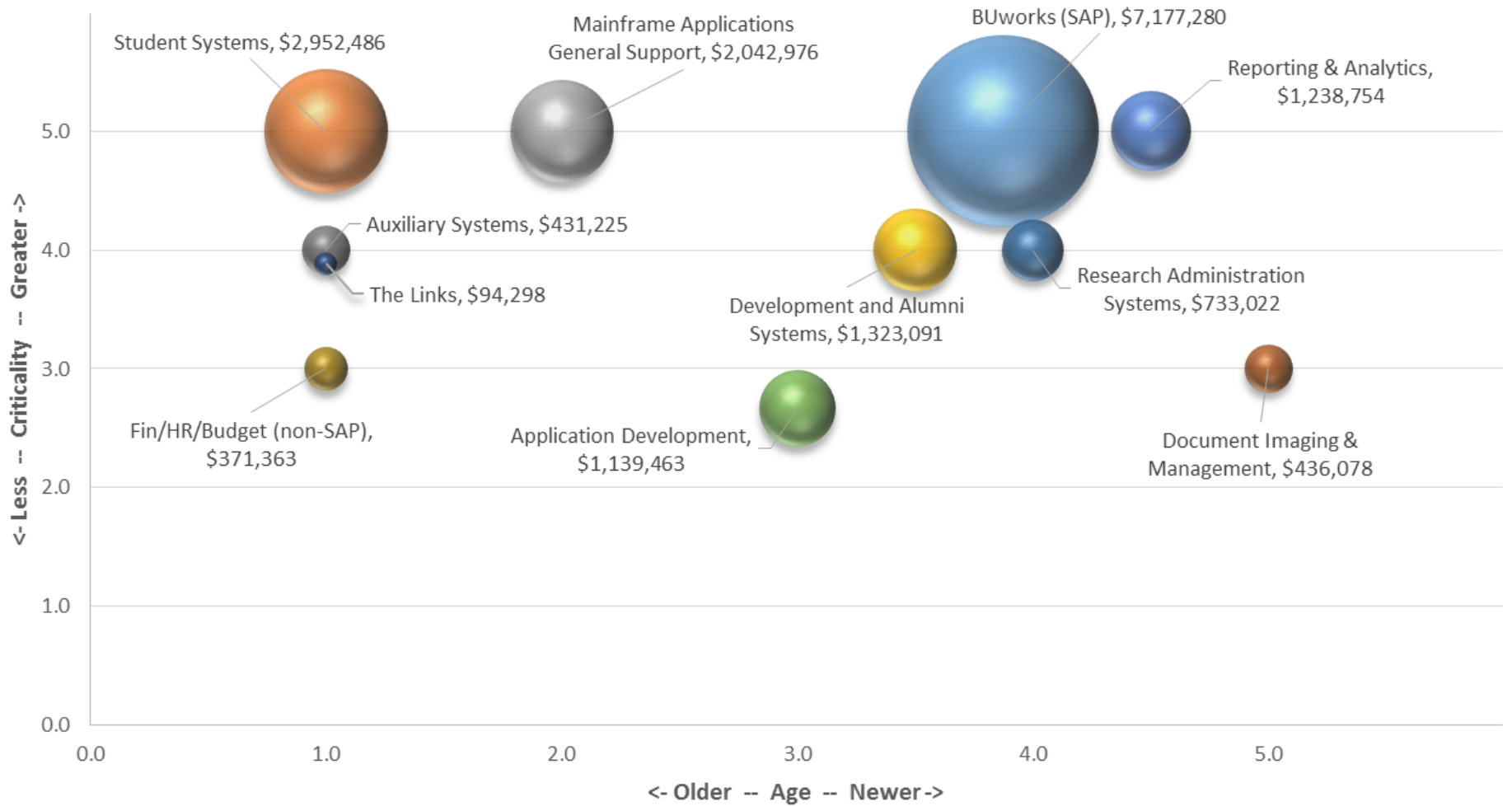
Key to Criticality and Age Values

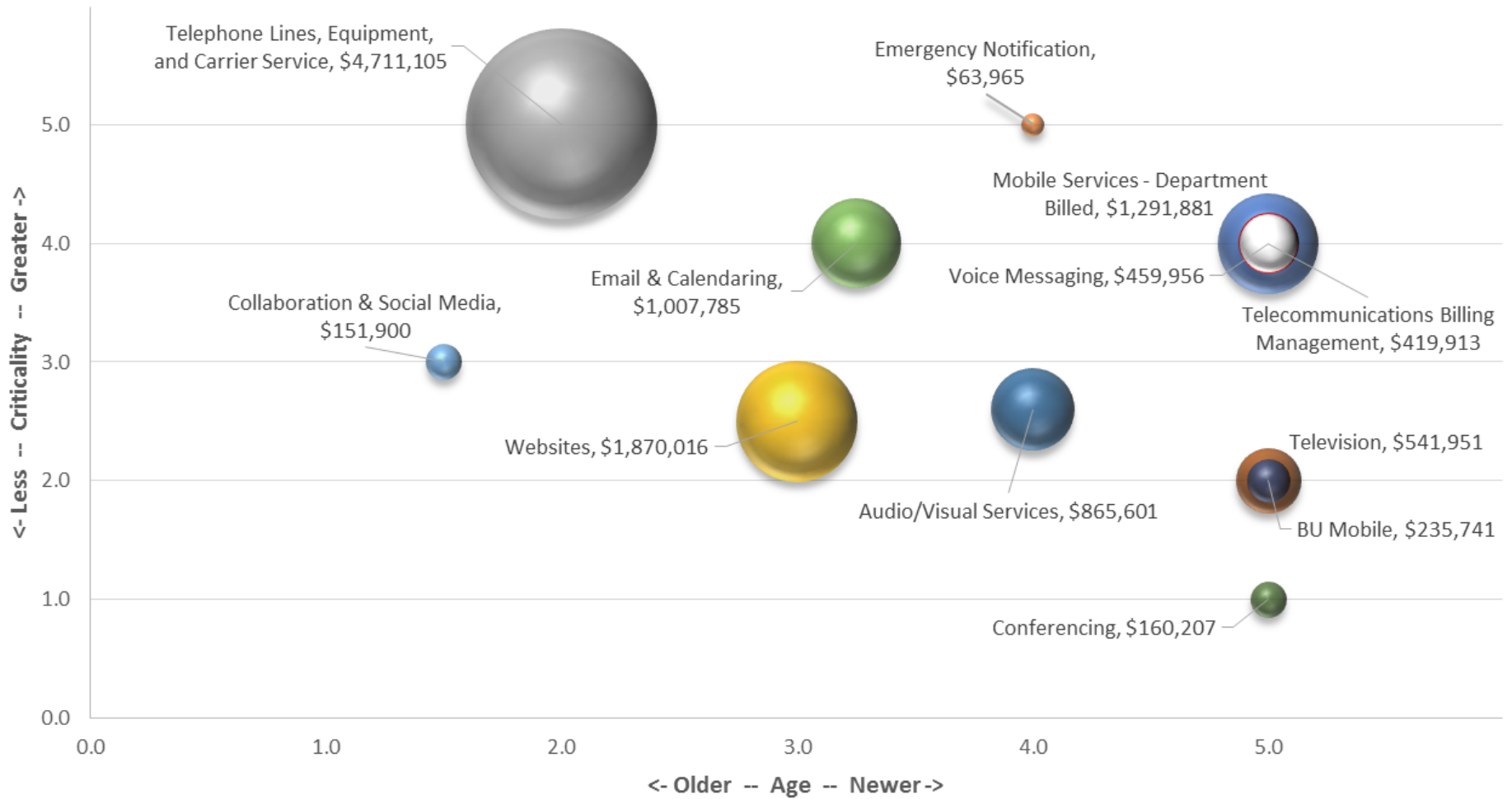| Criticality	
5	Life safety or compliance requirement
4	Required for continuation of learning or service activities for all or many clients
3	Required for continuation of learning or service activities for some clients
2	Enhances quality of learning or service activities for all or many clients
1	Enhances quality of learning or service activities for some clients

