Moving Wellesley Forward:
Strategic Directions for
Library & Technology Services

December 2012

Moving Wellesley Forward:
Strategic Directions for Library & Technology Services

Introduction

In general, strategic plans for technology organizations have been deemed dangerous. Despite the fact that many such plans are for the short term, the assumptions one has to make in developing such plans go by the wayside because of the fast paced changes in technologies. This should not stop us from formulating a plan based on what we know today and what we believe are the general trends. We want the community to have a general idea of what are our plans, why and how we plan to accomplish them.

Library and Technology Services goal is to provide the best services to all Wellesley College community members. Whereas supporting the core academic mission of the college is of primary importance to us, we are equally committed to providing the best service to the administrative offices and supporting core technical infrastructure. The fast pace at which technologies are evolving, the varying rates at which different constituents adopt them and our own desire to be supportive of such variance with limited resources is a daunting challenge. What you will see below is an attempt to strategize precisely around this challenge.

We approach our strategic plan under four themes – **Expanding Access, Strengthening Partnerships, Providing a Scalable, Sustainable & Agile Infrastructure & Mitigating Risks.**

Expanding access covers everything from access to library resources to equal access to computing resources for students to data liberation. Under this theme we discuss the plans for the complex management of information resources – both print and digital, supporting faculty research and scholarly communication, and digitization of holdings in our special collections and archives to make them accessible more widely. Our commitment to advancing Open Access policy for scholarly publication is strong and we will work with the faculty to move this forward. Equal access to computing resources for students regardless of their ability to afford is an institutional goal and we want to be a creative partner in help accomplish this goal. We also provide an insight into plans for the democratization and easy access to institutional data through powerful analytics tools.

As a service organization, we have to develop strong partnerships with the community members to advance our strategic initiatives. Strengthening this partnership requires us to first listen. And then present a palette of options that we believe are best suited to help solve problems or enhance what one does. Under the Strengthening Partnerships theme we outline a broad set of responses based on what we heard from the community. This theme is centered on elevating academic support to a whole new level.

The foundation to be able to deliver excellent services relies on having a reliable infrastructure. However, when we are resource constrained, we need to think creatively and provide a scalable, sustainable and agile infrastructure. We discuss various plans including adopting wireless and mobile computing support in large scale, revolutionizing the business processes in College by moving to digital workflows using agile computing practices, and boldly transitioning to open source software

solutions & cloud computing in a very strategic fashion. The College joining edX provides yet another opportunity for us to learn and support MOOCs (Massive Open Online Courses) that will be taught by our faculty. Many of what is discussed here have been part of an organic strategy over the past two years through which we have proven how much can be done in a short time and have gained the respect and trust of the community. We will build on this foundation to move us forward.

Finally, in this well connected world, the need to be vigilant about data is far more important than ever. We can never forget the risks that we have to take in order to advance the strategy put forth so far. Under the theme Risk Mitigation, we outline some of what we have to do in terms of information security and business continuity.

We are energized and excited to move Wellesley forward as outlined below.
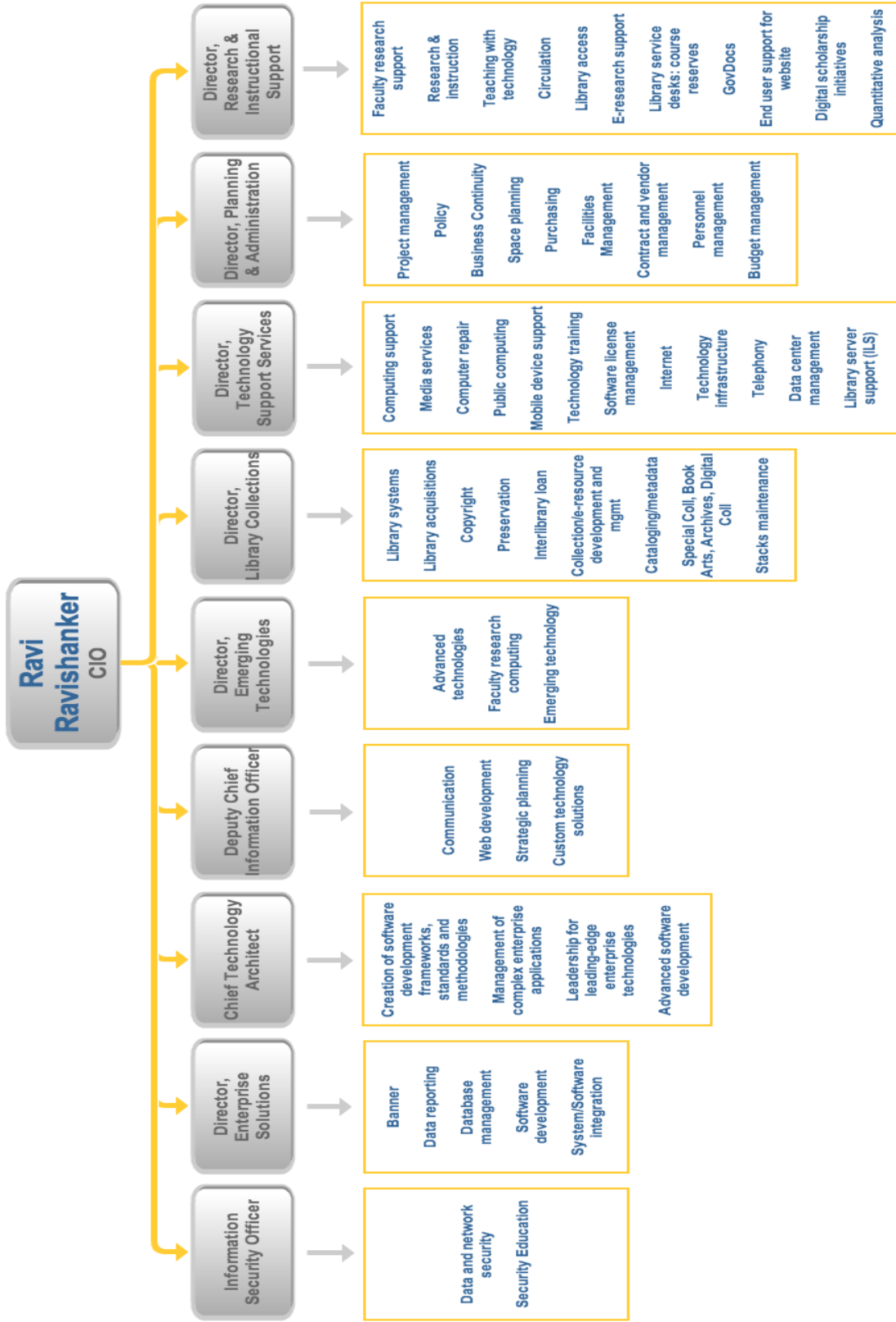
Who We Are

