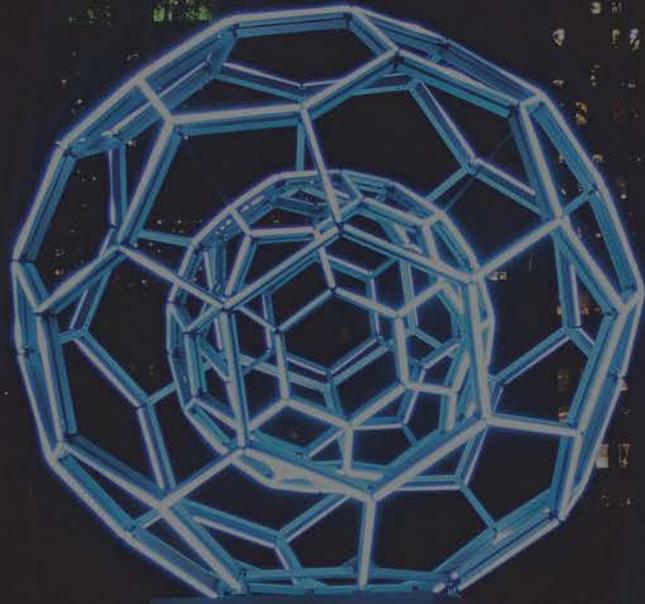# [Re] Imagining IT

Case Western Reserve University's
Information Technology Strategic Plan

Summer 2016

CASE WESTERN RESERVE
UNIVERSITY — EST. 1826

Credit: Photo by Victoria L. Valentine | Courtesy Arts Observer

Welcome Statement

Strategic planning is crucial for all organizations to set a clear direction, provide guidance to all stakeholders and offer a roadmap for the future. Between August 2015 and May 2016, dozens of individuals from across the university participated in a collaborative effort to understand current needs and identify emerging priorities.

Through engagement with the university community, Case Western Reserve's Information Technology unit has gained invaluable insight regarding existing perceptions, ongoing expectations and shared aspirations for how IT services can help advance the university's mission. Using this feedback and studying global trends, we have developed a plan that sets priorities, focuses energy and resources and provides direction for a changing, more centralized environment.

Welcome to *[Re] Imagining IT*, Case Western Reserve University's Information Technology Strategic Plan.

Table of Contents

Case Western Reserve University's Information Technology Strategic Plan

Letter from the President

To the Case Western Reserve University Community:

All of us appreciate the importance of technology in our lives- from helping us organize our schedules, to entertaining us, and, of course, enabling us to do our work more efficiently and effectively. We have come to realize that technology affects almost all of what we do, and never more so than when internet connections falter or our data is compromised.

[Re] Imagining IT is a strategic plan that embraces what Information Technology is, can and should be at Case Western Reserve. Through months of engagement with people across the campus, the planning group learned firsthand the aspirations, frustrations and essential expectations our community has for technology at this university. Rather than focus solely on the future's most exciting emerging IT opportunities, they recognized the importance of addressing basic functions as well.

As a result, this plan outlines an extraordinary ambition: to meet the myriad and disparate needs of the entire campus. *[Re] Imagining IT* incorporates feedback and recommendations heard during its development: IT aims to improve direct service on the campus; simplify use of technology of all kinds; and enhance the ways that technology contributes to education, scholarship and research.

Work on this plan started before the university began its centralization of IT late in 2015. Even so, this significant organizational change informed many of the details of this document and is discussed specifically in two of its sections. Centralization clearly is a key element in the plan's execution, and with the challenges and opportunities to come, it is also critical to the entire university. I thank everyone involved in the centralization process to date, and commend all of the faculty, staff and students who took part in creating this strategic plan. Not only do both efforts provide strong foundations for Case Western Reserve's future IT efforts - they also show great potential to accelerate the university's progress.

Barbara R. Snyder
President

Letter from the Chief Information Officer

To the Case Western Reserve University Community:

Great universities require great information technology. Our goal within IT is to provide the scholars and staff on our university the tools and services they need to perform their extraordinary work. Whether people are registering for a class, utilizing the high-performance computing cluster or developing applications for the Microsoft HoloLens to be deployed in an interactive classroom, information technology plays an integral role in nearly every university activity. Now, we have a plan to advance our technology environment and services.

For almost a year, our strategic planning team listened, read, debated and ultimately developed *[Re] Imagining IT*: Case Western Reserve University's Strategic Plan for Information Technology.

The plan outlines:

- Opportunities to catapult innovation in specialized areas of research and education;
- Areas where Case Western Reserve has a unique opportunity to lead;
- Recommendations involving technology that can help advance the university's mission;
- Action items to mobilize implementation.

The collaborative and inclusive process of developing the plan encouraged all members of the CWRU community to participate. From town halls and ice cream socials to anonymous and named online responses, collective input shaped every element of this plan. Once the strategic planning team completed a draft, they shared it with a group of faculty, staff, students and university IT colleagues for comments and suggestions. This final version reflects extensive consultation and deliberation, and is far better as a result.

I deeply appreciate the work of Steven A. Hauck, II, PhD, and Jess Shoop, leaders of this monumental effort. They spent countless hours gathering information on national trends, attending meetings, conducting a university-wide listening tour, drafting and revising this plan. I also extend a special note of gratitude to the Critical Review Team, named within the acknowledgements, who helped ensure the university's voice was represented within this plan. In addition, I thank all of the Deans, Chairs, administrators and student organization members for vetting many ideas and leading their units' contributions to *[Re] Imagining IT*. Finally, I must recognize our entire IT team - thank you for your enduring work to date and in the coming months of implementation.

In the midst of this collaborative effort of collecting the plan input from the university, the Office of the President announced a new direction for all IT at CWRU. This strategic shift is now a crucial element of *[Re] Imagining IT*. This plan will inform the IT centralization process and help move Case Western Reserve University to the higher levels. These aspirations are within our reach and, in the years ahead, we will turn them into reality.

With great optimism and much appreciation,

Sue B. Workman

Executive Summary Introduction + The Strategic Goals

Information Technology impacts virtually every person at Case Western Reserve. *[Re] Imagining IT* shows how enhanced technology and related services will support excellence in education and research across all disciplines. A strong focus of improving IT experiences for the entire Case Western Reserve University community is woven throughout the entire plan. Furthermore, it advances our progress towards key initiatives that support the university's mission and strategic plan.

The plan includes collaborative outreach to Case Western Reserve's outstanding partners within University Circle, across greater Cleveland and around the globe. It is a multi-year, results-oriented roadmap, intended to be innovative, realistic and relevant to all facets of Case Western Reserve University. Our goal is to provide direction for years to come. It aims to achieve greater efficiencies in the use of IT resources at a time when fiscal prudence is essential. Our resources will be directed toward the university's primary goals, as well as support constituents' overall efforts in education and research.

The Strategic Goals

The foundation of *[Re] Imagining IT* is comprised of three interconnected, overarching goals. Rooted in the voice of the campus, these goals are central to the ability of IT to enable the university's mission.

Address Fundamental Elements: We will provide strong, basic IT services and infrastructure essential to support the CWRU community.

Break Down Barriers: We will answer our university community's strongly expressed desires for simplicity, agility and clarity in their everyday technology experiences to improve their engagement with information and each other.

Advance Innovation: Case Western Reserve University needs to further its position as a global leader in scholarly achievement, leading-edge research and compelling learning experiences.

Strategic Initiatives + Recommendations

The Strategic Initiatives

The [Re] Imagining IT efforts will be guided by nine initiatives, informed by the campus community, to align the necessary recommendations and subsequent action items. There is not an order of priority among these efforts, as all are equally critical to the success and delivery of the IT Strategic Plan.

