Fall 2010

ACUTA Journal of Telecommunications in Higher Education

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<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall Seminar</td>
<td>October 24–27, 2010</td>
<td>Sheraton Premiere at Tysons Corner Vienna, VA / Metro DC</td>
</tr>
<tr>
<td>Winter Seminar</td>
<td>January 9–12, 2011</td>
<td>Pointe Hilton at Tapatio Cliffs Phoenix, Arizona</td>
</tr>
<tr>
<td>Annual Conference</td>
<td>April 3–6, 2011</td>
<td>Hilton Bonnet Creek Orlando, Florida</td>
</tr>
<tr>
<td>Summer Seminar</td>
<td>July 17–20, 2011</td>
<td>Hyatt Regency Baltimore, Maryland</td>
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ACUTA’s Core Purpose is to support higher education information communications technology professionals in contributing to the achievement of the strategic mission of their institutions.

ACUTA’s Core Values are:

- Encouraging and facilitating networking and the sharing of resources
- Exhibiting respect for the expression of individual opinions and solutions
- Fulfilling a commitment to professional development and growth
- Advocating the strategic value of information communications technologies in higher education
- Encouraging volunteerism and individual contribution of members
CONTENTS

FEATURES

12
Trend Tracker
Bridget McCrea
McCrea identifies 8 top technology trends to watch in higher education this year, including interactive classrooms, cloud computing, technology as a cost cutter, and more.

30
What Do Students Want?
Elwin J. McKellar
What do students want now, and what will they be expecting in the near future? We asked ACUTA members at Rowan University, Rutgers University, and Ball State University to share their insights and experiences.

16
Future Web Apps: Reinventing the Nature of Higher Education
Joe Dysart
Dysart examines the comments of an educational technology consultant relevant to the impact of recent innovations on higher education.

33
Institutional Excellence Award
University of Pennsylvania
The University of Pennsylvania won ACUTA's prestigious Award for their PennNet Phone Project. Mike Palladino shares details of how they made this happen.

23
Security Is High Priority at Ohio State
Curt Harler
Ohio State has developed some impressive video security measures that will make students and parents feel more confident about security on campus. Harler takes a look at a cutting edge program.

26
Making the Most of Mobile Communications
Paul Korzeniowski
As mobile phones become more capable and mobile technology becomes the norm on campus, ICT will be called upon more often and in new ways to meet user needs. Korzeniowski provides an overview of new directions for mobile technology.

INTERVIEW

19
Mark A. Heckler
President
Valparaiso University

COLUMNS

6
President's Message
Matthew K. Arthur
Washington University in St. Louis

8
From the Executive Director
Jeri A. Semer, CAE

40
Q&A from the CIO
Priscilla Hancock
University of Louisville

ADVERTISERS' INDEX

38
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ResNet just got easier...

Campus Televideo is pleased to announce the acquisition of Xwires Broadband to expand and enhance its ResNet data service offerings.
...[T]he new Web technologies transforming the broader culture—including blogs, wikis, universally available WiFi, and social networking—are all being embraced by higher education in an effort to stay relevant, and in the process, will ultimately change the very nature of education.

Joe Dysart
page 16
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I was recently reading an article discussing the importance (more or less) of the CEO to a business. One thing that struck me as extremely relevant was that middle managers have been unfairly discounted as instruments of change and leadership over the years. As team leaders in a good environment, they are empowered to make their “cog” in the corporate machine work more efficiently and effectively. These achievements are now being highlighted more and more.

Great CEOs learned leadership at the team level and carried it with them to the higher levels of the organization. It seems to me that as we think about the great expectations that come along with the technologies that are constantly evolving and revolutionizing our campuses, one of the best things we can do is to become better managers and leaders. At some point as we climb the professional ladder, we leave behind the day-to-day, deep-dive technology piece of our jobs to focus on managing those who directly support those wires, handsets, and software applications.

That being said, I don’t want to infer that there is no need to remain technically competent as we all continue in our careers as information communications technology professionals. Even though it has been a few years since my “first” retirement, my days as a command sergeant major in the U.S. Army Reserves were filled with the refrain to my fellow soldiers to always be technically and tactically proficient. Those same words carry a parallel meaning for me now. For those soon-to-be and current project managers, customer service team leaders, supervisors, managers, directors, associate CIOs, and so on, it has become painfully clear that in order to continue to grow as professionals, we need to focus as much or more of our time on the non-technical.

In the current issue of Information Security Magazine Online (July/August 2010), an article by Lee Kushner and Mike Murray titled “Do You Have the Intangibles?” discusses how professionals in information security need to combine their technical achievements with knowing what kind of impact their field and technologies have on the company’s core business and how to become better leaders at all levels. (my italics) These levels were listed as team leadership, organizational leadership, and industry leadership. One sentence, in particular, jumped out at me from the article: “We will ultimately need to become better educated on the business issues that our organizations face, and be better prepared to address them within the context of our role and the solutions we offer.” In my mind this applies across the board and even into our “industry” of higher education.

While many vice presidents and CIOs are among the ACUTA membership, the majority of us have one of the titles listed in a paragraph above. Some have come up through the ranks of our institution, and some have come from other industries including the corporate, private, and public spheres. Having earned our technical “chops,” we have found a home in higher education. Where can the soon-to-be managers, supervisors, and others get the training that Kushner and Murray talk about? Where can they learn what they need in order to be better prepared to address the issues that challenge higher education and the information communication technologies that create such great expectations? My answer is ACUTA.

Without question, there is no other higher education association that provides better preparation, education, and professional development. ACUTA ensures that
each of us becomes better at our profession, and that makes us more valuable to our institution. Being able to provide answers to the challenges of today by accessing a network of experience from both our education and corporate members; attending both live and online presentations on topics ranging from becoming better managers to financing IT to green data centers to the latest trends; serving on one of the well-established or new and exciting ACUTA committees; or stepping up to a leadership position within ACUTA by serving as a subcommittee or committee chair, state coordinator, board member, or officer—ACUTA provides these opportunities to learn, network, serve, and make an impact at a national level. This helps to produce confident, talented, well-connected professionals who are better prepared for the challenges that advancement always brings.

As you know, ACUTA has recently removed the restriction on the number of individuals who can be listed from member institutions. To help us grow the ACUTA network, I would ask that you look around not only your department, but throughout your institution for others on your campus who will benefit from the same access that you have to ACUTA resources. Too often the only ones who really understand just how much our organization has grown and changed over the last decade or more are the small number who are listed as members. We need to get the word out on every campus about the benefits ACUTA can provide to help us fulfill the great expectations you’re going to read about in this issue of the Journal.

Visit the website (www.acuta.org) or contact any Board member or the professional staff to learn what opportunities you or someone else on your campus might be missing.
Reach Matt at arthur@wustl.edu.

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Have you ever wondered how your fellow institutions are using social media tools such as Facebook, LinkedIn, Twitter, and others? We did, too, so ACUTA conducted a survey of our institutional members regarding social networking policies and practices at their institutions in February 2010. Our goal was to find out how social media tools are being used by faculty, administration, and students; what are the most popular social networking tools for various purposes; whether anyone is measuring impact or effectiveness; strategies and usage policies; perceived value; and IT department involvement. The survey also inquired about which social networking tools are being used for personal and professional networking.

The survey was developed by the ACUTA Higher Education Advisory Panel and our Social Networking, New Media, and Web Resources Subcommittee. The survey was administered by ACUTA, and the results were compiled and analyzed by Associated Marketing Partners, our market research consultants.

The survey was repeated in March 2010 with registrants for the 2010 Strategic Leadership Forum. The report provided an opportunity to compare responses from the general ACUTA membership and those who self-identified as leaders by registering for the forum. I then had the pleasure of presenting a session and conducting a lively interactive discussion at the Leadership Forum based on the results.

The full survey report, a literature review, and a copy of the PowerPoint presentation are available at www.acuta.org/wcm/acuta/donna2/10conferenceSchedule.pdf. For those who were not able to attend, here is a brief summary of the results. Please note that the terms “social networking (SN)” and “social media” are used interchangeably in the following report.

Strategies and Purposes for Social Media on Campus

When asked if anyone at the university is currently measuring the impact or importance of social networking on campus, one in five institutions reported that measurement of impact/importance is taking place. The survey also asked what methods were being used, but there was no clear methodology in place. This may be an opportunity for best-practice development.