LTS was created in 1994 as a result of a merger between the Library, Information Technology Services, and Information Systems and Telecommunication. Under the direction of the Chief Information Officer (CIO), LTS is responsible for a variety of academic and administrative support services that fall within these 7 areas:

- Communication, Administration and Planning
- Computing and Media Support
- Emerging Technologies
- Enterprise Solutions
- Library Collections
- Research and Instructional Support
- Systems and Networking Support (including Information Security)

The department has just over 80 FTE staff and hires roughly 200 students annually. The LTS senior leadership team meets with the CIO on a regular basis and has representation from each of the 7 support areas.

The CIO reports to the College Provost within the academic division of the College. LTS receives input from a number of advisory committees, including the Advisory Committee for Library and Technology Policy (ACLTP); the President's Cabinet, the Library and Technology Services Student Advisory Group (LTSSAG); The Project Priorities Advisory Committee (PPAC); and the Archives Committee. LTS also works with partners representing each of the divisions on the Technology Support Group (TSG). TSG members provide technology support for their individual departments and act as liaisons to LTS.

Library & Technology Services
Functional Organizational Chart, March 2013

Ravi Ravishanker, CIO

Director, Research & Instructional Support
- Faculty research support
- Research & instruction
- Teaching with technology
- Circulation
- Library access
- E-research support
- Library service desks: course reserves
- GovDocs
- End user support for website
- Digital scholarship initiatives
- Quantitative analysis

Director, Planning & Administration
- Project management
- Policy
- Business Continuity
- Space planning
- Purchasing
- Facilities Management
- Contract and vendor management
- Personnel management
- Budget management

Director, Technology Support Services
- Computing support
- Media services
- Computer repair
- Public computing
- Mobile device support
- Technology training
- Software license management
- Internet
- Technology Infrastructure
- Telephony
- Data center management
- Library server support (ILS)

Director, Library Collections
- Library systems
- Library acquisitions
- Copyright
- Preservation
- Interlibrary loan
- Collection/e-resource development and mgmt
- Cataloging/metadata
- Special Coll, Book Arts, Archives, Digital Coll
- Stacks maintenance

Director, Emerging Technologies
- Advanced technologies
- Faculty research computing
- Emerging technology

Deputy Chief Information Officer
- Communication
- Web development
- Strategic planning
- Custom technology solutions

Chief Technology Architect
- Creation of software development frameworks, standards and methodologies
- Management of complex enterprise applications
- Leadership for leading-edge enterprise technologies
- Advanced software development

Director, Enterprise Solutions
- Banner
- Data reporting
- Database management
- Software development
- System/Software integration

Information Security Officer
- Data and network security
- Security Education

LTS Fast Facts for FY12

1,829,857 Number of items in the Library's Collection, 39% of which are electronically available.	**337** Number of course-integrated classes taught by librarians and instructional technologists.
243,567 Journal articles used.	**1300** Number of reference questions answered.
62,390 Journals available through library subscriptions, 99% of which are electronically available.	**1000+** Number of events supported by Media Services.
7998 Ebook titles used.	**400** Individual and group research/assignment consultations provided by reference librarians.
12,000+ Inquiries from faculty, staff, and students triaged by Help Desk. (The four most common ticket topics are: network access (16.7%), Google (14.5%), other software (9.6%), and student computer help (8.6%).)	**3500** Speech operator calls received by the Help Desk.
5646 Number of times equipment kits were circulated, including laptop/netbooks, iPads, video cameras, clickers, and audio recorders.	**27,000** Full-text downloads of materials from the Institutional Repository.
64.59 Miles of fiber optic cable	**5,000** Network accounts
40 Physical Servers/ **200** Virtual Servers	**8** Cloud services

Planning context

The LTS Strategic Plan reflects the information gathered over the past couple of years from formal and informal conversations with the Wellesley College community. Many members of the community participated in this planning process to guide and shape the strategic directions outlined in this plan. Participants provided their feedback through a number of fora, including meetings with academic and administrative department heads and senior administrators, informal gatherings with faculty and students, and a multi-event symposium which is described below.

In Spring 2012, LTS collaborated with the faculty to present a series of seven events as a part of our symposium titled "Liberal Arts Learning in the Digital Age". Event topics included Interdisciplinary Science, Digital Humanities, Digital Media, Quantitative Analysis, Data Security, Open Access and the Learning Commons model. In many cases faculty presented their current work and presented challenges that they face going forward and how LTS can assist.