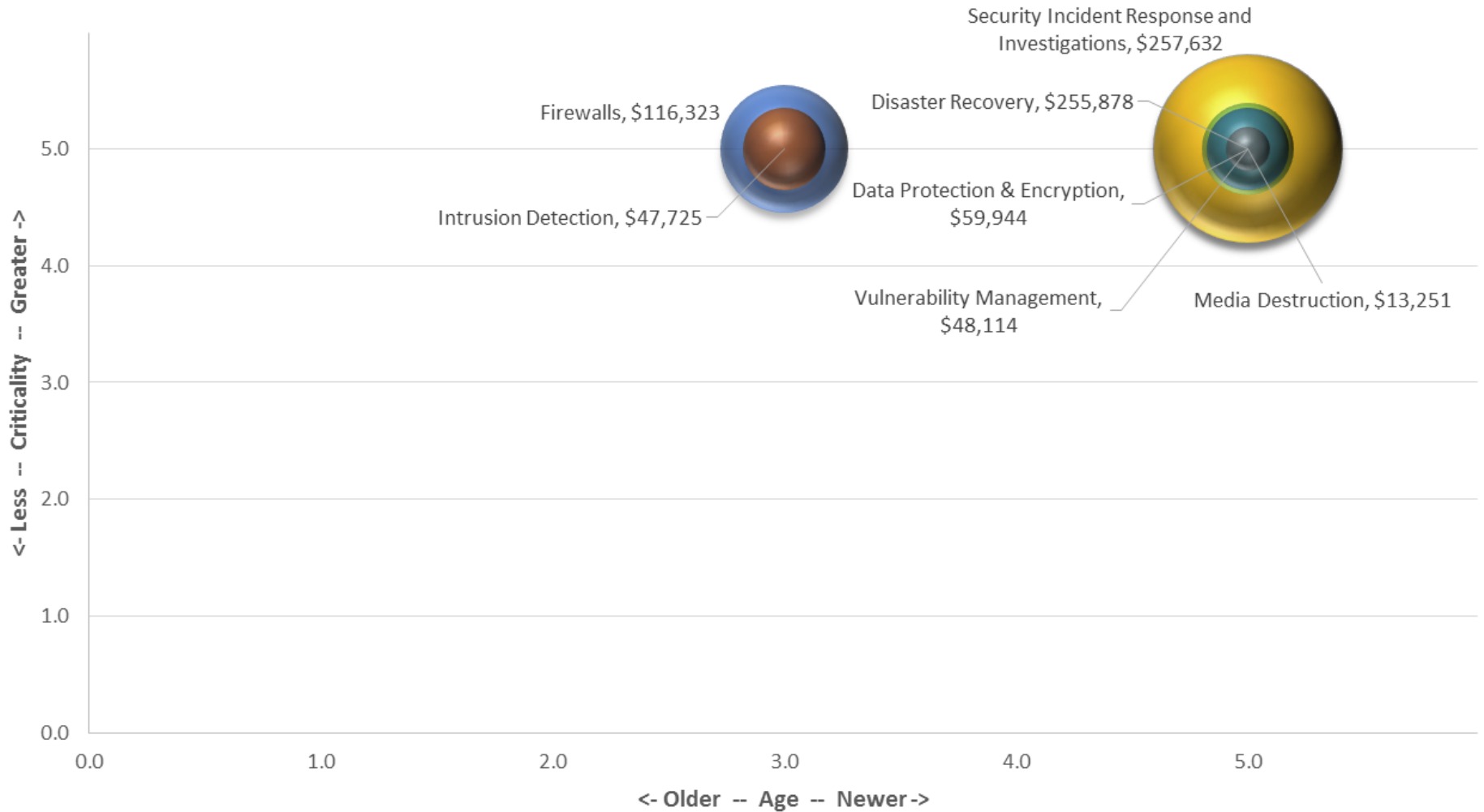| Age	
5	New
4	Early in industry standard life cycle
3	Middle of industry standard life cycle
2	Near end of industry standard life cycle
1	End of life