We also asked for a description of the uses of SN on campus. Traditional usage of SN (posting photos, having fun and engaging in leisure activity, sharing info with friends) all scored high. However, in uses that are specific to higher education, recruiting new students is clearly important to both the general membership and leadership groups. Other uses that were mentioned most often by IT leaders included raising issue awareness, organizing support for a cause or charity, and driving traffic to other websites. The general membership group mentioned posting photos/videos and setting up interest group profiles significantly more often.

We also inquired about the “most popular” social networks based on the type of user—faculty, staff, and students. Facebook was the clear leader (35 percent for administrators, 39 percent for faculty, and a whopping 77 percent for students), and we suggest that it should be recognized as such in developing a social networking strategy for the campus. LinkedIn was a distant second for administrators (22 percent) and faculty (8 percent), and none of the other tools scored above 3 percent for any of these groups.

When asked how many faculty members were using SN in connection with teaching and research, 61 percent reported it being used in some manner by faculty. These results are encouraging, but there
is major potential for growth in the use of 
SN for teaching and research. This presents
a prospective opportunity for knowledge 
sharing among faculty.

When asked about student usage of 
SN on their campus, 34 percent said SN 
is being used to improve faculty/student 
interaction, and 33 percent said SN is 
being used to improve interaction among 
students. SN is clearly widely used among 
students and presents a high potential for 
institutions looking to connect with them.

When asked if their campus has a social 
networking strategy, 79 percent responded 
"no," indicating that institutions are just 
beginning to consider strategic uses of SN. 
This may present opportunities to learn 
from those who have adopted SN strategies.

Departmental Uses of Social Networking
The survey asked which departments use 
SN. Results show that it is being used by a 
diverse set of departments. Those receiving 
greatest number of positive responses 
included student life, communications/PR, 
admissions, IT, alumni relations, and athletics. The IT department scored near the 
middle of the pack—41 percent of mem-
bers said that IT uses social media. Interest-
ingly, 56 percent of the leadership group 
said that their IT department uses social 
media.

When asked what the campus hopes to 
improve through the use of SN, the clear 
majority response was communication— 
both on and off campus. A significant per-
centage (25 percent) of campuses also use 
SN to enhance the academic experience. A 
slightly lower percentage (21 percent) use 
SN to improve business operations.

Value of Social Networking to the Campus
We asked how valuable SN will be to the 
campus over time frames of one year, two 
years, and five years. Survey respondents 
are looking at a 2–5 year time frame with 
respect to realizing significant value for 
their institution from SN. In two years, 56 
percent of members rate it 4–5 on a value 
scale of 1–5, and in five years 77 percent 
give it that high a rating.

That said, when asked if the campus has 
an established ROI assessment mechanism 
for the use of SN, 100 percent said no.

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ACUTA members expect Facebook and YouTube to have the greatest increase in role and influence on campus, and they expect MySpace and Flickr to decline. This may have implications for where campuses focus their resources.

Security and Monitoring

The survey also addressed security and monitoring policies related to SN. Very few campuses monitor SN usage by faculty, administrators, or students. Seventy-seven percent of members responded that their institutions do not have rules or policies of use where SN is concerned.

Of those who do have such policies, nearly equal numbers have policies addressing posting videos, posting photos, privacy settings, and restrictions on giving out personal details.

Clearly, policies and rules of conduct for the use of social networking are not the norm. Comments indicate that many policies that do exist are based on Web content policies, which may not be sufficient for SN. This also presents a potential opportunity for sharing best practices.

Despite the widespread absence of usage policies, survey respondents expressed a high degree of concern about the potential for identity theft, financial fraud, and personal safety issues for users of SN on their campuses.

ICT Department’s Role in Supporting Social Networking

The survey also explored the extent to which the campus Information Communications Technology (ICT) department coordinates and/or supports the use of SN across campus. Somewhat surprisingly, ICT is not in a coordinating or supporting role on the majority of campuses. Could this be a missed opportunity for ICT professionals to lead this process, provided with the proper knowledge and best practice information?

Personal and Professional Use of Social Networking Tools

Regarding personal and professional use, Facebook is the predominant tool (85 percent) for personal networking, and LinkedIn (86 percent) is the predominant site for professional networking among survey respondents. At least currently, respondents log in more often for personal use than for professional networking.

The survey also asked about devices that are used for accessing social networking tools. Results show that access is clearly not limited to desktops and laptops. Mobile devices are used by a significant percentage of members. It will be important to keep this in mind when establishing SN strategies and providing tools and training for ICT professionals and other campus SN coordinators.

Conclusions

It is clear that social networking is an application that will be in great demand on tomorrow’s campus. Here are a few conclusions from ACUTA’s 2010 survey that I believe are worthy of your consideration:

- The use of SN tools is already dominant among students and growing among faculty and administration.
- SN is primarily viewed as a communications tool, not yet widely applied in academics or business operations on campus. However, these uses are growing.
- The majority of campuses do not yet have a strategic approach to the use of social media.
- Campuswide policies are not prevalent.
- Coordination and training are needed but not prevalent.
- There is a potential opportunity for more ICT involvement in a leadership and/or support role in the implementation of social media policies and training.

I hope you will give some thought to the results of this survey and what they might mean to your campus. I would welcome your recommendations for ways in which ACUTA can support your development in this important area.

Reach Jeri Semer at jsemer@acuta.org.
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Trend Tracker
Top 8 technology trends to watch in higher education this year

When it comes to educational technology, some investments are largely hit or miss. Well-meaning IT teams and administrators discover a piece of software or equipment that looks promising, fund the buy via grants and/or school budgets, install the technology, and then hope that it will work its magic. Professional development usually helps to boost the odds of that happening, but even the best training in the world can't make up for technology that just doesn't do what it promises.

We'd like to help you balance the scales a bit. With nearly every corner of higher education being affected by technology, we decided to reach out to IT pros and faculty members who have had more hits than misses on their records and who wanted to share their insights into what types of technology should grace your technology agenda now and into 2011.

Here are the top trends that you won't want to ignore:

1. Increasingly Interactive Classrooms

The days when professors lectured to a class of blank, unresponsive faces are gone, having been replaced by more interactive learning environments. Purdue University's Web-based Hotseat application, for example, which allows students to use handheld devices to interact with professors in the classroom environment, is just a taste of what's to come.

The home-built application allows students to comment on the class, and then enables other participants—including professors, students, and teaching assistants—to view those messages. Students either use their Twitter, Facebook, or MySpace accounts to post the messages, or they log into the Hotseat website to send text messages. The application resides on the Web, so there is no software for professors or students to install.

Other colleges are taking similar actions in order to make the classroom setting more tech-oriented and interactive. "Anything that helps make the classroom more animated and engaging—be it multimedia, streaming video, or some other innovation—is in demand right now," says Gregory Phelan, chair of the department of chemistry and associate professor at SUNY College at Cortland in New York, which recently upgraded its facilities to include streaming video that professors can access via the server while teaching.

2. More Information at Students' and Teachers' Fingertips

We live in an era where new information just can't be produced and distributed quickly enough. This phenomenon has created an environment in which traditional, hardcover books, newspapers, and journals simply can't keep up. The college classroom is no exception, with electronic book readers, smart phones, and other devices taking center stage. Students and teachers have everything they need right at their fingertips to take a class discussion global in Anthropology 101, or examine precedents in the law classroom, or challenge engineering students across the country to improve on a design in real time.

Expect this trend to continue at a rapid pace. "This faster access to information is going to change the classroom dynamic," Phelan predicts. "It will affect how lessons are taught and how students do their work." He points to the colleges that distribute
tablet PCs to all freshmen as the frontrunners in the race to equip students with all of the information they need to succeed in school. Whether other universities follow that lead remains to be seen. "I’d really like to see more schools making that move," says Phelan, "and even further integrating technology into the college classroom."


A growing number of institutions are foregoing traditional "purchase and install" software offerings and opting for SaaS (software as a service), or "cloud," options. Also known as on-demand, this delivery method provides access to software and its functions remotely as a Web-based service, thus giving institutions access to business applications at a price typically much lower than what they’d pay for licensed applications (and based on a subscription fee). Because the software is hosted remotely, on-demand also reduces the need for new hardware and the IT resources necessary to handle application installation, setup, and maintenance.

James Reyes, general manager at San Diego–based provider of activity registration and management software ActiveCommunities (a division of the Active Network), says an increasing number of universities are tapping the on-demand trend. "It's been around for a few years now," says Reyes, "but there's definitely more buzz going on about on-demand on campus right now."