Several common themes emerged over the course of these conversations. They ranged from attending to such basic needs as making the classrooms more flexible with easy to use technologies to using technologies to support interdisciplinary collaboration, team-based projects and problem solving. We heard clearly the value of apprenticeship opportunities for students in the use of advanced technologies, and the recognition of a number of (new) required literacies and skills including computational, visual/aural/media, quantitative, spatial, and financial. These themes, although common, were expressed in the unique context of each discipline and so as to meet the identified needs, the College will need to look to both campus-wide and specialized solutions, including spaces, services and resources (both financial and human).

The community is also very interested in our proposal to create an Academic Commons in the libraries, which conceptually utilizes the spaces in the libraries for service delivery while creating a social atmosphere conducive to productive academic collaboration. There is considerable interest in expanding the scope of our Archives as well as digitizing the current holdings in our special collections and archives to make them easily accessible to not just our students and faculty, but also to the alumnae and other interested scholars around the world. With considerable interest from the faculty in all disciplines, we have initiated planning for a Book Studies program, which, we are very confident, will mature into a full-fledged program, requiring ongoing commitment and support.

Open Access to Scholarly Communications is a topic of interest to LTS as well as to many faculty members. We support the faculty in their discussions of an Open Access resolution, which would encourage faculty to deposit copies of their publications in the institutional repository as a record of Wellesley's scholarship.

Core Strategic Themes

Summary of Strategic Goals

Theme 1: Expanding Access
- Expanding Library Collections
- Improving Discovery and Access to Library Collections
- Digitizing Unique Collections
- Preserving the Scholarly Record
- Enhancing Archives and Special Collections Holdings
- Equalizing Student Access to Technology
- Data Liberation

Theme 2: Strengthening Partnerships
- Building Book Studies into the Curriculum
- Designing and Constructing an Academic Commons
- Establishing Academic Centers for Advanced Technology Support

Theme 3: Providing a Scalable, Sustainable & Agile Infrastructure
- Mobility First
- Cloud Computing
- Organizational Transformation
- Open Source Solutions
- Sustainability
- Flexible Classroom Spaces

Theme 4: Mitigating Risks
- Providing redundancy for key services for improved business continuity
- Limiting Access to Protect Confidential Data

Theme 1: Expanding Access

LTS strives to expand access to information, both internal institutional data and externally published content, by providing students, faculty and staff with access to the information they need, through well designed, intuitive interfaces, at the time that it's needed. Ensuring the availability of appropriate technology for the access and use of information to support learning is a related area of focus. Providing access to information resources and the tools to use them support the College's core academic mission of teaching and scholarship.

Expanding Access

Expanding Library Collections

Continued access to excellent library collections and services, which support the learning, teaching and research of today's and future scholars

Digital content has changed how researchers access information and how libraries purchase information. Wellesley College Library provides access to robust journal and book collections. Students and faculty now have access to 70,000 journals, an enormous increase over the 4500 journals in the collection ten years ago, when print predominated. The book collection has also grown, as we have taken advantage of beneficial pricing models to acquire expansive ebook collections in addition to the 8,000 print books we acquire annually. In so doing we have increased the number of titles available while reducing the pressure on stack space. Now more than a third of the books and documents in the collection are ebooks. We continue to acquire print and digital resources, depending on availability and patron preference.

We increasingly collaborate with publishers and information partners to influence the development of future publishing and business models to ensure that current and future students and faculty have access to the research resources they need to succeed as scholars. We encourage faculty authors and publishers to make content available as open access when possible. We encourage publishers to provide flexible business model options such as: big deals (one price for all of a publisher's frontlist), tiny deals (article or chapter level purchasing), and purchase on demand. We build and maintain relationships with other libraries so that our students and faculty can have access to the holdings of library collections around the world through resource sharing.

We are strong supporters of the Open Access resolution introduced at the Academic Council recently by Prof Metaxas and believe that this will play vital role in increasing access to scholarly publication.

Resources Required
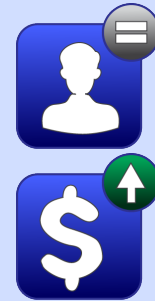
Cloud Solution

Challenges
- Increasing material costs
- Purchasing models in transition
- Increased user expectation of immediate access

Partners
- Students
- Alumnae
- Faculty
- Publishers
- Information Vendors

Note:

Thanks to our generous Alumnae, a significant portion of our collections are paid for through endowed funds & we should explore ways to make the entire collection budget to be through endowed funds.

Expanding Access

Improving Discovery and Access

Simplified discovery and access to pertinent information

As the collection of information resources that are available to students and faculty expands, discovery of pertinent information becomes more complex. We utilize advanced library systems to simplify discovery and access to library collections. For instance, SuperSearch, which provides one search box for nearly all of the library's print and digital sources, was deployed in 2011, and has greatly simplified the discovery of items within the library's collections. But we also need to plan for the next generation library system that will underpin the delivery of library collections and services at Wellesley.

Library management systems are in a period of transformation. The changes in library collections have dramatically altered how libraries manage discovery, access, financial management and collection inventories.   Many systems are still in development and a few are beginning to be deployed by early adopters. The new generation of cloud-based systems promises to transform library management, increase efficiencies, reduce costs, and improve access to the library collections. LTS is actively monitoring the systems in development and will select the system best suited to our local needs, exploring both proprietary and open source solutions.

