
A Strategic Plan for Furman University Information Technology

“...providing the campus community with a digital information environment that reflects and advances the high quality of Furman’s academic program and physical campus.”

March 29, 2011



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Executive Summary

Over the next five years Furman University will provide the campus community with a digital information environment that reflects and advances the high quality of its academic program and physical campus. The following initiatives will help the University achieve this vision.

1. Establish a new *IT Service Center* as the nexus of technology support excellence.

- Orient the information technology organization to focus on excellent customer service.
- Provide proactive and understandable communications about information services.
- Work with Human Resources, the Dean of Faculty, and Student Life to provide improved technology training opportunities for students, faculty, and staff.
- Stretch to achieve strategic goals with finite resources; add resources wisely.

2. Champion scalable information technology *innovations* and best practices.

- Focus on developing innovations, and adopting best practices, for improving teaching and learning with information technology across the academic enterprise.
- Install virtual computing labs and infrastructure to increase flexibility and reduce costs.
- Enable efficient operations using appropriate vendor, cloud, and open source solutions.
- Investigate creating a vendor-sponsored campus “learning innovations center.”

3. Improve *enterprise information systems* functionality and usability.

- Provide enhanced support for the University’s admission and enrollment strategic goals.
- Work with Marketing and Public Relations to develop a collaborative content strategy for the University website, portal, email, social network, file-storage, and other needs.
- Simplify access to university systems; provide mobile applications as appropriate.

4. Establish a state-of-the art system and processes for *digital media distribution*.

- Provide state-of-the-art video conferencing, Internet video streaming, and HD video capabilities to enhance the classroom experience and enable a variety of presentation and collaboration opportunities.
- Establish a multi-purpose digital signage system for department and University information at selected locations; include touch-screen capabilities as needed.

5. Provide a robust, consistent, and reliable *campus network infrastructure*.

- Replace and expand the campus wireless network to provide wireless service for all campus buildings and student residences.
- Redesign and upgrade the campus network for enhanced reliability and Internet capacity; prepare to unify voice, video, and data communications using the campus network.
- Enhance protection of University information resources and operations.

Achieving a Vision of Information Technology Service Excellence

At the Spring 2010 meeting of the Furman Board of Trustees, a number of Furman students discussed the need to improve the Furman campus wireless network. In a follow-up conversation, trustee Robert Buckman suggested looking at an organization's use of information technology as on the following continuum:

Communication > Collaboration > Innovation > Speed of Innovation¹

This "information technology continuum" is a framework we can use to describe how Furman will achieve a vision of technology excellence. The campus network is the foundation on which we build and enhance digital **communication** services. A unified digital content and information systems strategy will provide a platform that will further enhance **collaboration** throughout the University. More communication and collaboration begets **innovation** borne of shared ideas and opportunities. As we create a more flexible foundation for innovation, we create efficiencies that will move us at a greater **speed** towards the next frontier of innovation.

Using the information technology continuum as a guide, and a five-year planning horizon, we've worked with the Information Technology Advisory Council, the Academic Computing Committee, and other campus groups to consider questions such as these:

- Knowing resources are limited, what technology investments should the University make to be better positioned for its long term success?
- What internal barriers do we need to overcome?
- How should we best organize information technology staffing resources to address our strategic goals while also enabling efficient and effective operations?

We've also examined data from campus technology surveys, conducted focus groups, and noted a recent Paladin editorial (Appendix C.) Based on this feedback, and our analysis of the various technology opportunities, we propose these broad information technology strategic goals:

1. Establish a new IT Service Center as the nexus of *technology support excellence*.

Furman has high aspirations for its information technology services, but its IT staff is stretched far more than most of its peers (see Appendix B.) This goal recommends a new name for the division (Information Technology Services), a **reorganization creating a new Service Center department**, and **adding staff** to address projects and service improvements needed in the next five years. The quality of technology services will improve when we deliver technology services consistently, are proactive with our communications, and provide services that increase collaboration opportunities.² In addition to **improving training** for students, faculty and staff, we will train IT staff to use IT service management best practices, and measure our progress toward achieving our vision of **technology excellence**.

2. Champion scalable information technology *innovations and best practices*.

If innovation truly is "born in the gap between resources and aspirations,"³ Furman has much room to innovate. We will focus much of our efforts to encourage and support **scalable innovations**, and best practices, for teaching and learning with information technology. While there are many possible innovative technologies, perhaps no other technology has the potential to scale to broadly support instruction, and reduce costs, than desktop computer **virtualization**. We expect virtualization, and appropriate **cloud sourcing** strategies, to create flexibility and efficiencies to drive more innovations. We will also work with vendors to explore how new technologies could spur further scalable innovations, and we will investigate vendor interest in establishing and supporting a future state-of-the-art "**learning innovation center**" on Furman's campus.