Particularly attractive selling points for SaaS applications are their low upfront costs and the fact that they don’t require intensive IT or human resources on the part of the institution. Software updates are also less painful when using on-demand systems, Reyes adds, because they are primarily delivered via the Web on an as-needed basis. "With licensed software, IT staff has to visit each campus department and update the software on each and every desktop, as well as on the school's server," Reyes says. "With cloud computing, those same software updates are simply 'pushed' out to the sites."

4. Technology Seen as a Cost Cutter

Technology is usually looked upon as an expense—a deduction from the bottom line that will hopefully deliver on its ROI promises. Some schools see technology
a little differently, and are using it to cut costs and save valuable time in the difficult economic climate. Expect more institutions to take this stance as budgets continue to tighten and as technology proves itself to be a cost saver.

At Central Pennsylvania College in Summerdale, Pennsylvania, for example, recent measures include monitoring printing across the organization, with the goal of reducing paper and toner usage college-wide. Central Penn is also experimenting with online meeting tools that administrators hope will reduce the need for staff travel between the college’s three locations.

The institution is also considering new technology that will allow it to automatically start up and shut down the 500 computers that it owns and maintains across its three campuses. "If someone turns one of those computers on and lets it run for days, that electricity usage doesn’t benefit anyone," says Steven Birmingham, IT director. "Our goal is to get to a place where those computers will shut down automatically when not in use."

5. Bridging Geographical Gaps with Technology

Videoconferencing, webinars, and online communication tools like Skype have already proven themselves to be a great replacement for on-site meetings, the latter of which require travel time and money to orchestrate. But what happens when a college in New York needs to connect with one that’s based in Texas—or overseas?

SUNY Ulster of New York has the answer. For two years the school has been collaborating with European Humanities University (EHU), a Belarusian university whose mission is to form alliances with other universities to evoke “constructive cooperation.” As part of that mission, the university paired up with SUNY Ulster in 2008 to offer an online course in English as a second language, followed by a similar collaboration in 2009.

According to Hope Windle, an instructional designer at SUNY Ulster, a group of six U.S. students participated in the four-week program with EHU students. To manage the online, international coursework, SUNY and EHU used a combination of Moodle and Google Docs.

"Everyone was able to add documents to the system," says Windle, "but the majority of the communication took place on discussion boards that were organized by topic, with agreed-upon grading rubrics." With the Internet breaking down geographical barriers worldwide, expect to see more universities and colleges forming bonds with institutions around the globe in order to expand their students’ horizons.

6. High Demand for Multitasking Technology

The days when technology vendors came up with single pieces of software designed to handle one task have been replaced by a rush to develop solutions that not only handle myriad projects, but that also integrate well with other technology applications. “Single-minded” technologies will continue to fade into the background over the next 12 months as users learn to “mash up” (a website or application that uses and combines functionality from two or more sources to create new services) their Web2.0 technologies into packages that are more useful and productive.

Credit students with driving this trend. “Students are using every communication vector that they can get their hands on right now,” says Ron Hutchins, associate vice provost for research technology and CTO at Georgia Institute of Technology’s Office of Information Technology. “It just makes sense that they would mash those technologies together and make them more specific and customizable.”

Consider online maps, for example. Once thought of as stand-alone applications that help the user get from point A to point B in the fastest, most efficient manner, online maps can now be integrated into other applications, such as location-based e-mail programs. "These types of customizable, specific mash ups," says Hutchins, "will become even more prevalent in higher education in the future."

7. Technology Being Used to Streamline the Admissions Process

Colleges are using Twitter and Facebook to connect with recruits. They are also relying on streaming video and e-mail to communicate with prospective students, leaving the traditional direct-mail and paper application process in the dust. Institutions are also using tools such as online video to show off their campuses and highlight activities in hopes of enticing top candidates to their campuses.

At Washington College in Chestertown, Maryland, Aundra Weisert, assistant director of admissions, says the push to move the institution’s admissions department into the technology age coincided with the fact that more students were interacting and connecting with each other and with their schools online. “We knew our students do a lot on the Web,” says Weisert, “so we knew we needed to harness its power and start connecting in that way.”

Tufts University in Medford, Massachusetts, recently added an online video option to its application, thus allowing the prospective class of 2014 (and all future classes), to produce its own YouTube.com videos in addition to the two short, written essays traditionally required. Capped at one minute in length, the videos fulfill the institution’s requirement for one additional essay.

8. Technology Devices Embraced on Campus

No longer considered a distraction, mobile devices have become a professor’s best friend at many colleges across the nation. Not only do these devices serve as easy, quick communication tools, but they also
keep students in touch with lessons, assignments, test scores, and other important data and information.

Abilene Christian University (ACU) of Abilene, Texas, is a good example of a college that’s embraced mobile devices as teaching tools. Every year the institution gives out 2,000 iPhones to incoming freshmen and to those existing students who need upgraded devices. The institution, which developed its own Web-based application for iPhones and iPod Touches, was the first university in the nation to provide such media devices to its freshman class.

Early on, the idea was for ACU students to use the handheld gadgets to receive homework alerts, find out where professors’ offices were, check cafeteria account balances, and answer in-class surveys developed by their instructors. The initiative has since grown to include even more capabilities. “We’ve been adding tools and information to our mobile application, which is now in its second version,” says William Rankin, director of education and innovation, and an associate professor of English. “We’re working toward delivering to the whole campus.”

Conclusion

As technology continues to make its way into the college classroom, we’ll likely see even more trends in automation, computing, and social networking emerge as useful tools for students, professors, and administrative departments. There are plenty of examples of how technology is changing the traditional classroom into an interactive learning experience: Purdue, SUNY Cortland and Ulster, ACU, and others mentioned here—as well as others not mentioned, such as Rutgers and its touch-enabled whiteboards. Whether they’re getting the word out about a new initiative via Twitter, installing campuswide WiFi networks, or implementing new software applications, today’s institutions are placing their bets on what has turned out to be a revolutionary era for the college campus. ICT professionals are positioned for leadership in new and exciting ways.

Bridget McCrea is a business and technology writer in Clearwater, FL. She can be reached at bridgetmc@ earthlink.net.
Future Web Apps: Reinventing the Nature of Higher Education

What an education technology consultant says about the future of educational processes

Spurred on by the relentless innovation in Web technology, higher education is currently in the process of reinventing itself, according to Steve Hargadon (www.stevehargadon.com), an educational technology consultant. It's a process that will rely heavily on higher education technology professionals to succeed.

"The advent of the printing press, I think, will in some ways be seen as less revolutionary than Web 2.0," Hargadon says.

Essentially, Hargadon believes the new Web technologies transforming the broader culture—including blogs, wikis, universally available WiFi, and social networking—are all being embraced by higher education in an effort to stay relevant, and in the process, will ultimately change the very nature of education.

Specifically, key emerging technologies that Hargadon and many computer hardware and software manufacturers believe are transforming learning institutions include conversational publishing, collaborative technologies, flat-world technologies, social networking tools, and open systems. Each one deserves a closer look.

Conversational Publishing

"We're already doing it on Amazon.com," says Hargadon, referring to the lively online book review community Amazon.com currently supports on its site.

Given the increasing popularity of these technologies, publishing in higher education is poised to morph from a kind of data download approach to "a conversation," Hargadon says. Amazon.com's Kindle, for example, already allows readers to embed notes and annotations in the text. It is just a short jump from there, he says, to multiple annotations and notes that are simultaneously shared by dozens of readers.

Collaborative Technologies

For Hargadon, the considerable success of collaborative technologies such as Wikipedia (www.wikipedia.com)—the online public encyclopedia that relies on individual posts juried by group consensus to advance the world's storehouse of knowledge—presage the need for similar tools in higher education.

The depth of wisdom derived from a group effort can be "astonishing," Hargadon adds. Simple, technology-aided interactions within a group can yield insights that ordinarily require the expertise of a guru. "I think that historical periods of time favor specific traits," he says, "and this time and place is the age of the collaborator."

University College Sjaelland (www.ucsj.dk), formed from a merger of 18 educational institutions, has already moved to an online collaborative environment, installing a brand new IT system specifically designed to ensure staff and students can interact in significant ways online.

Built on IBM Lotus Quickr and IBM Lotus Sametime, the system leverages NEODashboard, a software solution that enables all users to easily engage with one another using instant messaging, shared workspaces, and discussion forms.
"For the solution to be a success, we needed to get the students to visit their dashboard page everyday," says Michael Jung Falk, a UCSF project manager. "So we wanted it to display whatever content they wanted, instead of just imposing our own content on them." In practice, that means students can easily customize their dashboard with RSS feeds, Google Gadgets, Facebook, Flickr, and more.