Access to institutional data pose a whole set of issues. Lack of clear and coherent institutional definitions for even the simplest of terms such as who is a full time student results in inconsistent information. In partnership with many administrative offices, we are on a path to resolve this issue so that data access becomes easy and consistent, as described below in Data Liberation.

Resources Required

Cloud Solution

Challenges
- Increasingly larger and complex collections

Partners
- Library system vendors
- Open source collaboratives

Expanding Access
Digitizing Unique Collections

Expand access to unique, local collections for everyone

As a member of the global scholarly community the Library has both great opportunities and great responsibilities in providing access to and preservation of collections of value to Wellesley College students and faculty, as well as local and international scholars. In 2007 Wellesley College began digitizing books from our collection through the Boston Library Consortium's participation in the Open Content Alliance/Internet Archive. We have so far digitized over 4000 books from the library's circulating collections and the College Archives. In partnership with Baylor University, we completed the digitization of one of the library's most treasured collections, the Browning Courtship Correspondence. The continuing digitization of our unique, locally held collections will benefit the College and the international scholarly community. We continue to allocate funds from LTS budget for this important initiative. However, additional resources are needed to continue or increase this level of funding to allow us to expand the digital collections.

Creating digital copies of our unique collections is of course only the first step. Digitized collections must be discoverable, accessible and preserved. LTS staff create metadata for each item digitized and incorporate this metadata into local and international discovery tools. As we expand our digitization efforts we will require additional resources for metadata creation associated with these collections.   As LTS becomes responsible for more digital assets, long-term digital preservation becomes a key issue--one which the entire library community is currently wrestling with. The creation of a digital repository to manage these assets and make them accessible is a good first step, but preserving materials over time is an emerging area that will require significant resources.

Resources Required
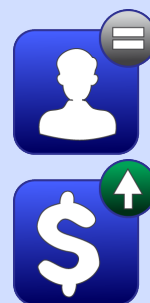
Cloud Solution

Challenges
- Costs associated with digitization
- Metadata creation
- Long-term preservation

Partners
- Local and international scholars
- Boston Library Consortium
- Open Content Alliance
- Digital Commons

Note

This is another area where we believe that several alumnae will be enthusiastic sponsors providing the needed financial resources.

Expanding Access

Preserving Scholarly Records & Digital Data

Preservation of the scholarly works and institutional data of importance for the future needs of the College and for the larger scholarly community

The Library has been a leader among its peers in the preservation of library collections, and it remains strongly committed to the preservation of the scholarly record for the future needs of the College and for the larger scholarly community. We follow conservation best-practices when using a number of strategies for prolonging the useful life our collections (repair, boxing, deacidification), activities that are now supported almost exclusively by an endowment established for this purpose by Barbara Lubin Goldsmith '53. We plan to provide these conservation treatments for our unique holdings, particularly those in Special Collections and Archives.

We currently do not have a College policy on preserving digital data. We comply with certain regulatory requirements for financial data. However, it is extremely important for us to develop a strong records management program that clearly defines a preservation strategy for electronic records of relevance. In addition, we need to develop and implement a preservation strategy for various campus and presidential communication of historical significance.

Resources Required

Cloud Solution

Challenges
- Aging Materials

Partners
- Science Faculty and Administrative Staff
- Boston Library Consortium
- Other regional libraries and consortia

Expanding Access

# Enhancing Archives and Special Collections Holdings

Providing students and faculty with expanded unique research collections and research opportunities

The use of the library's unique and rare holdings found in Special Collections and the Archives has increased dramatically. Digitizing these materials provides one solution to address some of the needs of the community and other scholars regarding access and use. In addition, it is a priority to highlight the unique resources held in Special Collections and the Archives by creating facilities and services that further encourage use and engagement. There is an opportunity to exploit Wellesley's unique resources in the history, art and technology of the book by taking a leadership role in integrating Book Studies into the curriculum of the College (see below). By focusing contracted and in-house preservation efforts on these collections we can ensure that they will be available for future Wellesley scholars. There are ongoing efforts to more optimally organize and describe these collections to enable scholars to discover and precisely identify particular resources in the library catalog and other search tools.

We formed a College Archives Advisory Committee recently to advise us on the collections policy for the Archives. There was considerable interest expressed in expanding the collections to include the scholarly works of our alumnae, or other works that they would like to donate, that are related to the academic mission of the College. Specifically, the committee is interested in acquiring the papers from some of the recent presidents of the College as well as Madeleine Albright and Hillary Clinton.

The current space occupied by Special Collections imposes severe constraints on the number of classes that can meet there. As a part of the Academic Commons planning, we would like to expand the space for Special Collections and make it more visible & easy to access.

Resources Required
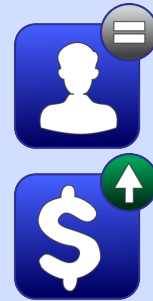
Cloud Solution

Challenges
- Competition with other institutions for collections
- Space requirements for storage and research

Partners
- Academic departments
- Senior Administrators
- Resources

Note:

Another area where fundraising efforts will help accomplish this goal.

Expanding Access

Equalizing Student Access to Technology

All students have the computing hardware needed to perform their required academic work regardless of financial ability

We estimate that 5-10% of Wellesley College students do not own a computer or that they have a computer that is outdated by our standards, due to financial circumstances. Although students might bring a laptop with them, many of these laptops are already several years old when they arrive at the College and if the laptop fails or if it cannot support the software required for the students' coursework, students do not have the resources to replace it. LTS will work with other departments on campus to help develop a long term & financially sustainable equal access model for computing devices for students. While such a long term strategy is being developed, as of Fall 2012, LTS has increased the borrowable laptop pool to 63 laptops with the ability to borrow for 4 weeks at a time. During the semester, most of these laptops are in constant use by a variety of users (students, faculty and staff).