3. Improve *enterprise information systems* functionality and usability.

While the University has a rich set of information resources, we have too often added these resources as digital information silos rather than as part of a comprehensive **enterprise information system**. We will work with Marketing and Public Relations, and campus technology governance, to develop a collaborative **digital content strategy** for the University website, portal, email, social network, and file-storage needs. This digital content strategy will address the **usability** and utility of campus, and personal, digital information tools. We will also work to improve the university's **enrollment systems** and other strategic systems needs.

4. Establish a state-of-the art system and processes for *digital media distribution*.

Furman is a leader in providing engaged learning for undergraduate liberal arts education. In order to maintain this leadership, the university needs digital capabilities that better support collaboration. Important enablers will be a **media distribution strategy** that supports state-of-the-art **videoconference systems**, **HD video** distribution, and **digital signs** and kiosks.

5. Provide a robust, consistent, and reliable *campus network infrastructure*.

Digital communication is now one of the cornerstones of 21st century higher education. This strategic goal recognizes that the University needs to leverage a strong communications infrastructure to improve collaboration and innovation. A renewed and expanded **wireless network** is the first step in improving network infrastructure. **Additional Internet capacity** and **network improvements** will provide a reliable and secure backbone for our technology vision.

Conclusion

Using comments and advice from our community, and a framework suggested by Furman trustee Robert Buckman, we have created five strategic technology goals for the next five years. These broad goals present a framework for achieving a vision where Furman's information environment reflects the high quality of its academic program and physical campus.

1. Establish a new **IT Service Center** as the nexus of technology support excellence.
2. Champion scalable information technology **innovations** and best practices.
3. Improve **enterprise information systems** functionality and usability.
4. Establish a state-of-the art system and processes for **digital media distribution**.
5. Provide a robust, consistent, and reliable **campus network infrastructure**.

These five goals address strategic projects and an organization structure to deliver high quality campus information services. By improving communications, collaboration, and innovation, Furman will be better positioned to achieve the aspirations of its new University strategic plan.

Appendices

A. IT service assessment peer group comparisons

A comparison of Furman 2010 Techqual survey results with result from other institutions grouped by Carnegie classification.

B. Peer comparisons: EDUCAUSE Coredata survey results

Selects relevant data from the 2009 EDUCAUSE Coredata survey from institutions that are members of NITLE, the National Institute for Technology in Liberal Education.

C. The Paladin editorial: “Fragmentation and Technology Strategy at Furman”

This editorial, from November 5, 2010, describes the need for a unified content strategy for Furman’s web presence, portal, and other shared campus information tools.

D. Impact of a Furman virtual desktop and virtual application initiative

Describes Furman desktop and laptop inventory, and how a virtual desktop/application initiative would help instruction, improve computer support, and alter computer replacement funding.

E. Media Distribution Strategy

Discusses a strategy for moving forward with videoconference systems, digital signage, and distribution of HD TV content over the campus network.