Meanwhile, in another collaborative effort, scores of institutions are already taking advantage of iTunes U, a storehouse of more than 250,000 lectures, language lessons, audiobooks, and podcasts sponsored by Apple’s iTunes store.

Contributions come from universities such as Yale, Stanford, UC Berkeley, Oxford, Cambridge, and MIT, as well as from museums such as the New York Museum of Modern Art and broadcasters such as PBS. Professors can use the service to assign content, and students can download offerings one at a time, or subscribe to entire courses, free of charge.

Flat-World Technologies
Many education technology consultants see the concepts in Thomas L. Friedman’s The World Is Flat—in which Friedman argues that technology is responsible for the wholesale elimination of countless barriers between people, classes, and cultures—as a fait accompli, rather than a novel perspective.

“You can now study courses from MIT online,” Hargadon says. "I can sit in a room in San Francisco with a group of educators, and at a moment’s notice, Skype in educators from around the world to talk with us. The world is amazingly flat. And I think it’s a huge benefit to our students. They will have something that we didn’t have growing up that will make education significantly more profound for them.”

Take National LambdaRail (www.nlr.net), a high-speed optical network for advanced research and innovation. LambdaRail recently became the first national research and education network to make its Cisco TelePresence Exchange Services (www.cisco.com/telepresence) available to anyone with access to the national facility.

Essentially, the TelePresence system simplifies spontaneous, face-to-face meetings for staff at a number of learning institutions, including Carnegie Mellon, the University of North Carolina, Indiana University, and the Corporation for Education Networking Initiatives in California.

Other applications of Cisco’s technology on campuses enable students to meet face to face with other students a world away. Branch campuses can share a professor simultaneously. Guest lecturers can become accessible to multiple campuses, and professional schools, such as business, dental, engineering, and other graduate schools, can use the technology to reach out to industry and government experts to bring students real-world insights.

Social Networking Tools
While educators may wince at the thought of embracing social networks like Facebook and MySpace as learning models, Hargadon takes a different view. There are simply too many people who have caught the social

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networking bug for the technology to be ignored, he insists. "The numbers are incredible," Hargadon says. "I think we're going to find it's going to be an enormously effective tool."

Top heavyweights in higher-ed technology agree. Google has been pushing its Google Apps for Education Suite (www.google.com/edu)—a hybrid productivity software and online social network tool—for a number of years now. Besides taking advantage of basic functions such as e-mail, calendaring, and word processing, it also allows college students to use Google Talk to call or send instant messages around the world for free. Meanwhile, the Google Docs module allows real-time collaboration with any number of users. And Google Video for Education offers more opportunities for communication and collaboration.

Educators looking for a more robust application are turning to solutions such as LMS—Microsoft’s Learning Management System (www.sharepointlms.com/), which fosters an interactive, online community for everyone involved in the educational process.

With LMS, colleges and universities can establish official communications channels among educators, students, and others; enable professors to post videos of their lectures; and create a central location for professors to distribute and collect assignments, give quizzes or tests, post classroom schedules, and manage online discussions and conversation threads.

Online educational community creator Blackboard (www.blackboard.com) offers a similar system, Blackboard Learn 9.1, which integrates collaborative tools like wikis, as well as multimedia content from YouTube, Flickr, and SlideShare, to help educators create a more engaging course experience with enhanced visual impact.

"The possibilities to easily integrate video, audio, and pictures will make courses much more interactive and dynamic," says Filip Seuntjens, a project manager at the University of Antwerp in Belgium.

Joel T. Johnson, an instructional designer at the College of St. Scholastica (www.css.edu/) who participated in the Learn 9.1 beta program, agrees: "Coming from a WebCT environment, we found that Release 9.1 not only has the tools and features we need to migrate our courses, but it also allows us to improve our teaching and learning at the same time."

Meanwhile, Hargadon has his own social network—Classroom 2.0—which features thousands of educators and other members who have signed up to help track and shape the future of Web 2.0 technology in education.

Currently, the network offers more than 500 discussion forums, including special interest groups on Google Apps for Education, distance learning, technology integration, community building, educators using Facebook, cell phones in education, moving to the cloud, instructional technologists, and vocational e-mentoring.

Open Systems

Movements such as Linux, an operating system that is essentially owned by everyone, and advances in sophistication via the nonproprietary efforts of programmers the world over are destined to make further inroads into the culture at large, as well as higher education in particular, Hargadon says.

Forward-thinking technology providers such as Blackboard are already on the bandwagon, releasing products that run on open-system programs and furthering the view that computing freed from the shackles of proprietary barriers to innovation is computing that can evolve at a much more efficient and rapid pace.

For example, Blackboard’s Mobile Learn App solution, released this past June, was made available for Android, a mobile device and mobile phone operating system forged by Google, and is completely open system software.

Using Blackboard Mobile, students can use their mobile phones and devices to check grades and assignments, add posts to discussion boards and blogs, exchange e-mail, and engage in similar social networking functions. Most important, they don’t need to buy a phone from a single manufacturer to do it. Essentially, any phone using the Android operating system will work with Blackboard Mobile.

"These apps make learning a central part of the mobile experience that is quickly becoming a way of life for so many students and learners," says Michael L. Chasen, Blackboard’s CEO.

Concludes Hargadon: "Learning is changing. My use of Web 2.0 is changing how I learn. And education is going to have to change, too. Students have to be able to learn the tools of this new knowledge society, and they have to be taught to use them well. Students need you more than ever."

Joe Dysart is an Internet speaker and business consultant based in Manhattan. Reach Joe at joe@joedysart.com.
Mark A. Heckler began service as the 18th president in the 150-year history of Valparaiso University in July 2008. During his first year as president, he launched the most comprehensive visioning process in the university's history, a process involving alumni, students, faculty, staff, and community leaders that will chart the course for Valpo to achieve new levels of excellence over the next two decades.

**About Valparaiso University:** Valparaiso University is a coed, four-year, private institution founded in 1859. Currently, more than 4,400 students from most states and more than 50 other countries make up the student body. Fully accredited, Valpo has maintained a placement rate greater than 90 percent for 17 consecutive years. It offers more than 70 academic programs in five colleges: Arts and Sciences, Business Administration, Engineering, Nursing, and Christ College (the honors college). Located in Valparaiso, Indiana, the 320-acre campus includes 60 academic and residential buildings. Graduate Programs include more than 40 master’s degree programs and a School of Law.

**Mission Statement:** Valparaiso University, a community of learning dedicated to excellence and grounded in the Lutheran tradition of scholarship, freedom, and faith, prepares students to lead and serve in both church and society.

Mark A. Heckler
President, Valparaiso University

ACUTA: Increasingly, information communications technology (ICT) is playing a significant role in the university experience for students, including both campus life and academic success. How do you suggest campuses can best create synergies between ICT and other departments?

**Heckler:** First, I believe it is important for the president or chancellor to set the expectations for collaboration between ICT and other units on campus. This message can be reinforced among faculty by the chief academic officer and/or the academic deans. Second, ICT leadership must set the tone for inter-departmental relations, so that a strong customer-service orientation drives both the speed and quality of service provided to campus units. This, in turn, brings greater confidence in and respect for the ICT employees on campus. With trust and mutual respect operating at high levels, opportunities for collaboration multiply and those collaborations have a better chance for success and long-term sustainability.

ACUTA: In the classroom, the transition away from the “sage on the stage” concept to the “guide at your side” seems to be moving exponentially faster every semester. And now, the guide is likely to be not at the side of the students but available online just about any time. In your experience, what is the best way to make the transition to the digital age more comfortable for the generation that chose teaching as a career expecting to stand in a lecture hall to educate students? Is innovation being embraced and integrated into the classroom quickly enough?

**Heckler:** In many institutions, faculty are naturally skeptical about the pedagogical efficacy of technology. Given shortened student attention spans, declining interpersonal communication skills, information literacy limitations, and declining ability of students to engage in critical and self-reflective thought, some faculty quite rightly question the wisdom of moving so quickly and fully into a technology-based learning environment. These faculty members may be quite comfortable with their roles as “guides on the side,” but are reluctant to relegate the role of the faculty member to operating like a GPS device rather than substantially shaping the learning experience in situ.

ACUTA: What is the place of collaborative learning in the future of higher education? How can technology facilitate the increasingly collaborative learning style of today’s students?