Initiative I: Support Student Success and Enhance the Student Experience

Recommendations: Provide Productive, Collaborative Workspaces - Empower Personalized and Lifelong Learning - Provide a Top-Quality Learning and Living Environment for Students

Initiative II: Facilitate Effective and Innovative Teaching and Learning

Recommendations: Support Engaging, Effective and Innovative Teaching and Learning - Provide Effective, Learning Environments

Initiative III: Enhance Research, Scholarship, Creative Activity and Academic Innovation

Recommendations: Develop and Maintain High-Performance Cyberinfrastructure and Research Tools - Engage in Substantive Collaboration on Research Funding and Engagement - Establish Virtual Research Commons - Support the Preservation and Curation of Research Data

Initiative IV: Strengthen IT Foundations, Infrastructure, Operations and User Experiences

Recommendations: Improve Awareness of IT Services, Products and Tools - Support a Culture of Service Excellence - Improve Access to CWRU Resources Anywhere, Anytime - Provide Needed Information Technology Tools - Make the Basic Tools and Facilities for Collaboration More Robust and Accessible - Provide Systems for Collaboration and Communications - Enhance Applications Focusing on the End-User Experience

Initiative V: Manage Information Security, Regulatory Compliance and Technology-Focused Business Continuity and Disaster Recovery

Recommendations: Identify, Assess and Manage Security Risks - Protect and Ensure the Continuity of the Institution in the Event of Disaster - Promote and Implement Security-Focused Policies and Practices and Secure the IT Infrastructure

Initiative VI: Support and Expand the Use of Institutional Data in Decision-Making

Recommendations: Improve Access to Information and the Collection, Care and Availability of Data - Infuse Data Analytics into Decision-Making - Improve Business Processes for Managing Content

Initiative VII: Investing and Funding Information Technology Strategically

Recommendation: Develop a Strategic and Sustainable IT Funding Model

Initiative VIII: Attract, Retain and Empower Technology Team Members

Recommendation: Attract and Retain Highly Effective IT Personnel

Initiative IX: Centralize University-Wide IT Services and Resources

Recommendations: Reduce and Effectively Manage the Information Security Risk Profile of CWRU - Ensure Business Continuity and Disaster Recovery Readiness by Leveraging Best Practices Across the University - Improve the IT Experience Across All Areas of the University - Optimize the University's Investments in IT - Foster Professional Growth and Development

The Journey

Steven A. Hauck, II, PhD, (Professor of Earth, Environmental and Planetary Sciences) and Jess Shoop (Senior Project Director, UTech) graciously agreed to lead the process of listening to the community, identifying common concerns and aspirations and developing information that responded to constituents' comments as well as emerging global themes in technology.

Beginning in August of last year, Hauck, Shoop and other planning team members participated in more than 60 meetings, forums and gatherings across the university, as well as large numbers of one-on-one conversations. The group also gathered information from an online survey distributed across the university. More than 1,600 individuals provided responses, giving the team quantitative and qualitative feedback.

Additional external guidance was gained from two independent information security reviews performed in 2015. ITS retained a team of higher education information security leaders from the Research and Education Networking Information Sharing and Analysis Center (REN-ISAC[1]). REN-ISAC performed a peer-perspective security program assessment in early 2015. The second, external benchmarking assessment of cybersecurity processes and risks was performed by the university's external auditors, Deloitte, in August 2015. Key findings of both assessments are incorporated into this plan.

From all of this input, the plan started to take shape. With the help of an independent consultant, Brian D. Voss, a first draft of the plan was generated. The draft was then sent to an independent internal Critical Review Team of CWRU students, faculty and staff. This team's input was invaluable and instrumental in the development of the working plan. The team members are acknowledged in the back appendix.

[1] The REN-ISAC mission is to aid and promote cybersecurity operational protection and response within the research and higher education (R&E) communities., www.ren-isac.net

The Role of Centralization

In light of rapidly expanding information security threats and enormous opportunities to enhance all aspects of technology on campus, Case Western Reserve launched a university-wide IT Centralization process in December of 2015. This initiative began with university-wide units - for example, the Division of Student Affairs - even as IT leadership conducted multiple gatherings to inform stakeholders directly about the effort and answer early questions. From there this process will begin to extend to each of the schools, with an ultimate goal of completing the mechanics of the transition within fiscal year 2017.

While this shift is not an initiative emerging from the strategic plan, its perceived and actual magnitude is such that it merits some discussion within this document.

The following guiding principles will help maintain focus on the initiative at hand.

Guiding Principle #1 – Moving to a Culture of "We"

One of the catalysts for Centralization was recognition that in pulling together the enormous and diverse talents of those who work in technology across the university, both those individuals and the university they serve would benefit. While the vast majority of individuals will continue to work in and/or for the same units or schools, they also will be part of the university's larger IT organization. Changing structural and reporting lines is a first step, but the most important one is to forge the robust spirit of a truly unified team. Such a sense does not come from an organizational chart, but an authentic and collective effort to share ideas, experiences and opportunities with one another. In this model, all members appreciate their value to their individual unit and the larger organization, and in turn see their contributions recognized across their own areas and the larger IT community.

Guiding Principle #2 – Honoring What Is and Has Been

The purpose of Centralization is to enhance and improve existing services and functions. Achieving those goals requires two distinct steps: understanding what has existed and why and identifying how to preserve the best of the past even as we create a new, even more ambitious IT division.

Guiding Principle #3 – A New Destination

Centralization must involve more than changing reporting lines if it is to realize its immense potential. The fundamental ideal is to build a new organization where the whole truly is greater than the sum of its individual parts. What that future state looks like will depend largely on those who are part of this new IT organization: what they bring to the new setting, what they gain and learn from it and how they all identify additional ways to serve their immediate stakeholders, as well as benefit the university at large.

Vision, Mission + Core Values

Each element of the strategic plan is guided by IT's mission, vision and organizational core values.

Mission - We support and enhance the academic and research mission of Case Western Reserve University through responsive service, enabling infrastructure, effective administrative systems and innovative solutions.

Vision - To be a preeminent organization that empowers CWRU's transformational teaching, learning and research.

Core Values

Adaptability - We are committed to remaining flexible and responsive to change. We value the input from all global sectors that employ IT, higher education colleagues and those across our own university. We execute on existing and new initiatives with a focus on excellence in assisting university constituents with teaching, learning and discovery.

Service Excellence - Serving students, faculty and staff is our reason for existing. We continually seek to understand the needs of those who depend on us and strive to exceed their expectations.

Collaboration - We work in a collaborative, cooperative, team-driven environment that encourages both individual and shared excellence in striving to achieve our goals. We value the mutual respect that true teamwork entails.

Innovation - We thrive in a culture that is dynamic. We seek, develop and test new ideas to advance the university. Because there is often no one right answer to a question, we rely on experimentation to drive many efforts in search of solutions and continuous improvement.

Integrity - We revere honesty and adhere to the highest ethical standards in our daily work. We strive for transparency in our operations.
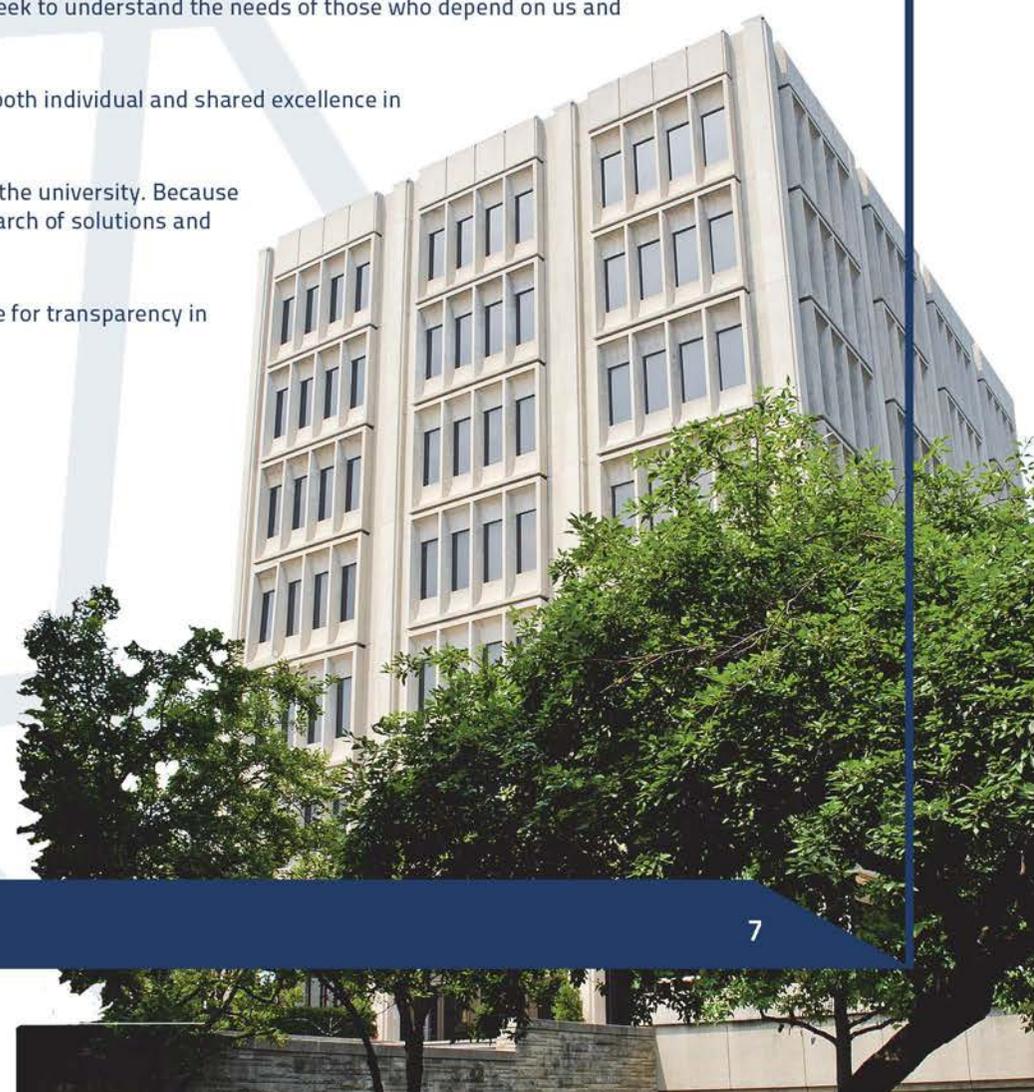
Overview – Strategic Goals

The plan is organized by strategic goals and initiatives, recommendations and action items. All action items will align within one or more of this plan's goals: **Address Fundamental Elements, Break Down Barriers or Advance Innovation**. The goals will serve as guide posts for tracking the progress of the plan. Each action item will be assigned to an owner or group of owners that will create an implementation plan. The timing of that implementation will depend on many variables, such as university strategic initiatives, available funding, available staff, technology readiness, climate preparation and community feedback.