BOSTON
UNIVERSITY

2

Administrative Systems & Reporting

Communication & Collaboration Systems

Telephone Lines, Equipment, and Carrier Service, $4,711,105

Emergency Notification, $63,965

Mobile Services - Department Billed, $1,291,881

Voice Messaging, $459,956

Email & Calendaring, $1,007,785

Telecommunications Billing Management, $419,913

Collaboration & Social Media, $151,900

Websites, $1,870,016

Television, $541,951

Audio/Visual Services, $865,601

BU Mobile, $235,741

Conferencing, $160,207

<- Less -- Criticality -- Greater ->

<- Older -- Age -- Newer ->

BOSTON UNIVERSITY

4

Information Security & Business Continuity

Security Incident Response and Investigations, $257,632

Firewalls, $116,323

Disaster Recovery, $255,878

Intrusion Detection, $47,725

Data Protection & Encryption, $59,944

Vulnerability Management, $48,114

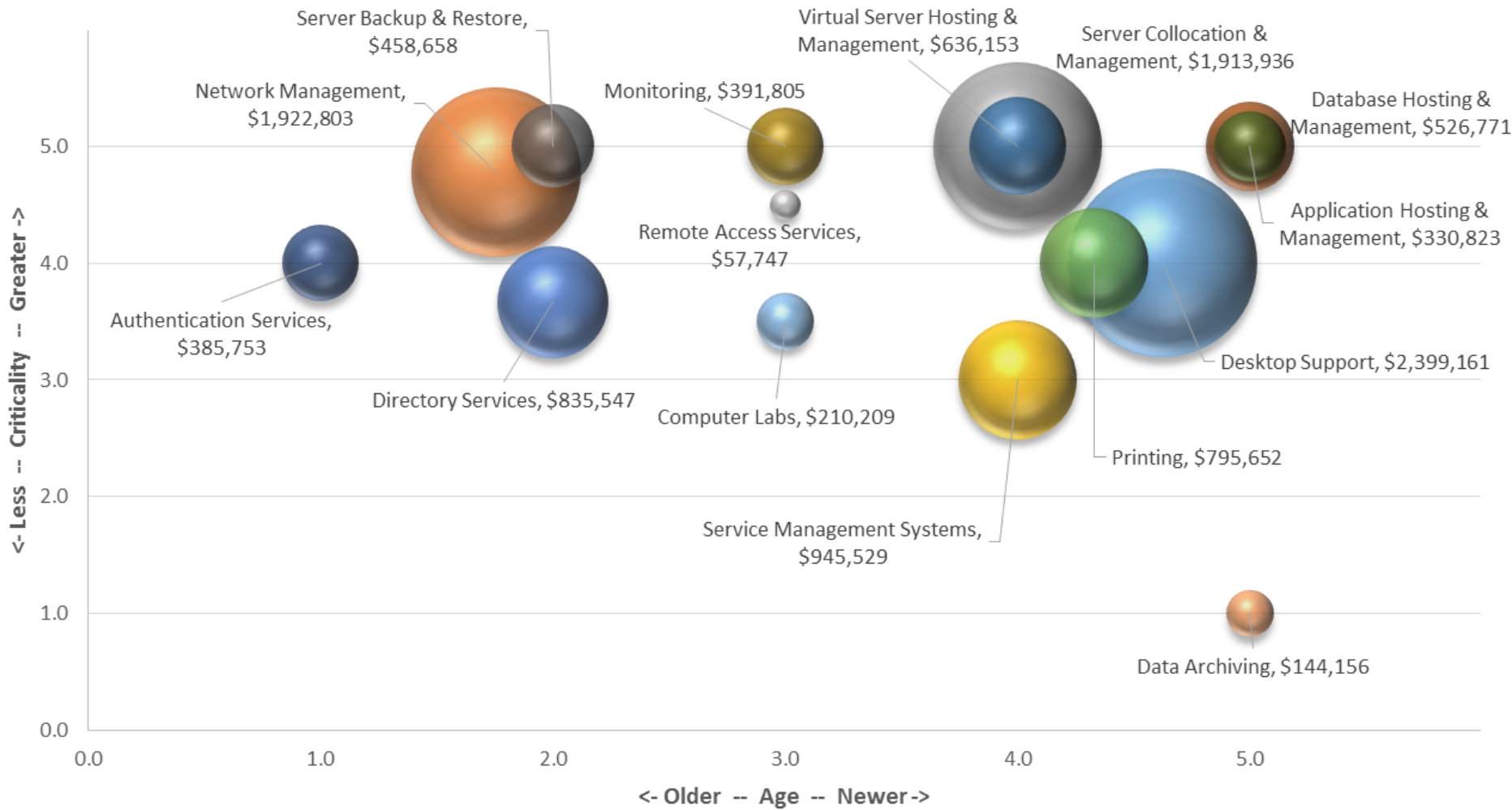Media Destruction, $13,251

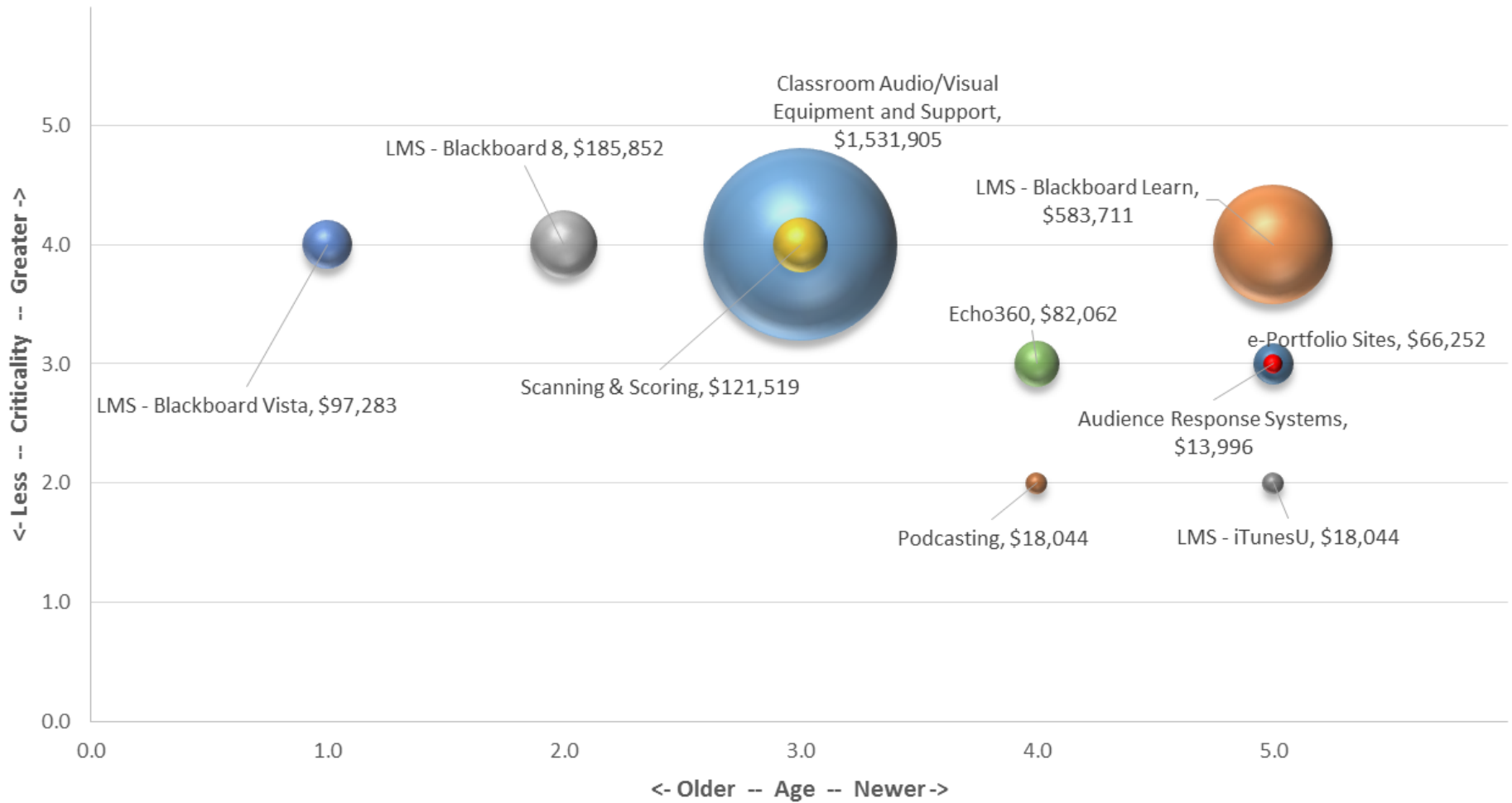<- Less -- Criticality -- Greater ->

<- Older -- Age -- Newer ->

Research Computing

Support & Infrastructure
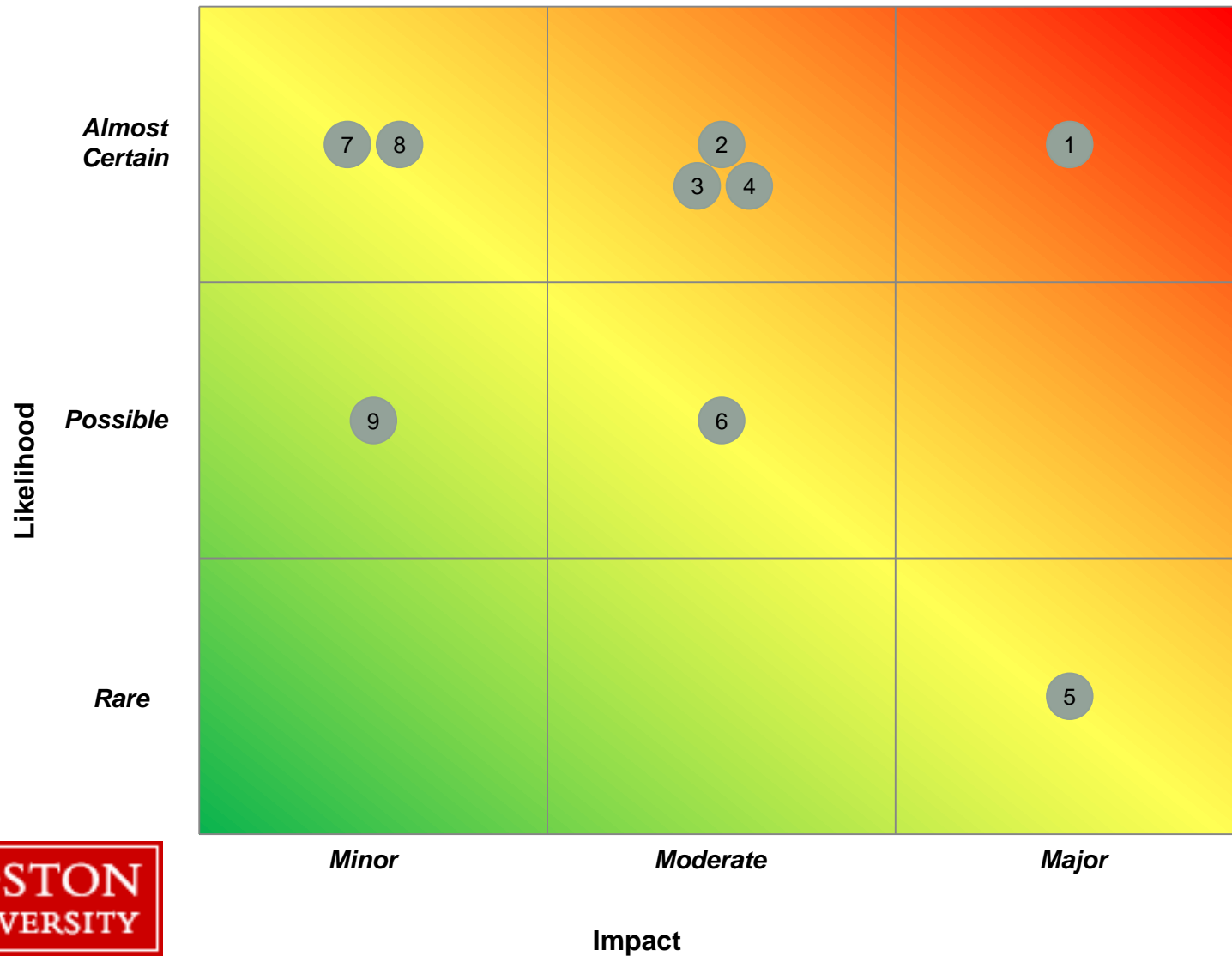
Teaching & Learning Technologies

Appendices

Appendix B: Enterprise Risk Management Technology Risks

See following chart and legend

Heat Map

Information Technology Risks & Risk Owners

#	Risk	Primary Type(s)	Owner
1	Failure to keep infrastructure and applications current	Operational Strategic	VP IS&T
2	Inability to attract/retain/train proper IT staff	Operational Strategic	VP IS&T
3	Faculty/staff underutilization or inexperience with University wide technology	Operational Financial Strategic	VP IS&T
4	Inability to provide accurate reporting to the university	Operational Financial	VP IS&T
5	Catastrophic system loss	Operational Financial Reputational	VP IS&T
6	Internal or External Breach of Restricted Use data	Financial Reputational	VP IS&T
7	Failure to maintain data integrity (financial/academic/research)	Operational Financial Reputational	VP IS&T VP Budget & Planning Senior VP Financial Affairs
8	Use of university networks or IT systems for malicious or illegal activity	Operational Reputational	VP IS&T
9	Failure to comply with information security and external regulations	Financial Reputational	VP IS&T