**Heckler:** I believe that collaborative and experiential learning represent two key components of the emerging learning paradigm. The professor's role will evolve substantially over time, becoming that guide and mentor who will construct active, collaborative, and participatory learning experiences. Professors will also help students learn how to gather and authenticate content to support their active learning projects.
In addition to providing easy access to vast repositories of digital content, technology can offer simulated learning environments for hands on learning, critical problem solving, synthesizing and applying theoretical knowledge, and risk-free hypothesis testing. Technology will play an increasingly important role in educating tomorrow’s student and the role of the professor will become even more essential to effective student learning.

ACUTA: How does technology support effective governance at Valparaiso? What technology applications do you find most useful in carrying out your leadership and governance responsibilities?

Heckler: We deploy a variety of technology solutions to help streamline governance operations and communications. A password protected Blackboard site offers Board members a one-stop location for all Board meeting materials as well as background reading and archival material to support the efforts of Valpo’s ten Board committees. I regularly communicate electronically with Board members, offering periodic campus updates. Sometimes, I will use micro-sites and web surveys in order to engage Board members with particular projects or to solicit their input on a particular question or problem.

Valpo has spent two years in visioning and planning for its long-term success. The process relied on a combination of live and on-line interactive experiences, allowing faculty, staff, students, and volunteer leaders to review drafts of visioning and planning documents and offer their comments through surveys and blogs. As a result, there was a high degree of buy-in for Valparaiso University’s future direction.

Our faculty and staff governance bodies also rely heavily upon technology to facilitate meeting communications and archive records.

Personally, I believe the greatest contributions provided by ICT include improved communication, organization, planning, record-keeping, and feedback loops.

ACUTA: Valparaiso University has received considerable recognition for the unique design of its technology-rich library facility. What do you see as successes in your library design and what shortcomings have had to be addressed over the years (i.e. adjustments in staffing, building design, budgets, and so on).

Heckler: The Christopher Center for Library and Information Resources was designed with the understanding that we can’t know exactly what the technology needs and opportunities would be in the coming couple of decades. Consequently, the mindset in making decisions was to build in as much flexibility as possible. Areas of the facility with a high concentration of technology were built with raised floors so that power and data infrastructure could be refreshed without renovation. Pathways for wiring throughout the building were made robust even in areas where extensive wiring was not anticipated. In retrospect, we could have relied more on

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wireless technology in some areas, but at the time of design, wireless security was less advanced than it is today.

ACUTA: What are the next steps at Valpo? What exciting technological innovations are on the horizon? By what process do you set priorities and identify critical needs?

Heckler: Over the last two years, Valparaiso University has invested much time and energy in a focused strategic planning process. The priorities identified through this process will drive our technological priorities. The development of advanced functionality in cloud computing will offer excellent opportunities to lower costs and provide more seamless global connectivity for our principal clientele, the students. Other key areas of interest will include our ability to move to complete electronic document imaging and developing the capabilities of all of our principal functions in the mobile environment.

ACUTA: It is apparent from the impressive Vision and Mission Statements for Valparaiso's Office of Information Technology that you have attained goals that many other schools are still struggling to reach. IT obviously is supporting Valparaiso with leadership, resources and service, and it appears that all segments of your campus community are empowered by technology. How did you make this happen and how long has it taken? What has been your greatest challenge? What could possibly be left to improve?

Heckler: Even in areas where we have made progress, we continue to struggle to make the best possible use of technology to advance the mission of the University. Making this happen is an ongoing responsibility that involves constantly increasing levels of expectation and taking advantage of opportunities that are often unforeseeable. Through proactive communication with units across campus regarding their functional needs, IT will strive to discover or develop technology solutions to meet them. The greatest challenge is in predicting the future, and improvement must be continuous if IT is to remain a relevant part of the progress of the institution.

ACUTA thanks President Heckler for taking time from his very busy schedule to respond to our questions. Read more about Valparaiso University at www.valpo.edu.  

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Security Is High Priority at Ohio State

While high-speed backbones and broadband cellular get all the talk at college technology conferences, when the administrators face parents and potential new students, the overriding concern is for campus safety. In light of many recent incidents on American college campuses, it is not surprising that parents, students, and faculty want to be assured that their campus is safe.

Typical questions that parents may ask administrators on campus today are, What do you do to assure my daughter does not get attacked between classes? Or, What kind of high-tech response do you have for health emergencies?

Broadband is nice, but it is doubtful that any user will notice a couple of nanoseconds’ delay in downloading a homework assignment. However, if there is a health or safety emergency on campus, it will go viral in nanoseconds—guaranteed.

Researchers at The Ohio State University, Columbus, have come up with a campus security system that actually views and analyzes the way people move around campus. It “remembers” typical traffic patterns in certain areas of campus, and it spots anomalies. It will flash on a person weaving erratically: Is that person having a stroke, drunk, or lost? Why did another person stop and stand behind a tree that most walkers move quickly past?

Although the system is deployed today—and has been since fall 2009—when it is fully functional, the Ohio State application promises to give campus security the control and campus view that most central security stations only dream about.

The typical security chiefs will tell their IT people that they want a high-resolution security camera that works quickly and accurately. Then they’ll add on the niceties, such as a system with a big, wide view that makes it easy for security to know where they are on the screen and helps them identify problems before they become crises. Icing on the cake would be cameras that are faster and accurate for panning to a particular trouble spot.

Ohio State’s smart system does all of that and more. Their system scans views of thousands of people and identifies potential problems—people who may be intruders or intoxicated or just lost. Since most people are doing the same thing at the same time—say entering a building at 8 a.m. or moving purposefully toward a parking deck at 5 p.m.—the computer looks for unusual behavior.

These data are collected through standard security cameras, and each camera has an established field of view. “The system uses activity analysis and behavior analysis,” says James W. Davis, Ohio State professor of computer science and engineering. He developed the system and is expanding its capabilities.
"If I am interested in a particular individual or aggregation, I can push that individual into the program and get a value of how typical his or her activity pattern is," Davis explains. The longer the system runs, the more astute it becomes. The system does not know what problem the person presents—only that he or she is acting abnormally. "We care what you do, not who you are," Davis says.

"We are not trying to replace the human at the desk. But for a security guard trying to follow 100 cameras, this detects the onset of abnormal behavior and allows security to intervene," Davis says.

Getting the Big Picture

Typical security cameras pan, tilt, and zoom (PTZ) and rotate 90 degrees up and down. But when security staff looks through these cameras, they get only a tiny "soda straw" view of the world. As they move the camera around, they can easily lose a sense of where they are within a larger context. In OSU’s system, cameras take snapshots from every direction. The result is a seamless panorama, used to create a 360-degree, high-resolution view. (See Figure 1 on page 22.)

Davis notes that the cameras will choose the closest view to the incident. "For this we have to know the height of the building (to the camera mounting station), as well as the latitude and longitude," he says. They build a 3-D line from the camera to the spot of the incident.

"Originally, we used an X-Y grid on the ground. But we found that often more than one camera can view a location, and there is a difference between a camera on an eight-story building versus one on a three-story building," Davis explains. "On the ground, there is nothing to tell you the zoom level needed." That pushed them to develop the 3-D view analysis.

There are many situations—such as a mall or a plaza—where multiple cameras may offer coverage of the same area. Security simply has to click on the ground near a door or building, and the system will find the nearest camera. All it takes is one mouse click and the system does the rest," Davis says. Where multiple cameras have views of an area, it will offer views from all. Imagine one camera is aimed at a suspect running away; a second camera on the opposite side of the quad is likely to get a full-frontal view of the suspect and maybe a face shot.

Once a particular view is displayed on a computer screen (see Figure 2), operators can click a mouse anywhere within it, and the camera will PTZ to that location for a live shot. Or, security could draw a line on the screen to track a particular route—a certain street, for instance.

Davis compares it to Google Earth. The operator uses the standard joystick to point and zoom in on an image. Using orthophotographs, the operator can get close to the action. In many cases, the operator might not know where the image is—or might want to access a camera that gives a particular view. With the OSU system, there is no delay. Software drives the camera over the entire image, stitching together a series of images in a seamless panorama. The view is not the typical rectangular image but a fish-eye view.

Figure 2. Ohio State security can click anywhere on this campus image—in Google Earth fashion—and immediately the closest camera to that spot will produce an on-screen image.

Figure 3. Core cameras in the system cover zones around the Dreese Labs engineering center at Ohio State's main campus. The network currently is expanding, and eventually there will be hundreds of cameras across the OSU campus.