F. Furman’s Information Technology Services Model

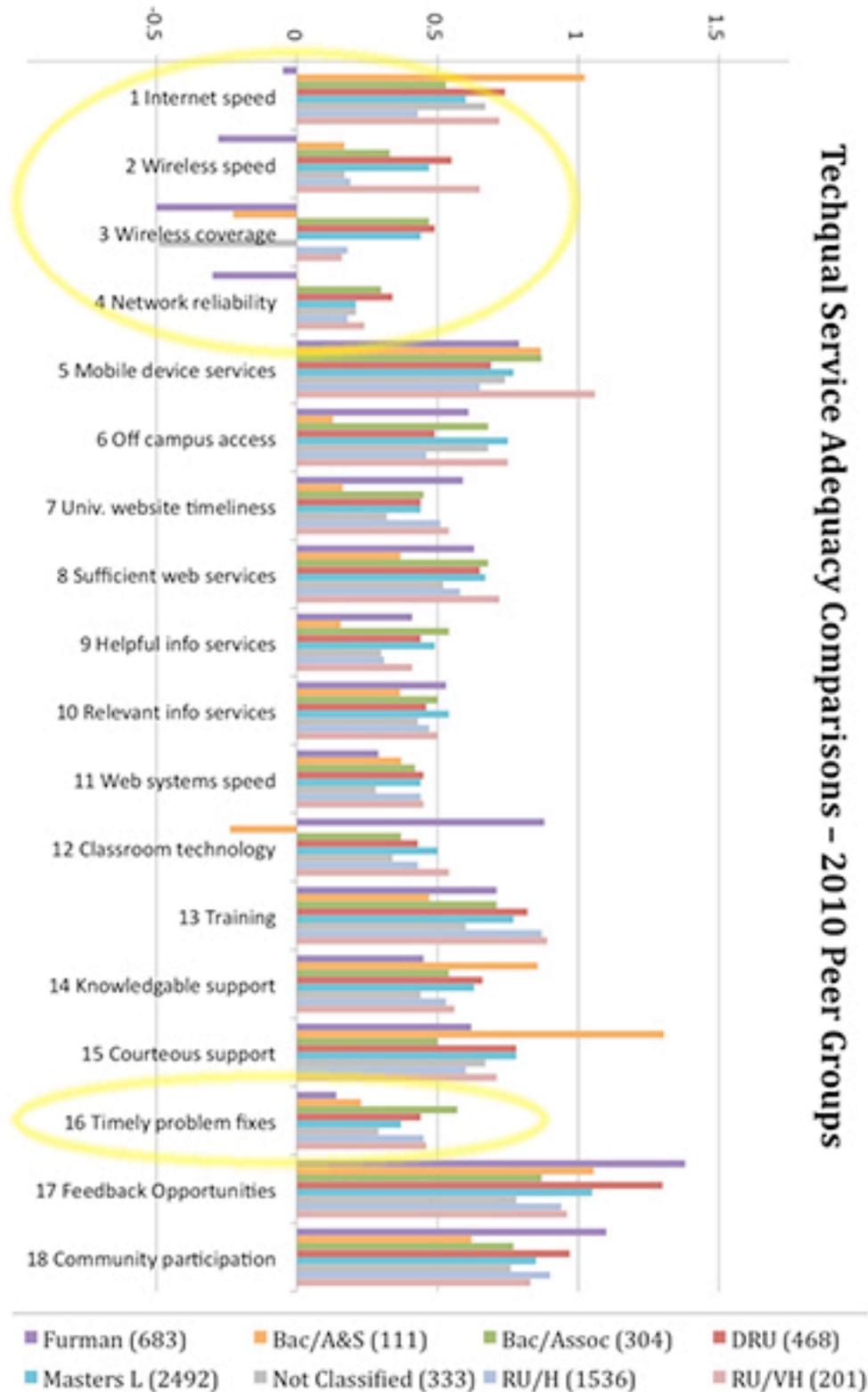
Illustrates the theory guiding our IT staffing reorganization.

G. The Learning Innovations Center

Describes a vision for a new facility to explore information technology innovations in support of teaching and learning in the liberal arts.

A. IT service assessment peer comparisons⁴

This chart shows the relative perceived “adequacy” of Furman’s technology services with purple bars. Circles highlight where the Furman community perceives technology services to be particularly weak.



Peer Comparison Details

The Techqual Peer Comparison chart shows Furman's adequacy ratings on the 2010 Techqual survey compared to responses from other institutions. Other institutions' results are grouped into peer groups. The Techqual project assigns institutions to peer groups. The peer groups shown are defined as follows:

Bac/A&S	Baccalaureate Colleges, Arts and Sciences (excluding Furman responses)
Bac/Assoc.	Baccalaureate/Associate's Colleges
DRU	Doctoral/Research Universities
Masters L	Master's Colleges and Universities (larger programs)
Not Classified	
RU/H	Research Universities (high research activity)
RU/VH	Research Universities (very high research activity)

This chart shows adequacy as the difference between minimum and perceived service level (rated on a 9 point scale.) Numbers of responses from each peer group are shown in parentheses.



B. Peer Comparisons: EDUCAUSE Coredata Survey

This section of the IT Strategic Plan includes information derived from the EDUCAUSE 2009 Coredata survey. EDUCAUSE considers this information confidential and only to be used for institutional planning purposes. This appendix has been removed from the public version of this plan.



C. The Paladin editorial: “Fragmentation and Technology Strategy at Furman”⁵

Numerous technology-related improvements have been unveiled on campus in the recent months. A new Furman University homepage went live at the beginning of the fall semester. A Furman social networking site has also started gaining traction as a way for students, faculty, staff and alumni to connect with each other. During the past week, a plan for the total overhaul of the campus wireless network has been approved by the Furman Board of Trustees and will be implemented over the course of the next year. Major events on campus such as the recent presidential inauguration have even featured live video streams broadcast via the Internet.

While each of these improvements is commendable and impressive in its own right, collectively they are the bright spots in an otherwise incoherent technology strategy on campus. The new homepage is itself a representation of this fragmentation. Instead of a single portal through which to access the Furman website, users are automatically redirected to either an external or internal site based on where they are accessing the site. Prospective students and parents accessing the URL <www.furman.edu> from off campus are sent to <www2.furman.edu>, the external page that serves up relevant information about admissions, campus life, academics, and recent events.