Address Fundamental Elements: For CWRU to be successful, it is crucial for the institution to have strong basic services and infrastructure. These fundamental elements include a continual process of seeking opportunities to maintain and modernize existing infrastructure and services. We will provide the strong basic IT services and infrastructure essential to support the Case Western Reserve community.

Break Down Barriers: The CWRU community has expressed a strong desire for simplicity, agility and clarity in everyday technology experiences. IT will focus on improving the ability for individuals to connect, streamlining the flow of information, increasing data sharing, enhancing data analysis and providing reliable technology. We will answer our university community's strongly expressed desires for simplicity, agility and clarity in their everyday technology experiences to improve their engagement with information and each other.

Advance Innovation: Innovation will help position CWRU as a university that enables scholarly achievement, exploration and entrepreneurship resulting from discovery and the expansion of knowledge through the use of information technology. Case Western Reserve University needs to further its position as a global leader in scholarly achievement, leading-edge research and compelling learning experiences.

Strategic Initiatives, Recommendations + Action Items

Initiative I: Support Student Success and Enhance the Student Experience

Information technology is pervasive in the lives of nearly all members of the CWRU community, and especially of students. Young people are accustomed to constant connection - with one another, their studies and their play. In this context, students have high expectations of both the ubiquity of technology on campus and its continuous accessibility.

Recommendation 1 - Provide Productive Collaborative Workspaces

CWRU has invested heavily in providing computing devices for student use in classrooms, labs and other locations. Even though almost all students own computers and mobile devices, students still draw value from university facilities housing technology and devices. Many find these fixed locations appealing because their ease of use or special purpose software. As technology is constantly changing, fixed locations may become virtual.

Action Item 1.1: Conduct a biennial, collaborative and inclusive analysis of the value of student technology workspaces.

Action Item 1.2: Assess and review the technology capabilities within physical collaborative spaces available to the students, with the intent of promoting a productive work space environment to help students work together or individually.

Recommendation 2 - Empower Personalized and Lifelong Learning

Personalized learning facilitates the academic success of each student by first determining individual learning needs, interests and aspirations and then providing customized learning experiences. Beyond the traditional campus and post-secondary period, opportunities exist to engage people in a life-long learning process.

Action Item 2.1: Simplify and improve access to information about academic preparation, success factors and progress for students, faculty and other advisors.

Action Item 2.2: Create resources for students to learn technologies commonly used in careers and in research endeavors. Such opportunities can help students to increase their potential for success as students and upon graduation.

Action Item 2.3: Provide students the opportunity to gain meaningful experiences in applying their skills to university IT projects.

Recommendation 3 – Provide a Top-Quality Learning and Living Environment for Students

CWRU should ensure that incoming students find IT performance and capabilities equal to or better than from their homes or previous scholastic environments.

Action Item 3.1: Through research and informal surveys, improve IT's understanding of the educational, research and extracurricular technology needs of students, both now and for the future, and ensure that the technologies and services offered are appropriate and supported adequately.

Action Item 3.2: Collaborate with Residence Life and Student Services to ensure that students who reside on campus have the technology they need to assist them with scholarly activities.

Action Item 3.3: Create a "one-stop" digital location for students to get information, help and support for their use of common university services and resources.

Strategic Initiatives, Recommendations + Action Items

Initiative II: Facilitate Effective and Innovative Teaching and Learning

Throughout the information-gathering process for this plan, stakeholders emphasized the importance of improving the reliability, ease-of-use and support of IT on campus- in particular technology used in teaching in learning. For example, many faculty and students asked that IT find ways to simplify technology's use in classrooms. Constituents also urged IT to concentrate on enhancing existing operations, rather than focus solely on acquiring and implementing new- cutting-edge projects.

Recommendation 4 – Support Engaging, Effective and Innovative Teaching and Learning

For IT to support effective and innovative teaching, we must develop and support an ongoing strategy to assist faculty in providing engaging and effective learning environments. This strategy will include the adoption of emerging technologies and the related challenges associated with new approaches, such as intellectual property rights.

Action Item 4.1: Develop and execute a consistent strategy for creating, implementing and supporting innovative learning inside and outside of physical learning spaces, including open, blended and online learning. Each initiative should represent the high-quality experience expected from CWRU.

Action Item 4.2: Work collaboratively with faculty to support and encourage adoption of new ways of teaching and learning using IT tools. Potential examples may include Microsoft HoloLens, high-quality blended and online, local and international learning experiences and assistance for faculty who want to help students learn about ways to harness data to identify issues and opportunities within systems and organizations.

Action Item 4.3: Collaborate with university partners (faculty, University Center for Innovation in Teaching and Education (UCITE), Kelvin Smith Library, Seminar Approach to General Education and Scholarship (SAGES) and the Writing Center) to create a robust program that provides faculty timely and comprehensive opportunities to learn more about existing and emerging educational technologies and how to use them with students.

Action Item 4.4: Grow IT's capacity to assist faculty with the creation of instructional learning resources for classroom, online, virtual and blended learning environments. These efforts also address the needs of differently abled learners.

Action Item 4.5: Collaborate with university partners to develop an action plan to address the need for enhanced digital content, such as video streaming and capture, 3D and 4D image capture, processing, adequate storage and technology sandboxes for student learning and experimentation.

Action Item 4.6: Work collaboratively with the university community to update CWRU's intellectual property policies regarding faculty and university ownership of multimedia assets created by faculty with the assistance of university staff and/or using university resources. This policy will include learning materials accessed online such as videos and interactive modules.

Action Item 4.7: Assist the Office of the Provost with the assessment of the market for online education and the development of a plan to coordinate online learning development, delivery and support. This includes regulations such as state authorization and supporting the individual schools and Faculty Senate committees as they guide the development of online curricula.

Strategic Initiatives, Recommendations + Action Items

Recommendation 5 – Provide Effective Learning Environments

IT at CWRU needs to develop a strategy for the provision of physical learning spaces that addresses the rapidly evolving nature of teaching and learning - as well as expressed desires for more user-friendly and reliable technology within classrooms.

Action Item 5.1: Regularly assess the effectiveness, usage, usability and user experience of the infrastructure and technology in all learning environments to provide a high-quality learning and user experience.

Action Item 5.2: Create and implement a process to ensure the regular maintenance and lifecycle replacement of technology infrastructure and tools in all learning environments. Engage in a university-wide assessment of classrooms to ensure current equipment and service is meeting instructional needs

Action Item 5.3: Consistently monitor learning spaces to ensure that the technology deployed is functional, stable and enhances faculty teaching and student learning.

Action Item 5.4: Assess the need for, and then provide an appropriate number of learning spaces with suitable video capture/broadcasting resources and advanced network connectivity. Provide support personnel to enable faculty to deliver education world-wide via virtual interaction.

Action Item 5.5: Create and regularly assess learning spaces and innovative technologies that maximize student engagement and learning, such as hands-on design, collaboration tools and holographic images. This is particularly important for new learning environments and strategies in the Health Education Campus, and as holographic teaching and research spreads on the campus.