Resources Required
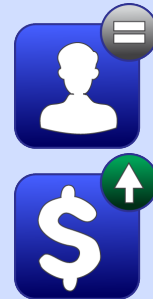
Cloud Solution

Challenges
- Equipment costs

Partners
- Students
- Student Financial Services

Note

We plan to constitute a new committee to review earlier work in this area and make recommendations to us. We believe that we can resolve this issue through creative reallocation of funds.

## Expanding Access
Data Liberation

Improved access to administrative data

Banner is essential to the administrative functions of the College, however extracting data on demand from such a complex system can be daunting. It is therefore our strategy to minimize direct interaction with Banner whenever possible. We have created a framework using open source tools to provide a visually consistent set of applications that extracts and presents data from Banner to faculty and administrative staff. We will take full advantage of this strategy going forward; simplifying community access by building systems "on top" of Banner instead of within Banner results in significant net savings.

In addition, our strategy is to move more towards business analytics for accessing institutional data rather than predefined static reports, which are inherently resource intensive and limiting. Analytics introduce the ability for an advanced end user to dynamically probe the data without having to rely on advanced technical staff. We are in the last stages of implementing such a system for the student data which will be followed by a similar approach to liberating financial data.

We are also introducing the culture of Data Driven Decision making within LTS which is significantly improving our service delivery while saving money. Whether it is the library circulation data or information resources access metrics or the web analytics, we will commit resources to monitor them to help us manage our resources wisely.

Resources Required
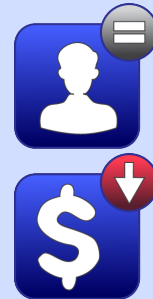
Cloud Solution

Challenges
- Complex, difficult to use systems

Partners
- Faculty
- Administrative staff

Note
Once the project is completed, we plan to remove some of the expensive software solutions currently in use. In addition, staff resources will be reallocated to areas that are currently deficient.

Theme 2: Strengthening Partnerships

LTS engages with campus partners to develop innovative campus-wide initiatives. As coursework and classrooms go digital, there are myriad opportunities for LTS to work with individual faculty members or departments to push the envelope in how technology is used in the academic program. In the administrative offices, partnerships allow outdated workflows to be addressed and improved through the use of established technologies such as document imaging. The recent partnership with Public Affairs in implementing Drupal as the web content management tool was a high risk venture, which has resulted in a much more user friendly system and a vibrant and reliable website. We will continue to seek other similar partnerships among the administrative offices to help simplify the business processes in the College.

The key to such partnerships is to listen to the faculty, staff and students and deliver solutions to address some of the pressing issues. We have demonstrated this successfully and earned the trust of our community, which now becomes the foundation for advancing this strategy further.

Strengthening Partnerships

Building a Book Studies into the Curriculum

Providing students with a study concentration that has been increasing in popularity on campus

"Book studies" is the study of the artifact, history, impact, and future of the book across disciplines. Book studies endeavors to incorporate many features of the liberal arts experience: analytic thinking, collaboration, creative thinking, experiential learning, problem solving, and visual literacy. There is considerable interest amongst the Wellesley faculty to develop this program. The Friends of the Library Fund for Innovation in Reading and Scholarship has seed funded a series of seminars to bring the faculty together to help shape the program. It is our expectation that there will be some financial implications to the College to support such a program successfully. We will be in a much better position to evaluate the financial impact a year from now.

Resources Required

Cloud Solution

Challenges
- Creating and coordinating a new academic program or concentration

Partners
- Provost and Deans
- Academic departments

Strengthening Partnerships

Designing and Constructing an Academic Commons

Centralized student academic support; community building

The Oberlin College Academic Commons project statement clearly captures what we plan to achieve: "The commons would provide centralized and coordinated research, information, technology, and learning assistance for Oberlin students. It would include an adjacent café that provides academic community space designed to encourage faculty-student interaction. It would bring together or coordinate a variety of services that are currently available in separate locations on campus and also introduce some new services. The commons would contribute to two areas of the College's strategic plan – curricular support and community building."

We believe that the creation of an Academic Commons in the Clapp library will provide a single point of service delivery that could include LTS, PLTC, Writing Program, Quantitative Reasoning, the First-Year Seminar Program and CWS services all in one place. These services co-located in Clapp Library, and adjacent to relocated student support services to be housed in Schneider by the summer of 2014, will provide students with proximate access to many of the academic and scholarly support services required.

A cafe located either in Clapp Library or the renovated Schneider building would provide a social gathering place where faculty and students have an opportunity to interact and exchange ideas.

In addition, we are radically rethinking the branch Library spaces on campus (Art, Music and Science) along with the 2025 space planners and building residents. Thinking about these spaces and how the connect to a central Academic Commons model will strengthen our Library and Technology support across campus.

Because of the importance and enormity of this undertaking, we will need to consult with a much larger group of faculty, students and staff. With Senior Staff's approval we would plan to produce a paper on the Academic Commons in Spring 2013.

Resources Required

Cloud Solution

Challenges
- Building renovation
- Relocation of academic support services

Partners
- First-Year academic programs
- PLTC
- 2025 Process

Notes

There will be significant financial impact associated with it, but the return on investment will be significant.

Strengthening Partnerships
Establishing Academic Centers for Advanced Technology Support

Dedicated support for teaching students advanced technologies used in classes by the faculty from various disciplines.