Students, faculty and staff who access <www.furman.edu> while on campus are instead sent to <community.furman.edu>, the internal portal for the new social networking site. All of the same information is available from both sites, but drastically different layouts make information gathering more akin to a scavenger hunt. In addition, users may be sent to either external or the internal site depending on the link clicked – all with the predictability of a fickle, small child. It becomes difficult to find information unless users already know where to go.

Furthermore, additional resources listed on the external page are no-where to be found on the internal page. Students, faculty and staff who might actually find Twitter updates and videos from Furman's YouTube channel useful, have no way of knowing that those sources of information exist unless they explicitly seek out the external site.

The fragmentation that exists on the Furman homepage(s) extends across campus. For course management, students and faculty must use Moodle, a platform that is still playing catch-up with the version of Blackboard it replaced over three years ago. For course registration, there is the trifecta of ARMS, WebAdvisor, and MyFurman – they seem to be inter-changeable with one another, but if that's the case, why the separate redundant names?

Of course, for this multitude of platforms and websites, there are separate usernames and passwords. The addition of a self-serve password recovery kiosk at the technology Help Desk is a testament enough to the difficulty of remembering a different set of login credentials for the bevy of platforms students, faculty and staff must use.

The fragmentary nature and difficulty in using all of these platforms has forced the widespread reliance on a (relatively) ancient technology: e-mail. Professors send PDFs of articles to students via email, students keep up with news via e-mail conferences, students get bulletins from administrators via email, etc.

This in itself would not be an awful option. However, the 50MB storage limit on each e-mail account handicaps this method as a viable alternative to other platforms. A single PDF document may frequently require several MBs of space. In an effort to reclaim space and to maintain an open inbox, all users must engage in e-mail triage: what's most important can stay, but everything else must go.

With the flood of information directed towards e-mail inboxes due to the reluctance to utilize other technological platforms, there is simply no way to store potentially meaningful bits of information for extended periods of time without compromising the ability to receive current information.

While improvements to the campus wireless network may improve the ability of students, faculty and staff to access sources of information, it does no good if the information itself cannot be found once those sources are reached. Without a coherent strategy that streamlines, simplifies and modernizes all elements of technology on campus (not merely just infrastructure), students and faculty will forever be doomed to the frustration of fragmented islands of technology.



D. Impact of a Furman virtual desktop and virtual application initiative

About virtual desktops and virtual applications

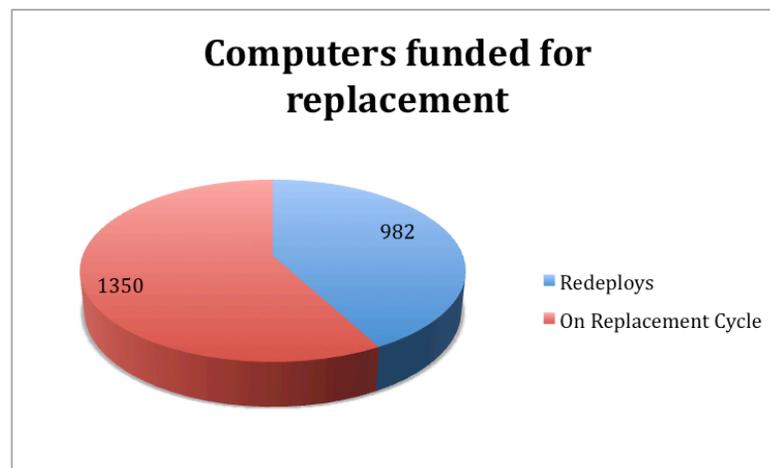
Virtual desktop computing and virtual applications offer the promise of profoundly altering how the University supports computers for instruction and administration. Furman has made good progress and achieved cost savings using virtual servers. We propose expanding our use of virtualization for campus desktop computers and laptops. Virtualization offers the promise of enabling faculty experimentation and innovation, wider access to software for students, and more efficient and effective use of our technology support resources. This virtualization strategy will build on our success with server virtualization, and position Furman as a technology leader rather than a follower.

Some facts about Furman’s desktop and laptop computer inventory

As of October 2010, Furman University owns 2332 desktop or laptop computers. In our current model, Furman maintains two classes of computers:

- Those budgeted for replacement on a planned 3 or 4 year life cycle, and
- Computers that continue to be used after they have passed their planned life cycle (a.k.a., “redeploys.”)

The replacement cycle/redeploy model presents some challenges for funding and support, especially considering the relatively large numbers of computers owned by Furman.