Figure 4. Davis can push a particular individual into the program and get a value of how typical his or her activity pattern is.
“Usually, a new security operator has to figure out the scene and stitch it together in his head,” Davis notes. “This gives one, single image.”

Conversely, the operator might know which building has a problem but not recall which of the dozens of cameras in the array will give the best view. A simple click on the map’s panoramic image—say on a doorway—will drive the program to the camera that covers exactly that spot. (See Figure 3.) These are not fuzzy images; the computer provides 1000x1000-pixel, high-resolution output.

“Security operators really like that feature. They don’t have to find the best camera and then hunt up the area. The program pinpoints it for them.”

Expanding the View

Currently, there are seven of these specialized cameras on OSU’s Columbus campus. They are standard Pelco Spectra III Series Domes and Spectra IV PTZ units. The IV requires only 5.25 inches space above ceiling and 3.25 inches below.

Including these seven, there are more than 500 cameras currently serving Ohio State’s Columbus campus. This year Davis hopes to continue to incorporate all of his research cameras into the larger main security network. Those stations are served by a mix of Pelco and Bosch cameras. Davis’s system will work with Pelco and Bosch cameras as well as with Sony products.

“When we developed this for the electrical contractor, we wanted something that was not tied to a single, expensive camera but that would work with any standard, commercial camera,” Davis says.

The software is Windows XP-based and runs on Dell computers. Davis chose to go with a wired, rather than a wireless, interface for two reasons. First, on the busy campus, interference could be an issue. Second, all the cameras in the buildings are already networked.

Cameras grab all video, convert it to a USB video connection, and process it through the computer for analysis. While most new systems today are IP-based, OSU uses analog.

Davis digitizes all of the analog video and puts it on the IP server. Since they are not yet integrated into the main Ohio State University security system, they purchased a DVR that records images from all of their cameras. “We can pull the DVR shot for security to review,” Davis.

Grad students Matt Nedrich and Kevin Streib, as well as doctoral student Karthik Sankaranarayanan, who is funded by the National Science Foundation, work with Davis in the lab.

Davis says they have fairly good algorithms for normal behavior in a specific area. They are still working on the algorithms for abnormal behavior.

“We have models of common pathways,” he says. Once they have worked out the abnormal behavior patterns, they will move to the next level, group behavior.

Moving Ahead

Analysis of group behavior—the interaction of individuals or groups of people—will be the next big challenge. “We are trying to fit groups versus nongroups into the algorithm,” Davis says.

If the system detects a single individual walking alone at night, it should flag it as a problem. Most people walk in groups of threes or fours at night, given the option. A single person could be headed for trouble. Or that single person could pose a threat to others. The system can spot that situation and follow it to resolution.

While the system does not “know” what the situation might be, it does know that there is something that merits watching.

“If the system sees a group of three people and an individual moving in the same area, the system should set an alert. If they come together, it will automatically track the scene,” Davis says.

The next challenge Davis sees is tracking in a dense crowd. “That’s not yet ready for prime time,” he says, noting the difficulty of tracking a person who goes behind a truck to reappear elsewhere in the scene; or, the problem the program has when the camera sees a person from the front at one moment and from behind—where the view is quite different—the next. (See Figure 4.)

Still, the Ohio State system has solved a number of the basic problems to answer the growing concerns many parents and students have for campus safety. The system gives law enforcement a chance not only to corral the bad guys but also to help good people who are having medical emergencies or appear lost on campus.

While there still is a way to go, the system is up and working in sections of the Ohio State campus. "The state of Ohio is encouraging the development of the system," Davis says. A grant from the state has allowed them to do further work. In addition, the Air Force Research Lab also supports Davis’s work.

“We have a number of security professionals who are quite excited about the system,” Davis says.

University or college security and telecommunications offices that would like to purchase the software should contact Ohio State. All the intellectual property is owned by the university, but Davis indicates it may become available to the public or to other schools who want to use a similar system.

Curt Harler is a freelance writer and contributing editor to the ACUTA Journal. Reach him at curt@curtharler.com.

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Making the Most of Mobile Communications

Paul Korzeniowski

What’s as commonplace on campus as jeans and T-shirts? What else but the cell phone. On virtually all campuses, hundreds, thousands, and even tens of thousands of individuals carry cell phones in their purses, backpacks, and pockets. In fact, a spring 2009 survey of 300 Ball State University students found that 99.7 percent used a handheld device to send text messages, e-mail, photos, and videos. Sometimes, they just want to say “Hi” to friends. In other cases, they rely on the phone to complete their homework. Increasingly, colleges are outfitting their employees with these compact systems, so they can complete their work more efficiently.

Recent changes are the result of advances with smartphones, which possess enough intelligence to allow a person to read e-mail, surf the Web, or watch a video. Not only have these products become more powerful, but they have also become easier to use. For instance, Apple has received a great deal of credit for delivering a smartphone that offers users an intuitive interface as well as a robust set of features. Consequently, the technology has already begun to change how classroom information is delivered and how academic institutions function. Moving forward, their impact is expected to grow as prices drop and capabilities rise.

While these devices hold tremendous promise, they also create some challenges for academic communications staffs. Cell phones introduce new support requirements, as staff and faculty need to be trained in how to use the products, and network administrators may have to re-architect their networks to minimize the impact on network performance.

Mobile Application Development Tools Improve

Increasingly, cell phones are becoming the primary way that individuals access information via the Internet. “The development tools available with mobile devices are quite good, so it does not take a lot of time to add a mobile interface to existing applications,” explained David Morton, director of mobile communication strategies at the University of Washington. On many campuses, students log onto the campus homepage to find out about what is happening on campus—how the local sports team fared, what new discoveries researchers have uncovered, and what entertainment will soon be on campus.

These systems can also be used to deliver time-sensitive information. On a sprawling campus, mobile communications devices offer a way to communicate instantly with faculty, staff, and students. For instance, an e-mail could notify students that a class has been canceled or inform faculty of a change in a meeting location. The University of Washington, which has been working on mobile application development for three years, has deployed an application that uses GPS and cell phone features to inform students about the progress of school buses. “Students can decide if they want to wait for the bus or run to their class,” noted Morton at the University of Washington, which has 65,000 students, faculty members, and administrative staff spread out over three campuses.

In more serious situations, the phones can be used to notify individuals of an emergency on campus. In such cases, sounding a loud siren may not be sufficient.
Colleges are expected to take advantage of recent technical advances whenever they need to get information out quickly. Several tragic events in recent years have served as wake-up calls to many institutions with outdated notification systems. They need better ways to push information to students and staff should similar emergencies arise. Several companies have developed applications that send out text or voice messages to students, faculty, and staff during an emergency.

Leave the Laptop at Home

Cell phones can also provide access to academic data more conveniently than laptops. Students can easily carry a phone in their pocket and just push a few buttons to check their grades, examine their class schedules, or download course materials. Faculty are getting comfortable with using cell phones to view their class lists, post assignments, or e-mail students.

In response to the widespread acceptance of the cell phone as a do-everything tool, higher-education software suppliers have recently added mobile device support to their product lines. San Francisco–based Terriblyclever Design was started by a group of students who worked with Stanford University to build iStanford, a set of applications that delivered campus information to Apple iPhones and iPod touch systems. After that project was completed, the company constructed similar applications for Duke University, the Medical College of Georgia, and Texas A&M University. The University of San Diego, which has 7,800 students, was among the first 10 institutions to deploy the product and has made 10 applications available to students and staff members. “Students really like the directory system, which enables them to e-mail or call their professors,” noted Chris Wessells, chief technology officer at the University of San Diego.

The start-up was so successful that Blackboard purchased it in July 2009. With its Mobile Central application, users can search course catalogs, view campus maps, e-mail professors and class mates, and receive real-time updates on course schedules, campus events, news, and sports. In addition, institutions can use Blackboard application programming interfaces to customize and personalize the program’s user interface. Since the Blackboard purchase, the system has been expanded, so it also supports Research in Motion’s BlackBerry devices.

Tying into Social Networks

Datatel, another higher-education software supplier, delivered Datatel Mobile in spring 2010. This software was built in conjunction with DubMeNow, a three-year-old company focused on developing mobile software. The Datatel system provides users with smart device access to personal class schedules, class assignments, class rosters, events, announcements, and documents. The software supports social networking platforms. Users can exchange e-mail, phone, address, Facebook and LinkedIn profiles, and instant message information. Datatel Mobile is available on Apple’s iPhone and iPod touch, RIM’s BlackBerry, and Google’s Android devices. Support for Microsoft’s Windows Mobile, Nokia’s Symbian, and Palm’s Pre is slated to arrive by the end of 2010.
AT&T offers UpperClass, a mobile system that delivers campus-related information to students, administrators, faculty, parents, and alumni. Students can use their mobile devices to track their GPAs, get maps to building locations, monitor balances, add money to campus spending cards, view dining hall menus, or request an escort from campus security. Parents can use the service to monitor students’ schedules, grades, and spending. Faculty can see reports on their students’ progress. Alumni can check team scores or buy tickets to events.