Action Item 5.6: Develop a capital and operational funding strategy that supports all classrooms and learning environments across the institution.
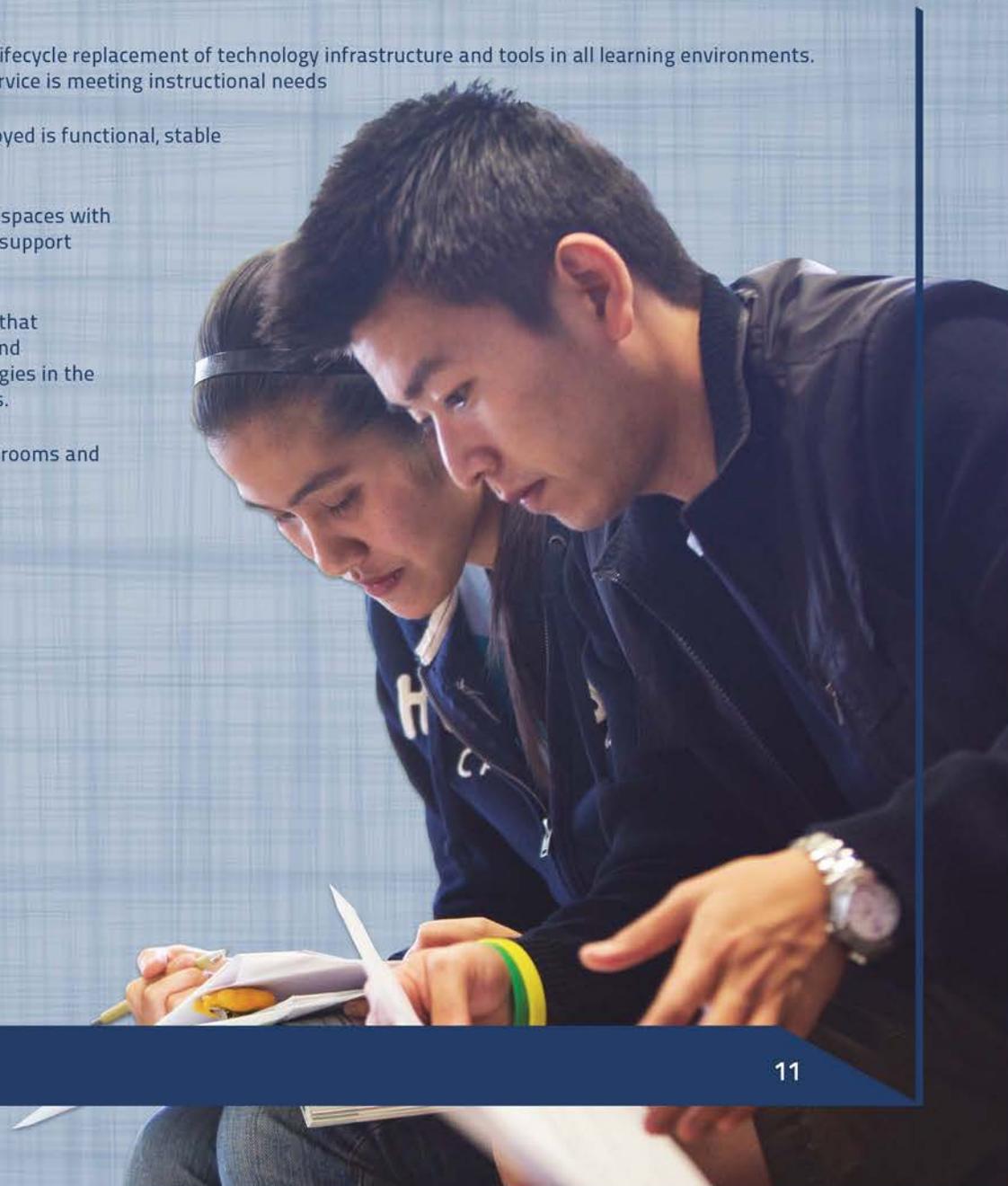
Strategic Initiatives, Recommendations + Action Items

Initiative III: Enhance Research, Scholarship, Creative Activity and Academic Innovation

As a research-intensive university, scholarly activity is critical to the university's success. Whether it is cyberinfrastructure, access to large and advanced data sets or technology tools supporting collaboration with colleagues across communities on and off campus, IT supports the research mission of CWRU. Discovery, creative activity and innovation are elements that take us all beyond what is possible today to what will be commonplace tomorrow.

CWRU researchers should have constant access to the processing, networks, storage, software, specialized equipment and "human capital" to support their efforts. To improve our research environment beyond the sciences, we need a centrally coordinated effort to help researchers discover untapped resources and support, especially in the arts, humanities, social sciences, law and music.

Recommendation 6 - Develop and Maintain High-Performance Cyberinfrastructure and Research Tools

High-performance computing (HPC) greatly contributes to the success of CWRU researchers. Through the work of the Advisory Committee on Research Computing (ACRC), which is composed of faculty from throughout the university, IT seeks to provide a holistic approach to the provision, advancement and support of HPC. Going forward, the broadest array of cyberinfrastructure components needs to be addressed continuously. These components are not limited to HPC but also include peta- and exa-scale data storage capability, giga- and tera-scale networking to facilitate data access and movement, advanced research software and personnel who are well-versed in both the needs of researchers and the offerings of technology. Researchers need ways to identify and understand the superset of tools and services used by the research community, and for the university (and IT) to develop a support model for those tools, including acquisition, funding, deploying and supporting their use.

Use of cyberinfrastructure, especially high-performance computing, in the social sciences, arts and humanities is growing. Establishing support mechanisms and seeking ways to expand the availability of cyberinfrastructure resources so they are accessible beyond the traditional scientific and medical users is a priority. The university should seek ways to expand the availability of cyberinfrastructure resources so that such resources are available for non-traditional users, and seek to establish support mechanisms that encourage and support adoption.

Action Item 6.1: Maintain and support highly reliable and quickly expandable cyberinfrastructure, including HPC, peta-scale storage and a high performance research network.

Action Item 6.2: Work to improve the use of massive-scale HPC, a high-speed network and research storage options, to a broader research community. Through collaborative design, strong network cyberinfrastructure and enhanced support mechanisms, CWRU will seek to extend the availability of federally funded supercomputer centers and other off-campus sources to our researchers.

Action Item 6.3: Explore new approaches to enhance how information technology is used beyond the sciences, engineering and medical research, in non-traditional, creative research areas such as the arts, humanities, social sciences, management, law and music.

Strategic Initiatives, Recommendations + Action Items

Action Item 6.4: Foster the growth and availability of technologies and support to assist researchers with data visualization and interaction.

Action Item 6.5: Develop a program to identify and provide advanced research software (like HPC and Data Visualization tools) and applications with the goal of giving access to a broader research and faculty community. These programs should look to expand the use of research tools to a broader university community by leveraging university-wide licensing models for improved research opportunities.

Recommendation 7 - Engage in Substantive Collaboration on Research Funding and Engagement

CWRU is a research-intensive university and external research funding is essential to its success. Increasingly, federal funding opportunities are targeted in areas having a strong technology and/or cyberinfrastructure component. IT should continue to strengthen its efforts to secure external funding for its cyberinfrastructure and in working collaboratively with faculty both pre- and post-award on externally funded research efforts.

Action Item 7.1: Collaborate with faculty on technology- and cyberinfrastructure-focused research funding efforts, such as the National Institute of Health (NIH) Shared Instrumentation Grants, the National Science Foundation (NSF) Major Research Instrumentation and opportunities from the NSF Office of Advanced Cyberinfrastructure. IT's involvement should be as Principal Investigator (PI), co-PI, senior personnel or as appropriate.

Action Item 7.2: Continue and expand the research computing staff embedding initiative in which these staff participate collaboratively in established research groups and centers. This expansion would facilitate more optimal use of CWRU cyberinfrastructure and helps to discover how IT can be more responsive and proactive to IT needs of researchers.

Action Item 7.3: Collaborate broadly with researchers and university organizational units to assess current and emerging challenges facing researchers and then develop services that address those needs.

Recommendation 8 - Establish Virtual Research Commons

Create a virtual space on campus for researchers where helpful information, tools and expert support are easily accessible. A new virtual research commons environment hopes to connect people with aligned interests- often helping each other implement or adopt ideas and tools from other disciplines into their own.

Action Item 8.1: Collaborate with the Kelvin Smith Library, the Office of Research and Technology Management and the research community to develop a virtual, interactive clearinghouse of information. This would enable collaboration and interdisciplinary research engagement, internally and externally.

Recommendation 9 - Support the Preservation and Curation of Research Data

The university must comply with existing regulations regarding the preservation and curation of research data, as well as identify existing and emerging best practices that extend beyond those rules. By continuing to support the improvement and enhancement of curation and data access and management, CWRU will be positively positioned within the global research community.

Action Item 9.1: Collaborate with university partners (the faculty, Kelvin Smith Library, the Office of Research and Technology Management and the academic units) to assess, design, implement and maintain a range of data management services to address requirements of funding entities and scholarly publishers and to facilitate open research initiatives.

Strategic Initiatives, Recommendations + Action Items

Initiative IV: Strengthen IT Foundations, Infrastructure, Operations and User Experiences

CWRU must continue to strengthen the foundational elements of our IT environment through service excellence and raising awareness of the IT resources available. In order to promote more innovative uses of technology, CWRU must ensure that the foundational technology works. The IT environment must also be kept up to date with the latest industry trends, such as virtualization, cloud technologies, video conferencing and more.