The virtual computer lab

A recent EDUCAUSE Review article described the benefits of desktop and application virtualization: “...computing labs on campuses command a significant percentage of academic IT budgets, both in materials and in labor expenditures. Given the current economic climate, this cost is driving intensive scrutiny of the role of and need for these labs. Student ownership is limited with respect to costly high-end software applications — those requiring high-end hardware or major technical support. For these applications, specialized campus labs will still be needed. But the general-function labs providing less-demanding applications come into question. The installation and upkeep costs, in combination with the current configuration of the labs (e.g., refreshing relatively powerful desktop computers on a three-to-four-year cycle), take dollars and human energy away from other academic pursuits.”⁶

While virtualization is a solution for computer labs, we also see it as way to stretch the useful life of older computers, and provide new capabilities for devices such as the Apple iPad. For example, with a virtual desktop solution, a Windows XP computer, Macintosh, or even an iPad, could run Windows 7 software.

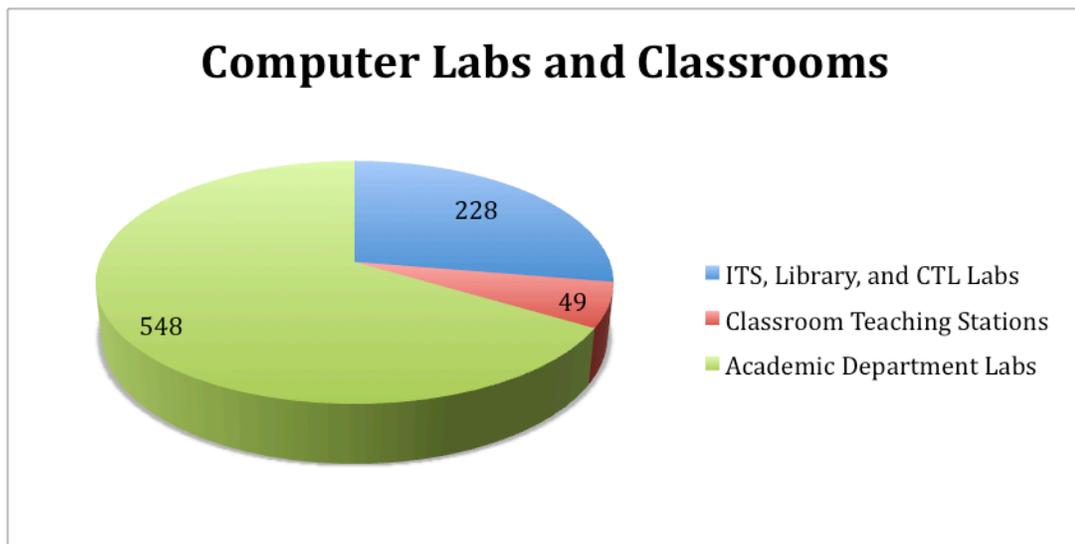
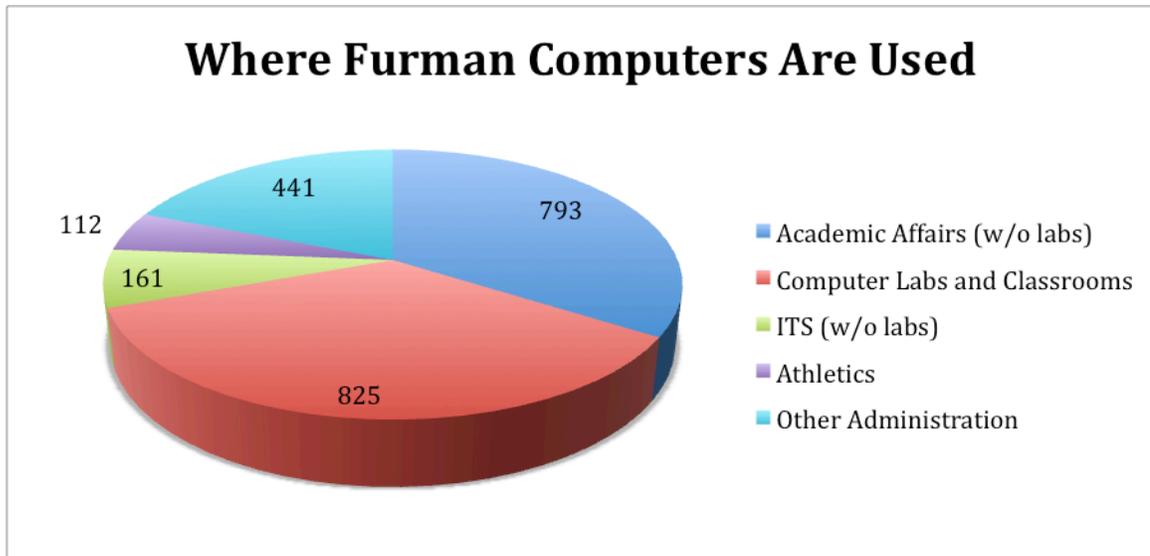
Improving computer support