In recent years, many liberal arts colleges have realized the need to support faculty in various advanced technology areas to avoid having the faculty spending valuable class time teaching the students about the technologies themselves. The Computing & Media Center at Bates, the Mercury Consortium for High Performance Computing (Bucknell, Colgate, Connecticut, Hamilton, Hobart & William Smith, Holy Cross, St. Lawrence, and Vassar) and the Quantitative Analysis Center at Wesleyan are good examples of this trend.

A proposal has been submitted to the College for a new Quantitative Analysis Institute and LTS has agreed to provide two years of funding for a new position to support this program beginning in FY13. Using the Quantitative Analysis Initiative as a model we propose the creation of 4 additional academic centers supporting Digital Media, Digital Humanities, Computational Research and Instructional Design.

Each center (with the exception of the one for Instructional Design) will provide valuable support in teaching students advanced technologies used in classes by the faculty from various disciplines. It could be digital media support such as using 3-D modeling, animation, editing or producing sculptures designed on a computer using laser cutting devices, or using statistical and database software for data analysis.

Students will be trained to be teaching assistants or research apprentices who can either choose to do research with Wellesley faculty or to find internships.

Each of these centers will be run by a well qualified staff member who will manage all the student training as well as outreach for internships, in addition to helping faculty in their research.

Resources Required

Cloud Solution

Challenges
- Allocation of appropriate spaces
- Staffing required

Partners
- Academic departments

Note

Sensing the importance of this need, LTS has already begun reallocating staff resources in as many areas as possible. Continued investments will be needed in physical spaces and program coordination.

Faculty research support will be carried out through a combination of the staff member, the students, and, in some cases, bringing in external resources through collaboration with other Higher Ed organizations similar to our centers.

Through close faculty partnerships we will identify steps towards these centers over the next 1-3 years with additional planning and funding required to fully realize the academic center vision. The intersection of this proposal with the 2025 initiative will need to be carefully considered.

Strengthening Partnerships
Digital Workflows

Enhanced access and increased security for business processes on campus

Recent partnerships with Resources (endowment records) and Admissions (Paperless Admissions) illustrate a trend towards a paperless office environment. LTS is excited by the prospect of continuing to expand the document imaging being done on campus to improve office efficiency and sustainability. Because these changes can dramatically alter the current workflows, dedicated partnerships are required between LTS and administrative offices to ensure that the transition is managed well.

In the past year, through a home grown programming framework, we have helped move many business processes that were email or paper-based to web-based workflows. There are 35 such applications that have been developed so far. Hiring student leaders, Tanner & Ruhlman conference application process, Science Summer Research hiring are all role-based workflows that have vastly simplified & automated how students interact with academic and administrative offices. Similarly, course scheduling, faculty awards, faculty leave application are examples that have helped streamline processes affecting faculty. Our staff have enthusiastically adopted not just the software framework, but also the agility required for them to jump from one application to the next. LTS staff as well as the faculty & staff have been indoctrinated into the "Forever Beta" philosophy, meaning that all these applications are never complete – they are work in progress!

Our strategy is to revolutionize the way the College works by seeking and converting business processes to digital workflows. Again, through initial partnerships, we have paved the way on how quickly we can make this conversion and we are confident that this strategy will serve us collectively well.

Resources Required

Cloud Solution

Challenges
- Establishment of new (sometimes complex) workflows

Partners
- Administrative offices
- Academic departments

Theme 3: Providing an Agile Infrastructure

Our ability to respond to community needs efficiently depends on a flexible infrastructure which can be deployed and resized quickly as well as accessed and managed from wherever our faculty, staff, students and systems administrators are. From classrooms to server resources LTS will take advantage of new and existing technologies that provide the nimbleness required to support on-ongoing updates to research, instruction and campus workflows.

Providing an Agile Infrastructure

Mobility First

Flexibility in accessing Wellesley's information resources, collaborative work and use of physical space on campus. Reduction in cost for infrastructure upgrades/maintenance.

We continue to develop methods for delivering the College's information in new ways. Our information resources are increasingly digital and need to be viewed on mobile devices from on and off-campus locations. The integration of information with other apps and information tools provides a richer environment from which to work. To this end we continue to invest in electronic information resources, pilot the latest mobile tools for potential pedagogical and business use and collaborate with administrative offices on digital projects such as document imaging.

To further support this goal we plan to move to a wireless campus by investing in laptops for the entire faculty and staff in the next few years. While some areas of campus will need to remain wired (classrooms, computers working with resource intensive multimedia and data files, etc.) this change reduces the resources required for wired network maintenance and shifts the resources to where the computing world is predicted to go – laptops, tablets and PDAs.

Our strategy to add to our circulation significant number of iPads and laptops show that the appetite for this great. Whole classes are borrowing iPads for a whole semester to experiment with new methods of teaching and learning. Our strategy is to find ways to encourage such innovation.

As a part of the Mobile First strategy, we will begin designing our future applications to work on Mobile devices first. In order to help accomplish this, we have engaged in collaboration with students trained by our computer science department in Mobile programming to learn how students use these devices and what interfaces appeal to them most. Tanner and Ruhlman conference scheduling is one such collaborative effort.

Resources Required

Cloud Solution

Challenges
- Some workflows will require a wired connection

Partners
- Campus-wide

Note

By moving to predominantly wireless environment, we will save significantly in wired infrastructure, some of which will be reinvested in laptops & tablets.

Providing an Agile Infrastructure
Cloud Computing

Greater flexibility, potential gains in security/disaster recovery, no need for additional space or environmental updates to spaces to accommodate local resources. Potential cost savings.