The IT environment at CWRU has many great features available – but knowing what they are and how they may be used can be a significant challenge. Ensuring that the university community knows what relevant IT innovations (new and old) are available to members of the university and how to fully take advantage of them must become standard practice.

Recommendation 10 - Improve Awareness of IT Services, Products and Tools

Enable the university to make the most effective use of university-provided IT resources by implementing programs that support familiarization, training and ongoing education. Various delivery methods such as step-by-step written instructions, in-person training and online materials should be utilized.

Action Item 10.1: Collaboratively develop, implement and support education and training programs for all university citizens that will provide opportunities to enhance their knowledge and understanding and to improve their needed skills to fully utilize the technology and services available to them. These programs will include training for new faculty, staff and students.

Action Item 10.2: Provide and publicize the availability of an easy-to-use, single resource for students, faculty and staff to identify, access and learn about available IT services.

Recommendation 11 – Support a Culture of Service Excellence

Providing exemplary service to the CWRU community is absolutely essential. Exemplary means ensuring systems are user friendly and available and members of the university community are treated with kindness and the utmost respect. When supporting the technology needs of the university community, IT must be more proactive instead of reactive and envision services through the lens of the customer. Monitoring systems, proactive maintenance to prevent failure, and make sure procedures are in place to bring systems back up efficiently and effectively when there is a system outage, are all built-in components of this service. Members of the university community possess different levels of technology skills. IT must support these diverse levels of technical skills and go beyond the expectations of the community.

Action Item 11.1: Ensure all systems are monitored and procedures are in place to restore systems that encounter problems. Implement fail-over systems and ensure systems are backed-up appropriately.

Action Item 11.2: Expand self-help tools, community-driven special interest groups, interactive/online support options and access to experienced IT professionals. Ensure these support tools and options accommodate all levels of technical skills.

Action Item 11.3: Create a support model that addresses the need for scalable, consistent and transparent support strategies that will serve the main campus and off-campus locations, such as the Siegel College, University Farm and beyond. This model will include support for CWRU's online learning programs.
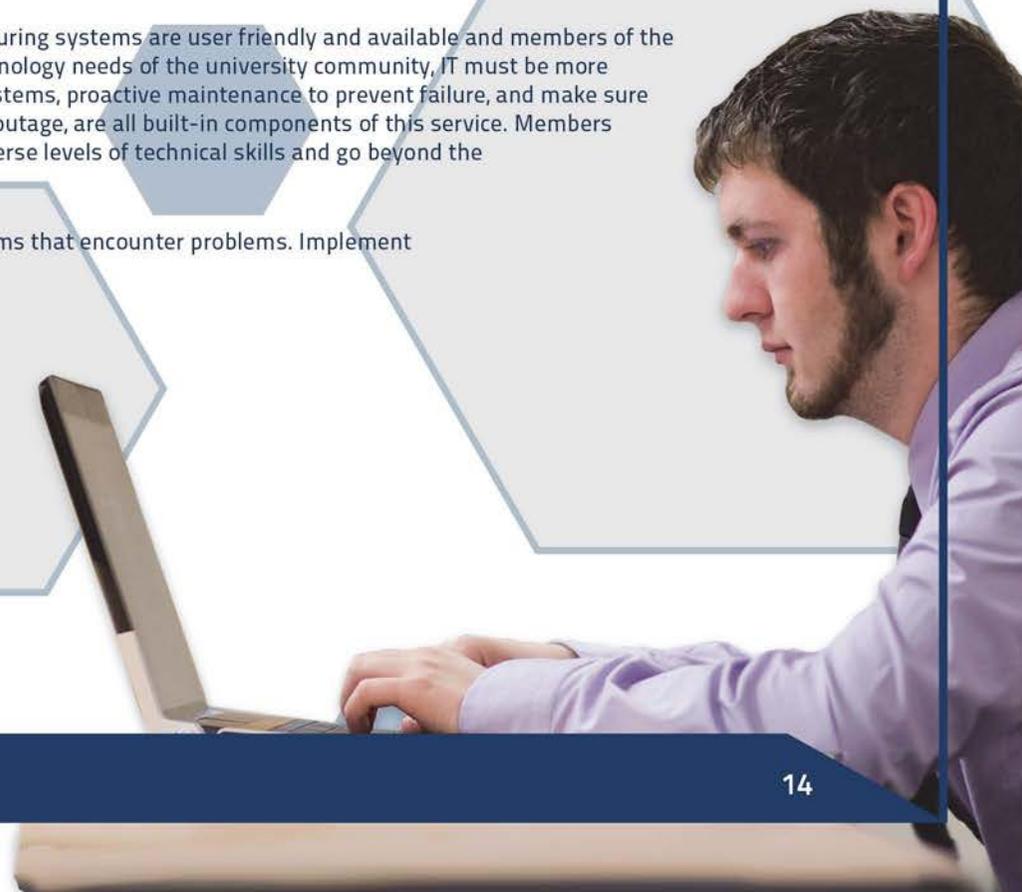
Strategic Initiatives, Recommendations + Action Items

Recommendation 12 – Improve Access to CWRU Resources Anywhere, Anytime

Being "connected" to the world is a baseline expectation. The members of CWRU community teach, learn, research and play on many different devices, often congruently. Network access of one form or another (wired, wireless, cell) is an essential part of the university infrastructure for classrooms, offices, study areas and labs.

The prevalence of small portable devices requires a responsive and versatile university network that embraces the ever-growing number of platforms being run on those devices.

These expectations are not limited to our physical campus. CWRU must consider the user experiences on all devices in a global context, including virtual presence. Researchers, teaching faculty, administrators, students and others continue to find the need to do the work of the university outside of its walls.

Action Item 12.1: Provide a secure, reliable, highly available and robust core network infrastructure to the university with enough bandwidth to serve the university community at peak hours.

Action Item 12.2: Ensure the entire CWRU community has secure access to university information and services from anywhere Internet access is available.

Action Item 12.3: Provide secure mobile experiences for key university systems, enabling users to securely conduct university enterprise activities from any device.

Action Item 12.4: Continue to evaluate, implement and support technologies that take advantage of modern cloud architectures such as Infrastructure as a Service, Platform as a Service and Software as a Service. These technologies will provide more robust, secure, reliable and highly available systems than what can be supported in our data centers today.

Action Item 12.5: Create a methodology to evaluate and select the best cloud architecture needed for each application and/or system including good fiscal stewardship, accessibility of data and ease-of-use. Ensure all implementation costs are identified and that staff members are trained to support these cloud architectures.

Strategic Initiatives, Recommendations + Action Items

Recommendation 13 – Provide Needed Information Technology Tools

New students, faculty and staff should experience excellence in IT orientation efforts, service and support. Nearly everyone owns multiple devices - desktop computers, laptops, tablets, smartphones, game consoles and more. IT at CWRU must continue to work to provide programs for group discounts for hardware and software and that useful distribution mechanisms for acquisition and installation are available and easy to use.

Action Item 13.1: Simplify the experience of ordering, purchasing and provisioning IT services in collaboration with Procurement. CWRU must leverage scale while being good stewards of university resources.

Action Item 13.2: Continuously develop and deliver programs and services that encourage and facilitate student access to IT devices and software. In a convenient manner, make possible the access of technologies at no cost or large discounts.

Action Item 13.3: Ensure that the purchasing, licensing, tracking and delivery of software are conducted as effectively and efficiently as possible by collaborating with the university community, including encouragement to use open source tools where appropriate.

Action Item 13.4: Develop a model that provides for flexibility in its approach in the types of technologies (hardware and software) deployed so CWRU can take advantage of the widest array of opportunities presented by the marketplace.

Action Item 13.5: Support the university's goals for sustainability by identifying and deploying technologies that promote more effective power management and lower operational energy use overall.

Recommendations 14 – Make the Basic Tools and Facilities for Collaboration More Robust and Accessible

Collaboration tools and spaces on campus are abundant, and will continue to grow as technology changes. IT will focus greater attention on the robustness of the available technological tools, including improving its basic elements (room scheduling and collaborative physical and electronic spaces). Ensure that these tools are accessible to accommodate special needs of members of the university community.

Action Item 14.1: Regularly review all collaboration tools (email, calendar, audio and video conferencing) to ensure the appropriate tools are available and supported.

Action Item 14.2: Review the room scheduling system with university partners to determine effectiveness and ease-of-use and, if necessary, garner the resources to replace or improve.

Action Item 14.3: Form partnerships throughout the university and assess the potential opportunity to develop physical and virtual spaces that support improved connection and collaboration within the CWRU community and beyond.