In addition to off-the-shelf applications, academic institutions are building their own mobile applications. A number of initiatives are underway at Ball State University. The university’s School of Nursing admits about 130 nursing students each semester and has approximately 45 faculty members. Clinical students purchase HP iPAQ smartphones along with secure digital cards that are preloaded with medical information traditionally found in reference materials, such as drug guides, laboratory and diagnostic manuals, and nursing procedure manuals. At patients’ bedside, students can enter questions and receive answers about items, such as a lab value. Previously, they had to refer to a textbook or enter information on a healthcare system terminal, which usually required leaving the patient’s room.

Focus on Apple’s iPhone

Ball State University’s Michael Hanley, a professor of journalism, has helped spur mobile application development. One area of focus has been Apple’s iPhone. For the past three years, Ball State has offered a course on iPhone application development. “Our biggest challenge is providing students with enough time, so they can finish all of their applications by the end of the semester,” said Hanley.

In fact, the variety of possible mobile applications is left only to students’ and faculty members’ imaginations. Faculty members use them as enhancements to their classroom presentations. The University of Richmond, with about 4,200 students, has been working with Apple’s iPods, iPhones, and iPads, since 2005, according to Fredrick Hagemeister, coordinator for academic technology information services at the university. In some cases, faculty members produce supplemental materials that students download. Rather than five-page papers, students create podcasts, incorporating audio tracks, images, and hyperlinks.

In addition, professors can develop other classroom aids, such as real-time polling during a presentation. This interactivity can increase student participation. Typically, if instructors ask a question in class, they might get 20 percent participation in the form of hands raised. With polling questions, student participation can reach 100 percent. Another plus is that instructors can track answers back to individual students and offer assistance, if necessary.

Other novel uses are emerging, with the next big wave expected to be tying mobile communications to electronic commerce. For instance, students could use their phones to purchase their lunch, or fans at a basketball game can buy hotdogs and have them delivered to their seats. “Eventually, our students will be able to pay their tuition via their phones,” stated University of San Diego’s Wesells.

What Are the Downsides?

While mobile devices offer academic institutions a number of potential benefits, these systems also create new challenges. “There is no consistency in the design of smartphones,” noted University of Washington’s Morton. Consequently, application development and troubleshooting problems become more complex. The IT staff will need to develop expertise in a wide range of devices. In addition, the applications are new, so how well they will migrate from version 1.0 to version 5.0 releases is open to question. Because these products are not as mature as PCs or laptops, there may be an increase in technical support requests. How these requests are handled may also change. Since these devices are portable, students may walk up to the help desk rather than phone their problems in.

The list of individuals who may require help will expand. It may fall to the communications department to provide ongoing formal training sessions to teach instructors how to make use of the devices. For instance, the University of Richmond holds special training classes to demonstrate to the faculty how to incorporate the devices into their classes.

In addition, the mobile devices use network resources in novel ways. Communications departments may be surprised by the amount of logging on and off that even a single iPhone connection demands. When the device goes to sleep, which it typically does after two minutes of nonuse, it temporarily disengages from the network. Academic institutions do not see the same behavior with laptops because they do not go into sleep mode after two minutes. Also, even if they do go to sleep after 10 minutes of inactivity, laptops do not disassociate themselves from the network. Consequently, communications departments may need to spend time developing new metrics so their networks deliver adequate response time to users.

Coverage Issues Emerge

Schools have to think about capacity as well as coverage. If faculty members use mobile devices in class, the network has to be able to handle the requests. In some instances,
more bandwidth will be needed. However, deploying wireless connections can be challenging. Items such as the students, desks, and classroom materials can cause interference. Consequently, technicians may have to place access points along the walls or even in ceilings. Figuring out where to place these devices can be tedious and time-consuming work. The result is that more cell phone use often leads to wireless network expansion—in some cases, doubling, tripling, or even quadrupling the available access points. Network administrators need to build such items into their budgets.

As more faculty and staff rely on their phones to generate and consume information, colleges and universities are looking for creative solutions to control cellular network service charges. One way is to install a campuswide mobile network that allows dual-mode phones to switch seamlessly between cellular signals and campus WiFi networks. Here, fixed mobile convergence devices monitor the location of an active cellular device and adjust their signals as users move from one network to the next. This approach does require special routers. Vendors, such as Agito, Cisco, and HP, have delivered devices that enable individuals to go from one environment to the next.

There is no doubt that use of mobile communications has been expanding on campus. This technology offers academic institutions plenty of opportunities to enhance communication with students and alumni, improve classroom presentations, and streamline business processes. However, these institutions will need to make a number of internal adjustments to take advantage of the technology. Once those steps are taken, mobile usage is expected to emerge as a cornerstone in academic computing in the future.

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What Do Students Want?

It is a question that every college and university IT professional, and most every faculty member, must have asked in the wee hours of the morning: Just what do students want? Two survey reports released in July 2010 by CDW-G, or CDW Government, the public-sector division of the giant technology provider, focused on the unique needs of government and education and addressed this difficult and amorphous question. The CDW reports—the 21st Century Campus Report (college and university) and the 21st Century Classroom Report (high schools)—asked specifically: What do students want?

Three points seem especially relevant:

- 63 percent of current college students say technology on campus was important in their college selection criteria.
- 93 percent of today's high school students say campus technology is important in their college selection criteria.
- 95 percent of today's high school students expect to use technology in college during all or some classes.

The Campus Report rated the top five technologies considered extremely important by today's college students (see Figure 1). The wireless network topped the list at 77 percent. Access to the campus network from an off-campus location was next, at 57 percent. The final three (in order) were course management system, digital content, and multimedia content streaming.

The Classroom Report listed what technologies high school students want to use in college (see Figure 2). Once again, the wireless network was clearly top of the list, at 81 percent. Among high school respondents, 69 percent thought the campus computer lab would be important. More than half thought digital content, off-campus network access, and interactive whiteboards would be useful, and some expect to have access to recorded class lectures and e-readers.

Do ACUTA Members Have the Same Take on Student Needs and Desires?

To learn how these statistics compare to what ACUTA members have seen, we asked four questions of three individuals: Anthony Mordosky, associate provost, Information Resources/CIO at Rowan University; Adrienne Geralds, associate director, Information Technology, Rutgers University; and Ron Kovic, professor, director/CICS Program, Ball State University. What follows are their responses.

* Note: People who take online surveys are presumably more technology oriented than those who don't work online, so the results of such a survey may not reflect the population in general or, perhaps (but less likely), the student population; but even given that possible skew, these results are still informative and useful.
What technologies, services, and access are students already requesting or demanding?

Mordosky: The primary driver for technology requests from students continues to be access and bandwidth. This is a group that expects, and indeed demands, continuous access in a true “any time” and “any place” environment. Rowan University completed a campuswide wireless deployment last fall that includes the interior of all buildings as well as all outdoor space on our 200-acre campus. This was done to try to meet the student expectation of anytime, anywhere access.

This requirement/student expectation yields frustration for not just students but faculty and staff as well.

A student will send an e-mail at 1:30 in the morning and complain that no one responded till 8:00 a.m. It could have been that the student sent the e-mail to a faculty member or my help desk, but their expectation is the same: Someone will answer within minutes. This is a situation that, with limited budgets, is unlikely to change—at least from a help desk perspective.

The other great expectation is unlimited bandwidth. Internet connectivity is a significant issue for my campus, and I would speculate it is the same for most campuses. The students expect to be able to play interactive games with others—anywhere in the world. They come from homes that typically have broadband access of some substantial capacity, often 1.5 to 6 megabits. If I had to supply even 1.5 megabits, just for our resident students, I would need to purchase in excess of 5 gigabits of Internet connectivity. That is about 20 times what the campus can afford. This, I suspect, will continue to be one of the main challenges campuses will face in the foreseeable future. Even as Internet connectivity becomes cheaper, the demand continues to outstrip our financial ability to meet student demand.

Geralds: Students are simply demanding unlimited, unfettered access to any and all services.