As costs for maintaining on-campus hardware/software continue to increase, cloud solutions provide us with greater flexibility at a lower cost. Additional resources can be provisioned quickly and those resources automatically come with redundant back-ups and disaster recovery options. We have already moved to the cloud for some College functions (Google, Kaltura and Sakai are some examples) and we are testing cloud options such as Amazon EC2 in a number of academic support pilots this year. Keeping in mind that some resources will need to remain on campus, we will look increasingly to the cloud for solutions from file storage to processing cycles when available and appropriate.

We recently helped move Medicat, a software used by the Health Services & Counseling Services, to the cloud as a part of this strategy. We are also working with some science faculty to explore the use of High Performance Computing (HPC) in the cloud. HPC hardware are notorious for their high energy consumption and using these on the cloud also helps the environmental sustainability by shifting the computing to greener data centers and hardware.

Resources Required

Cloud Solution

Challenges
- Faculty research may require data security guarantees requiring on-campus resources
- Matching appropriate resources to specific workflows can take time

Partners
- Campus-wide

Providing an Agile Infrastructure
Open Source Solutions

Increased customization and integration of tools, well-established communities of practice

In recent years we have begun to invest more heavily in open source tools such as Sakai and Drupal and we will continue to evaluate mature open source software as we select new solutions for campus. Open source solutions can provide a significant cost savings over their commercial counterparts and provide us with the flexibility and control we need to efficiently adapt and integrate our tools for the College community as needs change. Wellesley's participation in the community of practice for each tool allows us to influence the direction of tool's upgrades and share in the cost of development with other interested partners.

Our use of open source extends to the use of Linux operating system, Apache web servers, PHP and MySQL for application development (collectively referred to as the LAMP architecture) and the use of tools such as jQuery for Mobile application development.

Open source solutions sometimes are not free. However, they provide a way for us to help deliver what our demanding community needs or wants. To this end, we plan to examine open source solutions for Library systems as well as for Banner. Kuali, which is referred to as a community source application, a variant of open source, is gaining momentum in all these areas and we will follow it closely.

We will also be shifting our classroom technology to a platform that will allow us to design and monitor these technologies more effectively using open source tools.

Resources Required

Cloud Solution

Challenges
- Adoption and migration of new systems is a complex process involving multiple departments

Partners
- Department heads

Note:

The move to Google and Drupal helped us save significant money which have been reallocated to some of the perennially underfunded academic technologies.

Providing an Agile Infrastructure
Sustainabililty

Responsible approach to technology management, cost reduction due to longer computer life cycle and fewer devices across campus

Although the environmental impact cannot always be the driving force behind our technology choices, the issue of sustainability must be a part of our planning process. A sustainable approach to the College's infrastructure includes a smaller technology footprint, a longer device lifespan and the reuse of retired resources. New initiatives including a move to more efficient cloud and off-campus server solutions, expanded implementation of virtual computing environments and thin-clients in place of desktop computers, a new policy on retired computer donation and the implementation of a print management system will reduce overall energy use and waste. Faculty/staff laptop distribution, an adequate student laptop program and the installation of more flexible classroom technologies will enable a reduction in installed classroom and lab computers and a/v equipment. The on-going transition to digital resources and workflows continue to reduce paper use across campus. Collaborations with departments across campus will identify additional opportunities for sustainable solutions (digital workflows, new technologies, etc.). LTS will be an active partner in supporting them.

We are enthusiastic supporters of the College initiative called GLOW which extends the lifespan of decommissioned computers by installing open source software.

Resources Required

Cloud Solution

Challenges
- VDI technology will not accommodate all software
- Some workflows will require "local" devices

Partners
- Cross-campus

Providing an Agile Infrastructure
Flexible Classroom Spaces

Support for existing and innovative pedagogies and digital resources/technologies

There is a strong desire to have classrooms that are multi-functional and are equipped with more modern hardware in configurations that support the vastly different ways in which instruction takes place in the College. There are many constraints that are imposed currently because of fixed screens, projectors and controls. Innovations in agile and flexible classrooms are necessary to utilize the limited classroom spaces in ways that impose the fewest constraints on Wellesley's instructors and students. In addition, we need to modernize Wellesley's classrooms with technologies such as interactive whiteboards (also known as "Smart Boards") that many students have used in their middle and high schools. We are taking small steps towards rethinking the technologies in the classroom by using an iPad to control the computer and other peripherals instead of the fixed controller in the podium.

However, we need to invest significantly in radically revising the classrooms so that many more are equipped for viewing films or high resolution images. In addition, we need to find ways to support new innovations in teaching such as the "flipping" of the classrooms whereby classroom lectures are recorded beforehand and distributed to the students and the classroom time is spent in collective problem solving. Though the physical layout and other classroom logistics (such as the shades and furniture) are equally important and will be part of the Wellesley 2025 project, the technological innovations and implementations can precede them because they can be moved around.

Resources Required

Cloud Solution

Challenges
- Classroom upgrades will need to be prioritized
- Classroom design will need to allow for continuous updates over time

Partners
- Classroom committee
- Facilities
- Faculty

Theme 4: Risk Management: Striking the Balance with Greater Access

Universal connectivity through the internet, wireless communications, and mobile and cloud computing have all made it possible for people to access information whenever and wherever they choose. However, the relative speed and ease of accessing information poses an ever greater challenge to the security and privacy of information. Our role is to provide a reliable and secure technology environment that prevents disruption to academic and administrative operations and supports the College's learning, teaching and research needs. To that end, we must continually assess both internal and external risks to the privacy and integrity of College information, and implement continuous measures to safeguard against those risks. In addition, we must maintain a dynamic disaster recovery plan for all LTS resources and services to ensure continuity and reliability of service delivery, and recovery of data in the event of a disaster.