Virtual desktops and applications will add flexibility for teaching and learning. Another recent EDUCAUSE Quarterly article describes how virtualization improves faculty innovation and technology support at North Carolina Central University:

“Rather than create one computer image that everyone uses, the IT department can create various images on the [Virtual Computer Lab] that meet a wide variety of needs. Professors can request images for use in one or more classes and easily ask for updates. Students have ready access to the images that contain the software they need. All this is available with basic Internet access.”⁷

Changing computer replacement funding

The use of virtual desktops and virtual applications will help us provide better technology support for teaching, learning, and administration. It will also change how we budget for computer replacements. We will save by extending the use of older computers, and we will have less need for so many lab computers. While there will be costs for servers, storage, and support, we do expect to see savings while enabling increased faculty innovations, improve software support for students, and more flexible software solutions.



E. Digital Media Distribution Strategy⁸

Background

Furman distributes media to its constituencies in a variety of ways: telephones, cable television, signage, desktop software, e-mail, Internet video, and many others. As our reliance on the campus network for such tasks increases, we need to consider a comprehensive plan for the future of digital media distribution at Furman.

Current Scenario

- President Smolla has demonstrated a need for state-of-the-art videoconferencing systems for the campus.
- A pilot digital signage project in the University Center has prompted further consideration of additional digital signage for the campus.
- The impact of Internet video, from both on and off campus, presents challenges for our campus network.
- Vendors of HD television, digital signage and videoconferencing systems each propose to offer several of these services with economies of pricing from bundled services and systems.

Additional Considerations

Furman has a small number of “legacy” videoconference systems that are primarily used by faculty to collaborate with other institutions. Our system is limited to point-to-point communications with similar systems. When we need to connect more than two locations, we must use someone else’s videoconference “bridge”. A state-of-the art video conferencing system would include videoconference bridging, provide HD video capability, and inter-operate with desktop videoconferences (i.e., “Skype” style videoconferencing.) We have also experimented with an innovative use of our videoconference systems by relaying a videoconference to an Internet video stream (e.g., the “Constitution Day” and “Civility in Public Discourse” events.)

A digital signage system provides announcements, wayfinding, schedules, notifications and the like. This type of system may work with current Furman systems to distribute permissions to update and modify content for local and campus information. Digital signs may be compact or large and bright enough for outdoor viewing. Content updating and storage may be hosted by a vendor or managed in-house. A digital signage system would include digital video capabilities, and could be used in conjunction with video broadcast from a digital video system.

Rather than attempt to tie together standalone products that address single functions, we should consider an integrated digital media distribution system. Questions we would want such a solution to address include the following:

- Will the infrastructure to meet the objectives of state-of-the-art videoconferencing sufficiently overlap with digital signage requirements to reduce the number of physical devices required to meet both objectives?
- Do we want the signage system to double as video delivery systems?
- What level of interactivity is desirable for digital signage?
- Would distributing HD video over the network make our current cable TV system obsolete?
- How would such a media distribution system work with a possible future classroom lecture capture system?

Conclusion

Any individual digital media delivery system must be considered as a part of an overall, unified strategy for the university. The interrelationships of videoconferencing, digital signage, and HD video distribution cannot be ignored as we seek to provide state-of-the-art electronic resources at a reasonable cost. The interrelationships are clear as vendors from each of these areas seek to “bundle” systems and services for the others. We expect a unified digital media distribution strategy would provide:

- a solution for videoconferencing, digital signage, Internet video streaming, and HD video distribution;
- lower costs than individual solutions purchased separately; and
- simpler processes for processing, distributing, and maintaining our digital media.

A unified digital media distribution system would aid communication, foster collaboration, and provide a platform for digital innovations in support of teaching, learning, and administration.