Action Item 14.4: Provide virtual collaborative meeting places to help CWRU connect with teams inside and outside the CWRU community. These meeting spaces could be enabled through online virtual meeting places that leverage video conferencing and real-time document and presentation sharing.

Action Item 14.5: Together with university partners, collaboratively develop and implement standards for ensuring accessibility to IT resources to accommodate the special needs of members of the university community

Strategic Initiatives, Recommendations + Action Items

Recommendation 15 - Provide Systems for Collaboration and Communications

Unified communication systems allow faculty, staff and students the ability to transition seamlessly among all accessible communication devices. With a click of the mouse, a person can move from an instant messaging exchange to a video conference call or a traditional telephone call. CWRU needs to continue investing in cost-effective systems with high-definition video, high-quality displays and high-fidelity audio that create a sense of presence and realism for group conferencing. Availability of such systems in university workspaces can increase the productivity and effectiveness of collaborative work.

Action Item 15.1: Continue to evaluate, provide and support technologies that promote seamless communication and effective collaboration within and beyond the CWRU campus and extended environment.

Action Item 15.2: Provide a reliable, widely available, simple to use, collaborative infrastructure that supports both high-quality as well as self-service video and audio conferencing.

Action Item 15.3: Provide reliable, high-quality, live streaming for key events, symposiums and sporting events at a reasonable cost; provide on-demand streaming for viewing at later dates and times.

Recommendation 16 – Enhance Applications Focusing on the End-User Experience

Applications used across the university should be intuitive. Ease-of-use is a positive incentive that encourage university members to work within the integrated information environment instead of developing isolated outside systems to accomplish a task. Most of the knowledge required to operate one system will be similar to others. Training is kept to a minimum, and the risk of using a system improperly is low.

Action Item 16.1: Continually improve the functionality of enterprise applications with an eye to the enriched user experience and elimination of shadow systems.

Action Item 16.2: In collaboration with the university community, create and implement consistent business processes and practices by consolidating redundant applications found across the university.

Action Item 16.3: Ensure enterprise applications are fully integrated. Data should not need to be entered multiple times. These applications should be so seamless that end-users do not need to know which application they are using.

Action Item 16.4: Applications will be required to have a common look and feel and support ergonomic requirements. Hence, the "common look and feel" standard must be designed and usability test criteria must be developed.

Action Item 16.5: Develop guidelines for user interfaces that should not be constrained by narrow assumptions about user location, language, systems training or physical capability. Factors such as linguistics, customer physical infirmities (visual acuity, ability to use keyboard/mouse) and proficiency in the use of technology have broad ramifications in determining the ease-of-use of an application.

Strategic Initiatives, Recommendations + Action Items

Initiative V: Manage Information Security, Regulatory Compliance and Technology-Focused Business Continuity and Disaster Recovery

Protecting the security and integrity of the IT environment, sensitive information on university community members, intellectual and educational assets, research data and institutional operations is a fundamental responsibility of the university. Disaster preparedness is a must for the continuity of operations and functions of the university if disaster strikes.

We must work together to promote a strong and secure infrastructure and excellent practices to protect that infrastructure. Developing and deploying appropriate policies and effective enforcement means to secure the integrity of information technology resources, safeguard institutional information and protect the privacy of university community members as they engage in online activities.

Recommendation 17 – Identify, Assess and Manage Security Risks

IT security is the responsibility of all members of the Case Western Reserve University community. The community relies heavily upon the expertise of IT to define standards, based upon best practices, to develop and implement policies and to enforce them, ensuring that the community is best positioned to defend the integrity of the university. First and foremost, the university must establish formal assessment strategies and continually work with university partners to ensure the CWRU information environments are secure.

Action Item 17.1: Implement a formal security risk management program. Perform regular risk assessments for critical IT infrastructure and important university business/academic areas and risk reporting/risk action decision-making by university executive leadership.

Action Item 17.2: Assess the need for regular security audits that may include an audit of the separation of services handling sensitive information from public information systems.

Recommendation 18 – Protect and Ensure the Continuity of the Institution in the Event of Disaster

Information technology is a strategic asset of the institution. Loss, in part or total, of the IT environment, services and data can cripple the institution. CWRU must be prepared for the recovery of critical services in a timely manner so that the university can continue to function in the aftermath of an outage due to natural or human-made disaster.

Action Item 18.1: Develop a business continuity plan (BCP) for university IT systems, in partnership with the university Business Continuity Coordinator and the university community. This plan should also develop prudent and reasonable funding models to be able to react and recover from any disaster. These plans must be regularly updated with prescribed measures implemented for use, if needed, in the event of covered incidents.

Strategic Initiatives, Recommendations + Action Items

Recommendation 19 – Promote and Implement Security Focused Policies and Practices and Secure the IT Infrastructure

Case Western Reserve University must secure its environment at high levels. Best practices must be developed for a diversely IT equipped community, particularly students, as all university members must be able to securely engage with the university IT environment. IT infrastructure must be designed with security as a key element, be auditable and be protected from data loss threats. Applying an in-depth defense strategy to all current and new network and cloud-based systems and services must become the new normal. CWRU needs to evolve security beyond device-based controls and move to a strategy based upon the identity and role of individuals who are authorized and then authenticated for access to information and resources.

Action Item 19.1: Establish mechanisms to respond systematically to security incidents through the creation of a security operations center that implements established incident management workflows and regularly assesses lessons learned in order to improve security risk management.

Action Item 19.2: Develop identity-based and role-based strategies to provide access to CWRU's data and infrastructure both on-campus and in cloud services. Enterprise authentication services must be strengthened to protect from threats to our globally accessible information systems, while balancing the need for simpler methods of authentication.

Action Item 19.3: Develop and communicate guidelines for the secure adoption and support of cloud-based solutions, including infrastructure and hosted third-party application solutions, to allow CWRU to provision secured cloud or virtual computing environments.

Action Item 19.4: Develop a basic set of security programs and communicate fundamental security practices that will better protect the university's information and technology assets. IT should lead efforts to develop communication and education programs, including targeted training seminars, that will improve the awareness and understanding of the university community about IT security and CWRU policies in regard to IT security.

Action Item 19.5: Information Security staff will work to reduce the threat surface and secure all information resources through the development of university-wide best practice policies that, in turn, are fully embraced and enforced by the university leadership

Strategic Initiatives, Recommendations + Action Items

Initiative VI: Support and Expand the Use of Institutional Data in Decision-Making

Data has real, measurable value in multiple realms. The foundation of quality decision-making is rooted in the accuracy of the data. Accurate, timely data is critical to business of the university. All members of the CWRU community must have appropriate and timely access to the information needed to do their work in whichever role they perform.

Students require information to enable their learning, whether it is enrolling for courses, applying for financial assistance or interacting with their instructors, advisers and administrators across the university. Faculty rely on institutional information in applying for grants, managing their courses, advising students and building, manipulating and sharing data in support of their research. Staff use their access to information to fulfill their roles and serve the university community by utilizing fact-based decisions supported by real-time data. Data is the foundation of our decision-making, so we must also carefully manage data to ensure that we know where it is, can rely upon its accuracy and can obtain it when and where we need it.

Recommendation 20 - Improve Access to Information and the Collection, Care and Availability of Data

Data accessibility involves the ease with which users obtain information. Timely access to accurate data is essential to improving the quality and efficiency of university decision-making. It is less costly to maintain timely, accurate data in a managed repository and then share it, than it is to maintain duplicate data in multiple locations. The university holds a wealth of data, but it is stored in separate incompatible databases, in different formats and with different definitions. The speed of data collection, creation, transfer and assimilation is driven by the ability of the university to efficiently share these islands of data across the institution. Shared data will result in improved decisions since we will rely on fewer sources for more accurate and timely managed data for decision-making. Electronically shared data will result in increased efficiency when existing data entities can be used, without re-keying, to create new entities.

Action Item 20.1: Complete a comprehensive inventory of systems, applications and data sources across the university in order to develop processes to support the assessment and alignment of data stewardship practices and policies. These policies need to promote responsible, timely, accurate and well-documented data across the university.

Action Item 20.2: Through standardization of data sharing practices and reporting across the university, empower timely, fact-based decision making for faculty, staff and students so they can access the data necessary to perform their duties.

Action Item 20.3: Adopt and enforce common data access policies and guidelines for application developers to ensure that data in new and legacy applications are available, usable and interoperable in a shared environment.

Recommendation 21 – Infuse Data Analytics into Decision-Making

Today, data analytics can describe everything from transactional reporting to how a student learns. Data analytics include information dashboards supported by real-time data streams such as student engagement, cash flow, utility usage, etc. These dashboards, reports and metrics provide insight into what is happening in a particular area of the university, such as student retention, and possibly predict what could happen in the future. The university needs to prioritize the areas of business where analytics will help the most with better decision-making.