Risk Management: Striking the Balance with Greater Access

Providing Redundancy for Key Services for Improved Business Continuity

Redundancy for critical systems; reliable business continuity; instant data recovery

During the Spring semester of 2011, Ernst and Young conducted a detailed technology risk assessment and recommended a response plan to reduce risks primarily in the area of information security. Under the direction of the CIO, LTS formed a risk response team and developed a risk response plan to address and expand upon recommendations from the risk assessment. The recommendations focused primarily on data and network security, project prioritization and disaster recovery. By the end of this calendar year, all action items in the plan will have been addressed, however, this is an ongoing process. Due to constantly evolving technologies, and the ease with which we share data, we must continue to assess both internal and external risks, and develop new approaches to mitigate those risks on an ongoing basis.

A primary goal in business continuity planning is providing redundancy for critical College systems and services. As mentioned previously, we have already moved a number of our key services to the cloud, including Google Apps for email, and hosted Sakai for our LMS. In addition to freeing up funds for academic support, this strategy has also vastly improved our ability to provide reliable business continuity and timely disaster recovery services. Because of their scalability, these hosted solutions are able to provide exceptional security, more reliable access to data 24x7, and with data backed up on multiple servers, instant data recovery. Our desire in the long run is to move as many operations as is practical outside the campus, resulting in substantial net savings to the College. Our plan to move the data center from the Science Center to an offsite facility in December, thereby releasing that valuable space for use by the academic departments, is a major step in that direction.

Resources Required

Cloud Solution

Challenges
- Funding is required

Partners
- Faculty
- Administrative Staff

It is also establishes redundancy for our critical systems and infrastructure, a key component of our business continuity plan. By moving to the colocation site, we can expand our data center without increased power and HVAC consumption here at the College. In addition, because their facilities provide continuous power, climate control and security it will enable us to have nearly zero down-time due to infrastructure instability. Ideally we would take this same action with our Green Hall Data Center, provided appropriate funding.

## Risk Management: Striking the Balance with Greater Access

Limiting Access to Protect Confidential Data

Improved data security; limiting access to secure data; minimized data loss; compliance with state and federal laws

In accordance with federal and state laws and regulations, Wellesley College is required to take measures to safeguard personally identifiable information (PII). LTS has implemented a comprehensive information security program, in compliance with Massachusetts law, designed to safeguard all sensitive data maintained at the College. This program includes reducing access to PII in its administrative systems and implementing a set of policies to protect confidential College data. This Fall we are rolling out an online mandatory security education program for all employees who have access PII. We will continue to update our security program and online education as necessary to reflect changing legislation requirements related to information security.

The College is required by Massachusetts law to provide notice about security breaches of protected information at the College to affected individuals and appropriate state agencies. In compliance with this law, we have developed an Incident Response Plan to ensure consistency in all aspects of the College's response to a breach. The College is convening an Incident Response Team, and the CIO and Information Security Officer will play key roles on this team. We use a number of tools to detect and prevent breaches, including firewalls, Clean Access, and a network sniffer tool, but these are not enough to keep up with the ongoing threat presented by hackers. Therefore, we plan to implement an intrusion detection/protection system so that we are better equipped to identify a threat as soon as it occurs to minimize potential data loss. Also, we will need to continually test and update our incident response procedures in order to be prepared in the event a breach occurs.

Resources Required
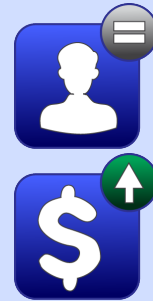
Cloud Solution

Challenges
- Employee understanding of individual role in safeguarding data

Partners
- Division heads and senior administrators
- Finance office and Chief of Police
- Provost's Office
- Payroll, Human Resources, Registrar's Office

We have conducted initial internal and external penetration tests on our network, and going forward, we will need to continually reassess the risks to our network through annual penetration testing, which will require ongoing funding to support this work. We have implemented an initial set of requirements for web application development to secure our web applications. This is an area that needs constant attention because of the rapid pace at which technologies in these areas change, so we are committed to revising these standards on an ongoing basis.

A crucial component of data security is limiting access to confidential data. The Wellesley Identity Management (WIDM) Project is a huge step in that direction. LTS is working collaboratively with a team of functional users from the Provost's Office (representing Faculty Identities), Payroll and Human Resources (representing Staff/Employee Identities) and the Registrar's Office (representing Student Identities) to develop a process for the creation and deletion of these constituent identities. Hand in hand with this work, we are identifying roles common to groups of these constituents and then assigning systems and applications required by these roles. The technical members of the team are developing a flexible architecture which will allow for the creation of new roles at any time and which can be added to or plugged into the existing structure. The primary goals of this work are: 1) to reduce risk by deleting identities as soon as they are no longer required, 2) to develop a simple architecture that is easy to maintain and modify, and 3) put control of these identities into the functional offices who have the knowledge to better understand and control these identities.

Conclusion

We are thankful for the active participation by many community members in helping us shape the strategic direction for LTS. This plan calls for bold actions to move LTS to be a strategic partner in almost all areas of the College and help the College be recognized as a leader in adopting the changes in both the Library and Technologies to its core academic mission. LTS staff are energized and ready to move forward as demonstrated by some of the recent successes.

We understand that in the current and near term financial environment, it is unrealistic to try to launch many of these initiatives with the assumption that there will be new funding. Therefore, though we have not attached specific budgets to the initiatives above, we are confident that many of these will be accomplished by reorganizing our current personnel and financial resources. We believe that many of these initiatives will also be very attractive to the alumnae and therefore can become fundraising priority.