“Civility in Public Discourse” presentation, October 21, 2010

F. Furman's Information Technology Services Model

The Information Technology Services Model⁹

For many years Furman University used an organizational model that corresponds to a model described as the "User's View of IT Services" model. This model presents information technology services from the perspective of someone using a networked environment. It provided an organization structure that presents technology services as a series of inter-dependant support layers as follows:

Support Layers	Former C&IS Department Names
Desktop Support	Client Services
Shared Applications	Administrative Systems
Server Administration and Network Services	Systems and Technology

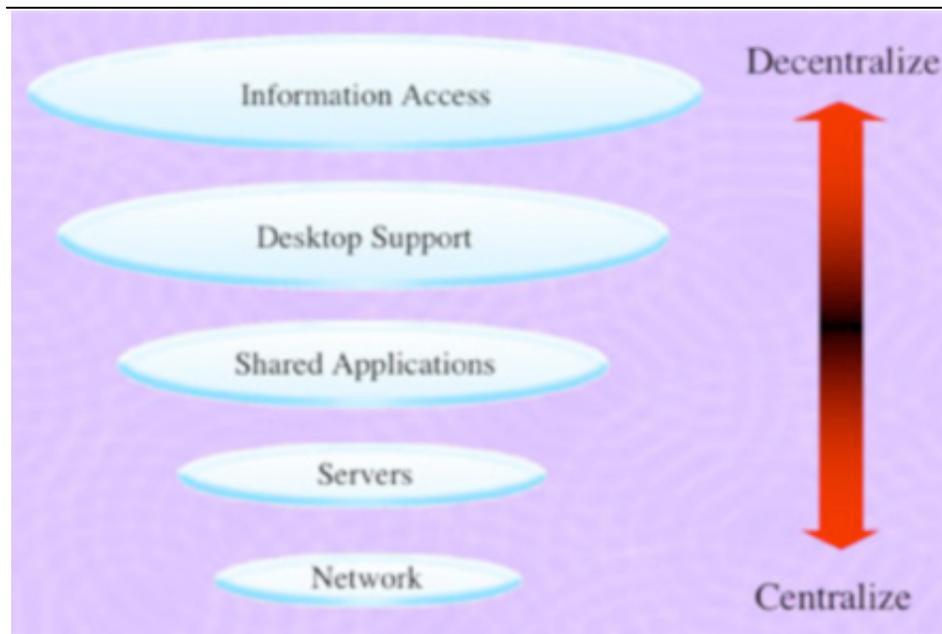
With this model, institutions organize technology staff to support the users' use of information. In the top layer, the desktop equipment must function before the user's information work can happen. Once the local environment is working, a user can think about the next layer - working with applications shared with others. On campus, shared applications typically include administrative systems, library catalog and circulation applications, and the learning management system. The user may know that these applications run on servers (another layer), and that someone has to manage these servers. And finally, the user knows that the institution's network (the bottom layer) ties all of the services together. With this "User's View of IT" model, each layer can be seen as a separate function, but each of these functions depends on the other layers to deliver information services.

What this model does not address is all the other information professionals outside the central technology organization who help others use information resources on campus. These "information intermediaries" include librarians and faculty development professionals, as well as staff working in administrative departments who help others retrieve information from various systems on campus. These people may not be part of the university's formal information technology organization structure, but they communicate regularly with other technology users and with the university's technology organization.

To recognize the importance of these information intermediaries, we need to modify our model. We can do this simply by adding a top layer to represent the people who help others use an institution's information resources. We can call this layer "Information Access". The layers of this new support model can be described as follows, with corresponding proposed new department titles noted:

Support Layer	New Information Technology Services Department Names
Information Access	Learning Technology Services
Desktop Support	IT Service Center
Shared Applications	Enterprise Information Systems
Server Administration and Network Services	Systems and Networks

The revised organization model illustrates that, like the underlying technologies, there are information professionals that must work together to provide information services. This new Information Technology Services model recognizes that users have varying degrees of knowledge about an institution's information technology services. It also recognizes that while most information technology services are centralized, there is a role for decentralized support for information access.



This diagram is a representation of our new Information Technology Services (ITS) model. Survey data shows that nearly all higher education institutions have centralized support for their network. Most liberal arts institutions centralize all but the “information access” layers of the model. Doctoral institutions tend to decentralize the most. Security and server virtualization projects have driven institutions toward more centralized server support.

Centralized and decentralized technology support at Furman

Like most of our peer institutions, information technology services are mostly centralized at Furman. Most decentralization is within the information access layer of the model, and isolated cases of decentralized support provided for other layers.

Furman’s most visible decentralized technology support is help with information access. While central ITS staff support access to instructional technologies and provide technology training, other areas also provide significant decentralized support for information access. This includes librarians helping people access digital information resources, as well as faculty development using information technologies performed by staff of the Center for Teaching and Learning (CTL). We coordinate decentralized support for information access using a variety of methods including weekly meetings of our instructional technology projects workgroup (consisting of representatives from ITS, the library, and CTL), and semi-annual “liaison” meetings with academic and administrative department personnel most involved with supporting their department’s information access.

Strengthening support and coordination with the University’s central ITS staff and its decentralized information professionals will be key to fostering the communication, collaboration and innovations needed to achieve our vision of technology excellence.