Appendix C: Initiative Alignment

Initiatives This table maps plan initiatives to the University-wide goals in Choosing to be Great.	Foundational	Faculty Quality	Interdisciplinary/ Interprofessional Programs	Undergrad Education	Residential Community & Student Experience	Grad Research & Education	Urban & Global
1. Expand collaboration between technology teams and organizations at BU who provide pedagogical, content, and instructional design to improve coordination, facilitation, and promotional capabilities.		x	x	x		x	
2. Ensure that learning platforms support anywhere, anytime use by a diverse, global community in a safe environment. Include support for mobile learning, rich media, voice and video communication, social networking, and emerging forms of assessment.		x		x	x	x	x
3. Provide quality classroom teaching environments for all courses, and experiment with and support the adoption of innovative classroom technologies.		x		x	x	x	
4. Provide secure repositories and user-friendly analytical tools to access academic information, from official records to course-specific information, in support of teaching effectiveness, student retention and graduation, and pedagogical research.		x		x		x	
5. Experiment with social networking technologies to develop online communities of practice in teaching, learning, and research.		x	x	x		x	x
6. Build upon the Massachusetts Green High Performance Computing Center to provide sustainable, shared research computing and storage infrastructure to BU researchers.		x				x	
7. Develop and implement a campus cyberinfrastructure plan to enhance BU research infrastructure, from the campus network to regional, national, and cloud-based computing resources.		x			x	x	x
8. Provide robust, secure, usable research administration tools to enhance sponsored program management by faculty.		x				x	
9. Support the lifecycle of research, academic, and administrative data in partnership with BU Libraries.		x				x	
10. Partner with Hariri Institute for Computing and Computational Science & Engineering to develop a dynamic, collaborative pool of human resources for the development and support of computational software for research.		x				x	
11. Support and leverage emerging "big data" tools to provide new analytical capabilities for research, teaching, and administration.						x	
12. Join peer institutions and industry in developing safe ways to leverage cloud infrastructure for research, including high performance computing and big data.						x	x
13. Enhance administrative systems to improve efficiency and capability, with a primary focus on research and academic administration.	x						
14. Ensure the ability to rapidly and securely provision new services by deploying industry standard Identity and Access Management (IAM).	x						
15. Expand the digitization of paper records and automation of manual workflows, including electronic signatures.		x					

(Continued on next page)

Initiatives (continued)

This table maps plan initiatives to the University-wide goals in Choosing to be Great.

	Foundational	Faculty Quality	Interdisciplinary/ Interprofessional Programs	Undergrad Education	Residential Community & Student Experience	Grad Research & Education	Urban & Global
16. Deploy a professional development system for faculty and administration that tracks the completion of required and elective training in areas such as security awareness, compliance, technical skills, pedagogical or research methodologies, and management.	x						
17. Expand adoption of IT service management best practices, including continued development and implementation of a shared service catalog, ITIL processes, and service management platform.				x		x	
18. Provide access to user-friendly tools in support of data-driven assessment with a focus on academic and administrative service quality.	x						
19. Develop an enterprise data dictionary and governance process in support of data sharing and distributed analysis.	x						
20. Provide support and training to empower faculty and staff to use data in strategic, tactical, and operational decision making.	x						x
21. Provide unified, high fidelity services that support one-to-one, one-to-many, or many-to-many communication and collaboration with integrated video, voice, messaging, scheduling, shared workspaces, and social networks.	x			x	x	x	
22. Reduce the risk associated with legacy applications by pursuing the replacement of central and local student information systems and developing a roadmap to transition other applications at risk for obsolescence.	x						
23. Develop a sustainable funding model and ongoing maintenance plan for the campus data network and core systems infrastructure.	x						
24. Strengthen controls over the systems and devices that host Restricted Use data, and educate users on proper handling.	x						
25. Implement an awareness program around the BU Data Protection Standards in partnership with BU academic experts.	x						
26. Provide solutions to allow people to easily secure their mobile devices in accordance with BU requirements.	x						