Action Item 21.1: Collaboratively develop a plan for implementing data analytics including the provisioning of technology tools, hiring or training of skilled data science professionals and analytics training for end-users to support both day-to-day decision-making and institutional research for learning analytics, student retention and success and business operations. This plan will define areas where analytics are needed and will include the development and introduction of a maturity model for analytics, which includes descriptive, diagnostic, predictive and prescriptive analytics.

Action Item 21.2: Provide education and training to promote a common vocabulary used within data analytics.

Action Item 21.3: Develop standard data models, data elements and other metadata that define this shared environment and build a repository system for storing this metadata to make it accessible.

Strategic Initiatives, Recommendations + Action Items

Recommendation 22 – Improve Business Processes for Managing Content

Electronic documents are the lifeblood of a modern university. There are critical factors that drive how we manage our electronic files. Physical space, backup, archival, human interaction with files and categorization, copies stored in electronic folders versus two or three physical copies and the reduction in the use of paper are among these top drivers. The challenge is twofold – managing content and facilitating how people obtain that content.

Action Item 22.1: In collaboration with administrative departments, implement document management and facilitate online workflow for enterprise systems. All new systems should strive, wherever possible, to eliminate manual/paper document handling and routing for auditable workflow and environmental sustainability.

Action Item 22.2: Continuously improve the user experience in storing and retrieving information from the university's electronic resources. Ensure information is in a logical location and easy to find and use for both internal and external uses. Provide a centrally managed web server and content management system in partnership with University Marketing and Communications to improve the user experiences on university websites.

Action Item 22.3: Provide an array of electronic document storage options. While some documents should be maintained within the larger document management system, alternative solutions, such as online file systems and potential cloud storage, need to be available and supported. In addition to offering the array of storage solutions, training and education must be available for all potential solutions.

Strategic Initiatives, Recommendations + Action Items

Initiative VII: Investing and Funding Information Technology Strategically

Information technology is a strategic asset necessary for the institution to advance and stay competitive and productive in the future. As such, the funding of information technology infrastructure and services should be done holistically for agility, efficiency and effectiveness. We must find the best approach to strategically invest for today and tomorrow to create the infrastructures to support teaching, learning, research and innovations in information technology.

Recommendation 23 – Develop a Strategic and Sustainable IT Funding Model

CWRU must develop strategies for spending that provide the most effective results from those investments. This requires approaches that align funding, and spending, on IT to strategic priorities and a management structure to ensure the long-term cost effectiveness of IT solutions. While recognizing the unique nature of CWRU, there is value in assessing and aligning our IT investment strategies with those developed (and developing) at peer institutions. We need a firm handle on the cost of our IT activities and, at the same time, we must measure the quality of the outcomes of existing investments in those activities. We must be able to manage our investments with the goal of transparency and alignment with strategic initiatives.

Action Item 23.1: Partner with university leadership to explore, develop and implement funding mechanisms and governance structures for information technology that incentivize balanced, long-term and cost effective investments in IT. Create guidelines to define services that are fundamental to the mission of the university and those to be provided on a pay-per-use model.

Action Item 23.2: Establish a costing model that enhances financial insight into the factors affecting the cost and quality of IT services. This model must enhance reporting, transparency, strategic decision making and the division's value to CWRU.

Action Item 23.3: Partner with university leadership to develop a standard for a campus-wide, best practices-based approach to lifecycle replacement of physical IT elements. This may include, but are not be limited to, enterprise infrastructure, mobile devices, laptops or any other device that is connected through CWRU's environment.

Action Item 23.4: Partner with university leadership to restructure the IT funding model to optimize for best practices, security and ongoing costs. As cloud services are provisioned, this model must include establishing a best practices approach for transitioning capital investment to operating expense, as well as a provision for compensation and professional development costs for critical IT staff managing the services.

Action Item 23.5: Assess IT purchasing processes and agreements to leverage scale and usage in order to bring overall consistency and savings to the university. IT licensing contracts shall be reviewed and negotiated upon initiation or renewal to ensure stewardship of university resources. When appropriate, agreements should also include the ability for the CWRU community to purchase for personal use.

Strategic Initiatives, Recommendations + Action Items

Initiative VIII: Attract, Retain and Empower Technology Team Members

IT plays a vital role in the success of Case Western Reserve University. As we address the needs of CWRU, we must recognize that IT's success depends on the commitment and talent of its staff. The department must provide meaningful recognition to those who excel in their roles, as well opportunities for growth and advancement.

IT at CWRU must attend to and invest in "the human element" as it is what makes our other investments effective. Through a deliberate effort to promote diversity in the workplace, IT seeks to improve our multi-generational team of professionals to move CWRU into the future. We will strive to attract and retain highly skilled individuals to help empower our service delivery efforts to the university.

Recommendation 24 - Attract and Retain Highly Effective IT Personnel

Case Western Reserve University depends on the effective use of IT for instruction, research and administration. As the global demand for IT professionals continues to exceed the supply, and our current workforce matures, CWRU (and the higher education community more broadly) faces a long-term staffing challenge. Just as industry has had to respond to the tight labor market, CWRU must develop its own multi-faceted approach to recruiting and retaining the IT professionals it needs to meet ever-expanding technology requirements. While compensation and benefits strongly influence the ability to recruit and retain highly effective IT staff, CWRU must also recognize that effective and supportive leadership for technologists is equally important to recruit and retain valuable employees.

Information technology is an ever-changing discipline. Skills and experiences acquired today quickly give way to needs for new knowledge and capability in different tools within a very short period of time. Today's IT workers recognize this and the best will display an immense ability to be flexible and adaptable. However, CWRU can ensure this proclivity for skill development is supported with education and training programs that allow these workers to adapt and continue to serve the university.

Action Item 24.1: Build a strategic roadmap for IT staffing that addresses all levels of professional experience, diversity and the university's long-term need of enabling innovation and allowing for agility to better respond to demands.

Action Item 24.2: Implement a program to encourage and facilitate staff professional development to ensure they have the relevant knowledge and skills necessary to succeed and meet the IT demands of a top-tier research university.

Action Item 24.3: Build and develop management and leadership capacity, succession planning and capability to meet the current and future needs of the IT organization and optimize the organization's value.

Action Item 24.4: Assess current talents in IT at CWRU and, as part of IT centralization efforts, develop a plan and organization to leverage existing skills for the greatest stewardship and user experience.

Action Item 24.5: Assess IT industry and higher education peer institution trends to develop a long-term compensation model to support the goal of attracting, hiring and retaining skilled technology personnel.

Strategic Initiatives, Recommendations + Action Items

Initiative IX: Centralize University-Wide IT Services and Resources

In early 2016, the university's leaders directed that all technology be centralized under the CIO. This decision came after university-based assessments regarding cyber security, business continuity and disaster recovery - as well as knowledge of national and global threats to information security - along with steps governments and organizations have begun to take in response. In sum, the university's previously distributed IT model posed great danger to the university's ability to protect data and maintain operations.

Beyond critical improvements to the university's information security and business continuity efforts, centralization also will remove barriers to the delivery of a consistent IT experience across the university. It also will optimize the university's IT investments by reducing redundancies and enhancing economies of scale in services and purchases. Additionally, it will also provide additional professional development opportunities for the CWRU IT professionals.

Beyond specific goals and initiatives, this plan will help inform and shape IT centralization. Key objectives of this effort include:

- Reducing the university's information security risk;
- Enhancing ongoing management of existing and emerging information security threats;
- Improving business continuity and disaster recovery readiness;
- Improving the IT experience across the university; and,
- Optimizing university investments in IT.

Throughout the process of centralization and after its full implementation, IT will develop and update performance indicators to help highlight areas of access and opportunities for improvement. These indicators likely will involve a combination of quantitative and qualitative information.

Recommendation 25 - Reduce and Effectively Manage the Information Security Risk Profile of CWRU

Global developments and results from a university data security audit, underscore the necessity of enhancing information security. The university's ability to achieve that imperative required a far more centralized model for capturing, transmitting and storing data, among other technological functions.

Action Item 25.1: Complete an assessment of all devices connected to the university network that represent a potential security risk. Provide mechanisms for identified systems that currently reside outside the Data Center a way to operate in a secure fashion.

Action Item 25.2: Create sustainable, repeatable and scalable business processes that will enable the deployment of new server and storage environments in a manner that meets the needs of the University and ensure that these devices are adequately secured.

Action Item 25.3: Develop a strategy for ensuring the consistency of the technology experience and protection of data is flexible and adaptable to emerging trends, as well as the needs of the university community.

Action Item 25.4: Develop and provide information security awareness training for all CWRU personnel.

Action Item 25.5: Develop policies for appropriately storing and sharing university data.