G. The Learning Innovations Center

One of the successes of Furman's previous IT strategic plan was to create a set of standards for the University's classroom technology. Now that we have standard classroom technology faculty can walk into almost any classroom on campus and be confident that they know how to use the equipment. Survey data shows that Furman classroom technology is one of Furman's strengths.¹⁰ We envision a new center for exploring innovative technologies, and how such new technologies can aid teach and learning in the liberal arts. This new technology center will build on Furman's strength with classroom technologies, and provide capabilities to test, train, and speed the adoption of successful technology innovations.

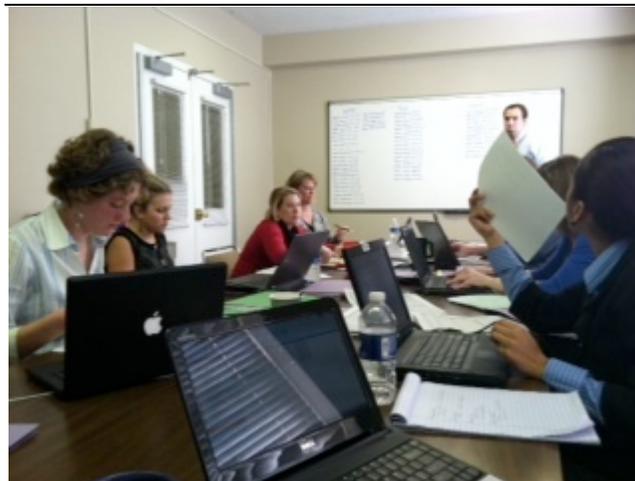
While we now have standard classroom technology, and budgets to support and maintain our existing equipment, new innovations create questions such as:

- "Which innovative technologies help with teaching and learning for the liberal arts?"
- "Where should we best test and explore new technologies on campus?"
- "How do we assess the effectiveness of technologies before deploying them widely?"

Exploring new technologies in support of teaching and learning presents an opportunity for Furman faculty to collaborate with support professionals from ITS, CTL, and the Library. New technologies that have the potential for providing innovative ways to improve teaching and learning include:

- Virtual desktop and virtual applications,
- Videoconferencing and "telepresence",
- Automated presentation media streaming and recording,
- Touch screen capabilities,
- Tablet computers and e-readers,
- 3-D video applications,
- cloud sourcing,
- and more.

Using the Shi Center for Sustainability as a model, we recommend that the University explore designating an area on campus as the focus for this collaboration: a Learning Innovation Center. Such a center will provide a showcase for innovate technologies, and also provide ways to build vendor partnership and explore opportunities. This learning innovation center will allow Furman faculty to explore how information technology innovations can improve teaching and learning in the liberal arts environment, and speed the University's deployment of new information technologies in support of our teaching and learning mission.





¹ Private email from Robert Buckman to Fred Miller, 4/24/2010.

² Chester, Timothy, “Higher Education Techqual+ Protocol Guide”, August 14, 2010, p. 14. Accessed from http://www.techqual.org/techqual_protocol_guide.pdf

³ Hamel, Gary, “Reinventing Management for a Networked World”, keynote presentation at EDUCAUSE 2010, Anaheim, CA, October 13, 2010.

⁴ Data based on Furman Techqual surveys conducted in October and November of 2010, and peer data available to institutions who participate in the Techqual project. For more information see <http://www.techqual.org>

⁵ Hwang, Andrew, “Fragmentation and Technology Strategy at Furman”, The Paladin, November 5, 2010, p. 2.

⁶ Stein, Sarah, and Schaffer, Henry, “Cloud with a Long Tail: The VCL in Support of Pedagogy”, EDUCAUSE Review, V. 45, No. 3, 2010, accessed from <http://www.educause.edu/EDUCAUSE+Review/EDUCAUSEReviewMagazineVolume45/CloudwithaLongTailTheVCLinSupp/205506>

⁷ Murphy, Marianne, “Instructional Benefits of Remote Desktop Virtualization”, EDUCAUSE Quarterly, V. 33, No. 2, 2010, accessed from <http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVolum/InstructionalBenefitsofRemoteD/206546>

⁸ Adapted from a draft prepared by Susan Dunnivant, December 7, 2010.

⁹ The “Information Technology Services Model” is derived from “Information Resources Model” described in: Miller, Fredrick, “Organizing Information Professionals on Campus”, EDUCAUSE Quarterly, V. 25, No. 4, 2002. accessed from <http://net.educause.edu/ir/library/pdf/eqm0247.pdf>

¹⁰ Furman Techqual Survey analysis reports available at <http://www2.furman.edu/sites/ITS/About/Pages/ITSReports.aspx>