Strategic Initiatives, Recommendations + Action Items

Recommendation 26 - Ensure Business Continuity and Disaster Recovery Readiness by Leveraging Best-Practices Across the University

Running a successful organization requires an understanding of how to serve customers, regardless of market conditions. Business continuity plans help organizations stay running during natural disasters, economic downturns and bad publicity. A comprehensive business continuity plan forces leadership at CWRU to review the weaknesses and threats to the university from a detached perspective.

Action Item 26.1: Collaborate with the university's Business Continuity office on a business continuity and disaster recovery readiness assessment for all applications critical to mission and business.

Action Item 26.2: Work collaboratively with the Business Continuity office to create a comprehensive and consistent business continuity and disaster recovery plan for all of IT infrastructure.

Action Item 26.3: Conduct regular disaster recovery and business continuity exercises and train IT and university personnel on processes required to restore university operations in the event of a disaster.

Action Item 26.4: Ensure that all university personnel working with university data are trained adequately in deploying solutions that ensure business continuity and disaster recovery.

Recommendation 27 - Improve the IT Experience Across All Areas of the University

As the centralization process unfolds, service excellence must improve at all levels of the university. During this initiative, it is very important that communications are clear and accurate; CWRU's service management model meets and exceeds the university's needs, a strong stable IT foundation, reliable hardware and applications that are utilized in the most effective manner. Most importantly, a network that is secure and sustainable.

Action Item 27.1: Adopt service management best practices across all areas of the University IT infrastructure and applications, including service strategy, service design, service transition, service operation and continual service improvement.

Action Item 27.2: Develop an architecture, funding model and support strategy that creates a consistent technology environment for all campus learning spaces and conference rooms.

Action item 27.3: Develop an IT support structure that delivers a consistent, "just-in-time" level of support accessible by all areas of the university.

Action Item 27.4: Garner and leverage IT's human and financial resources to provide enhanced user experiences and better stewardship of university resources.

Action Item 27.5: Improve the skills of IT professionals and use consistent tools and processes to resolve technology problems more quickly and provide better service to CWRU faculty, staff and students.

Action Item 27.6: Develop and implement assessment processes and strategies that engage university constituencies in providing regular feedback regarding the effectiveness of IT services and solutions. Utilize this feedback to make data-driven decisions for continual service improvement.

Action Item 27.7: Strategically design, implement and measure a comprehensive communications plan to guide and promote all activities related to ongoing "Centralize IT" efforts.

Strategic Initiatives, Recommendations + Action Items

Recommendation 28 - Optimize the University's Investments in IT

Technology is an inherent part of the university landscape. CWRU has already made significant investments to ensure top-notch technology is provided university-wide. CWRU must be prepared to continue to invest in new devices, networks, experienced staff and system upgrades to stay competitive. When leveraged effectively, IT will help the university grow, streamline processes and improve the efficiency of its work force.

Action Item 28.1: Maximize the university's investment in hardware and software by leveraging volume pricing that serves the needs of the entire university community.

Action Item 28.2: Match current services with needs, structure a plan strengthened by recognition of congruencies and develop a new model to capitalize on such congruence across the university.

Action Item 28.3: Model industry best practices to implement internal common service management practice and tools.

Action Item 28.4: Reduce duplication of effort and increase efficiencies of services, purchases and return on investments.

Action Item 28.5: Develop a standardized and managed approach to procuring IT resources across the university. Ensure that the appropriate IT leadership and professionals are involved in decisions that procure technology on behalf of the university.

Recommendation 29 – Foster Professional Growth and Development

Centralization affords CWRU IT professionals from across the university greater access to the most current information and professional development opportunities. These professionals will have increased opportunities to interact with colleagues and potential mentors engaged in similar and/or related IT fields. Furthermore, through the centralization process, professionals will have potential increased possibilities for career advancement.

Action Item 29.1: Advance IT centralization by evaluating current talent and experience within the university, structuring a plan to harness these skills and developing a new unified organizational culture.

Action Item 29.2: Provide training, education, coaching and mentoring to all IT members to advance their careers.
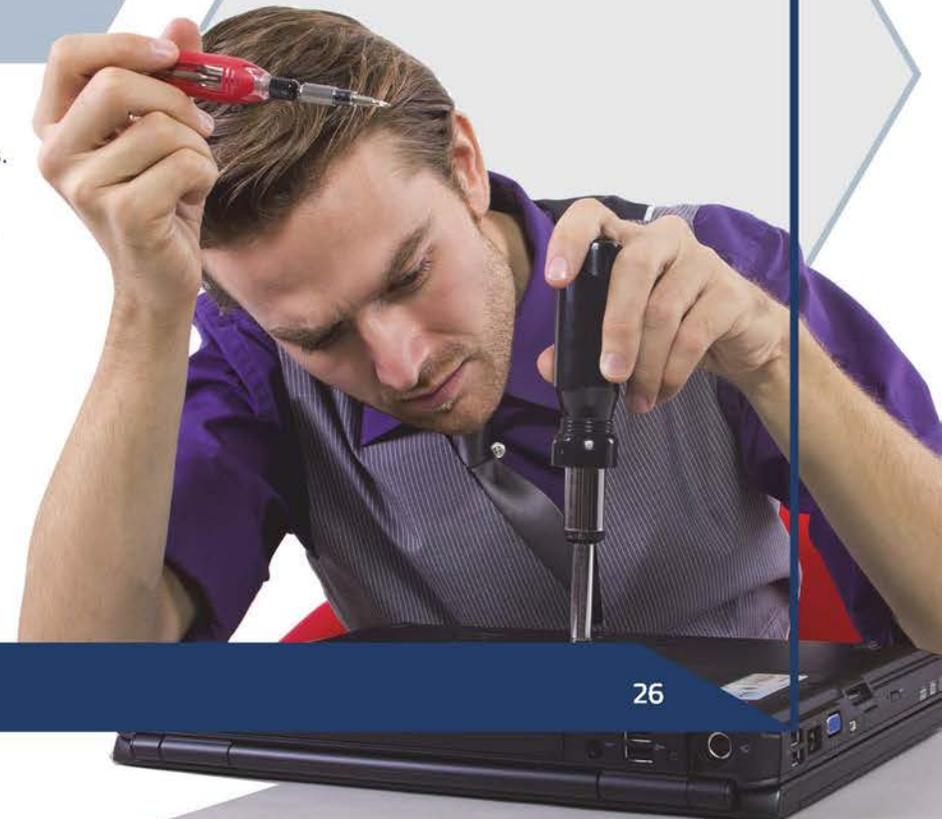
In Closing

It is a privilege to serve the university's technology needs as faculty, staff and students advance the university's mission. Some work to find cures, develop systems to protect the country, provide enhanced learning experiences, write a symphony, design a sustainable building and literally thousands of other endeavors. This strategic plan provides a path for IT to improve its work to offer the university community greater opportunities and broader options to pursue new knowledge and deepen understanding.

Thank you and let's continue to work together to re-discover our value, re-invent solutions, re-connect to our core audiences and *[Re]-Imagine IT*.

Acknowledgements

Critical Review Team Members

We would like to thank the following Critical Review Team members for their time and effort in the evaluation and development of the IT Strategic Plan. Through this team's dedication, attention to detail and constructive feedback, this plan addresses needs and desires of the entire university community. We are grateful to this diverse team of university community members in helping to *[Re]-Imagine IT*.

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Additional Group Meetings, Individual or Open Forum Discussions

Academic Affairs Council
Active Learning Fellows Members
Advisory Committee on Research Computing (ACRC)
Campus Planning and Facilities Management
Campus Services: Leadership Team
Case School of Engineering: Dean, Associate Deans and Department Chairs
College of Arts and Sciences Chair Council
College of Arts and Sciences Department Administrators
Core ERP Leadership Team: Registrar, Finance and HR
CWRU Alumni Board Meeting
Development Office
Enrollment Management
Executive Faculty Senate
Faculty Senate
Flora Stone Mather Center for Women
Frances Payne Bolton School of Nursing: Open Forum
Government Relations Department
Graduate Student Council (GSC)
International Affairs Department
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[U]Tech Staff
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Office of Finance (CFO): Leadership Team
Office of Planning & Institutional Research
Research Administration
School of Dental Medicine: Dean, Associate Deans and Department Chairs
School of Law: Dean's and Senior Management Team
School of Medicine: Dean, Associate Deans, Department Chairs & Expanded Leadership Team
Squire Valleevue Farm
Staff Advisory Council (SAC)
Student Affairs Leadership Cabinet
Student Government Representatives Lunch
Undergraduate Ice Cream Social Hour: Open Forum
Undergraduate Student Government
University Marketing and Communications
Weatherhead School of Management: Dean, Associate Deans and Department Chairs

To submit a question about [Re] Imagining IT, Case Western Reserve University's Information Technology Strategic Plan, visit http://goo.gl/forms/Af4jyf8xX6DzNBPp1

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