Kovac: Certainly the cry for access anywhere, anytime, and anyhow is continuing, but this time with a minor change—speed and flair. They want the answers and their interface to have a flavor to it that is appropriate to their level. Students want color graphics, sound, and music. It’s not just the information, but also the wrap-around shell, that makes it for them.

Of course, the iPad is the hot interface device now, and they expect everything to be in the cloud. I have seen many students use tools such as remote access to use their home PC or even a laptop as a cloud. Google docs is the tool to use for sharing between them. Social media is not talked about, but it is an integral part of their lives that they cannot imagine people not using. There is also a beginning level of fear that the cloud may not forget anything they say. The smarter ones are considering this and weighing the thought against instant gratification.

What technologies, services, and access do you see them requesting two years from now?

Mordosky: In many ways, I expect the demand to be for support of whatever is the current mobile gadget—not really any different from what it is today. Currently, students not only want to register (all devices must be registered to gain access to our campus network) their computer(s), but also their smartphone and game console(s). I expect this will continue, and the number of devices they want to use on the campus network will continue to increase.

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As an example, we are seeing an influx of iPads being registered. They are the most current new gadget.

What we hear from students, and I expect will continue to hear for the next few years, is that they want to access all university services online—not just from a laptop or desktop computer, but from their smartphones. This is fast becoming an expectation, and when some service does not appear usable via their smartphones, it results in student complaints. The expectation of access to anything from anything is becoming a huge challenge, especially for the campus ERP and LMS systems.

Geralds: More of the same. The devices may change from desktops to laptops, or from the iTouch to iPhone or iPad, but in the end, it’s all about “The Network.” Students want ease of connectivity and lots of bandwidth. Wireless is no longer an expectation but a known assumption. As technology leaders, it’s our responsibility to stay ahead of the curve and to anticipate the needs before the demand.

Kovac: Certainly, they want more video in everything. When they make a call, they want to see and hear the person. Of course, that communication needs a texting feature on the side for “sidebars.”

Although “smaller and lighter” is always the key, interestingly I have not heard many complaints about the battery life of devices. They seem to accept it.

Certainly, a movement away from hardware and into the cloud is happening. Users know they need an access device, but a big bulky PC is just too much. Everything is up in the cloud.

What are today’s realities regarding current demands for technologies, services, and access?

Mordosky: The reality regarding current demands is that we are limited by budgets that, in many cases, preclude adding new technologies, services, or increased access. Our challenge is to provide those technologies, services, and access that enhance the campus learning environment. Yet, these are often not what students would consider a priority.

Geralds: The demand for Internet access continues to grow as an expense for the university. However, we recently completed a network project that positioned us to obtain near-wholesale pricing for commodity Internet service. This allowed us to greatly increase our commodity Internet service at a greatly reduced monthly cost. We nearly tripled our Internet access for half the current cost.

Kovac: Because students are coming to campus with their own access devices, the university has to provide the cloud services, access bandwidth, and application services they need. It will be a challenge for universities to provide the latter in an integrated fashion, while also balancing security.

What can colleges and universities do to manage (if not satisfy) the demands of the future (as little as two years from now)?

Mordosky: Trying to limit expectations of what is doable in information technology has, at least for us, proven very challenging. Students, and I dare say many faculty, have no concept of what it takes to support the campus infrastructure that enables the use of all their gadgets. They just expect them to work. That said, I do think we need to continue to try to set reasonable expectations for technologies and technology services—within the limits of available resources.

Geralds: Universities can better position themselves by making intelligent business decisions with regard to their connectivity, identifying strategic areas for centralization, and preparing strong ROI plans for services.

Kovac: The best answer I have for this is watch, listen, and learn. Students are bringing a new culture to the universities. Concern over whether we like it or not is for naught—it is coming. A balance between our sanity and their sanity must be maintained; and slowly, even the students are beginning to realize this (i.e., the security and elasticity of social media, and benefits of face-to-face instruction, talking, etc.). Some things take generations to change fully, and the move to a virtual social and educational medium is one of those.

Other observations: E-mail and even texting are considered so old fashioned. Cell phones are antiques. They don’t look at you when they walk by—maybe it’s the earbuds on.

A cautionary note revolves around education and critical thinking. Snippets and soundbites do not allow for critical thought, which is the item we need from the educational system. I am afraid the average attention span is declining and that we are raising a generation with little ability to focus for more than one hour.

What Does It All Mean?

It seems apparent that students demand a broad spectrum of services and desire to use the most recent technologies to access college and university services. They want to collaborate and communicate online, using a vast array of mobile technologies to seamlessly and securely access instructional materials, stored data, and entertainment services. It is also apparent that users have little knowledge of the overall cost of providing such access in a secure and reliable environment.

We can also conclude that today’s IT professionals have the responsibility to provide what is possible, and must do it within budget and staffing constraints. Convincingly communicating the reasons and rationale for policies and limitations will be a challenge in a time of rapid technological advance and cultural change. In some cases, just getting our users’ attention may be a daunting task.

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2009-10 Institutional Excellence Award
University of Pennsylvania

Our PennNet Phone (VoIP) project is a multi-year, university-wide undertaking that will greatly assist with Penn's intensive cost-reduction efforts by saving over $1M annually at project completion. Monies recouped by this administrative effort are being directed to the schools to support new academic programs such as Penn's efforts in Global Health, a new Nanotechnology Building, increasing financial aid to students, and many other critical research and academic initiatives.

The project originated in the information systems and computing, networking and telecommunications (N&T) department with the goals of replacing the existing Verizon Centrex service which supports more than 20,000 administrative lines and the analog voicemail service (Octel) that supports 10,000+ customers with an open-source/open-standard, feature-rich, and cost-effective VoIP solution and Asterisk voicemail. Migration to this new service is well underway and will be completed over the course of several years.

As of the end of August 2010, we have about 6,000 PennNet Phone customers. We will rapidly deploy the service across campus over the next few years with complete migration from Centrex to PennNet Phone and Octel to Asterisk voicemail by June 2013. Upon completion the PennNet Phone project will provide a case study for others in the higher education community.

A Unique Project

In 2004, we began evaluating several VoIP solutions, most notably Cisco Call Manager, Broadsoft's Broadworks product, and Verizon's Hosted IP Centrex (HIPC). Because none fit well technically with our unified communications plans and all cost more than we had allotted, in 2008 N&T decided to build its own VoIP service.

The PennNet Phone project is unique for several reasons, including the use of open-source/open-standards solutions which enable true unified communications with Penn's e-mail, instant messaging, and voice mail. Integration with our campus e-mail service is complete, and customers have the choice to receive voice mail using e-mail, their phone, or both. PennNet Phone subscribers are automatically provided with an account on our secure instant-messaging service, and further integration of e-mail, IM, and VoIP is planned for the future.

Leveraging open-source solutions, we provide a feature-rich and highly available communications platform. Integration with other centrally provided IT services strengthens our product offering while new open-standard technologies like SIP trunking represent the potential for future cost savings. By aggressively developing new features and pursuing additional cost savings, PennNet Phone will continue to be the choice for telecommunications at Penn.

The success of the PennNet Phone project is due in part to our ability to form productive and unique partnerships with our university customers and our vendors. Penn utilizes a decentralized support model where local resources in each school provide initial support for IT services such as VoIP, as well as make ordering decisions for telephone services. Over time those roles have expanded and evolved. Traditionally, all IP-based services were supported by local IT professionals and all traditional voice services were supported by telephone support providers. After launching our VoIP project, we decided to use a hybrid model that best suited a particular unit. Local support for PennNet Phone is now done by both IT professionals and traditional telephone support providers. The project's continued progress is due to the flexibility and talent of these individuals as well as some unique programs developed by ISC staff.

To help ensure the success of the support model, N&T launched a PennNet Phone Special Interest Group where support providers, customers, and decision makers meet regularly to discuss the service and learn about best practices.
practices. This group is also a valuable input mechanism to the development team when it considers new feature enhancements. Additionally, we hold weekly “lunchtime learning” sessions where support providers and customers can receive targeted training about the service and any new features. Both of these initiatives have been very well received.

We have formed strategic partnerships with several vendors and service providers. Verizon has been involved and supported our transition efforts as well as partnered with us on providing PRI and SIP trunking connectivity to the PSTN. Penn has contributed to and benefited from the development efforts of the Asterisk open-source community. One local consulting agency, OneBIZTONE, has also played a role in the project management, feature development, and design of the PennNet phone service. Finally, we have utilized feature-rich VoIP sets from Polycom during the most recent phase of our project.

Staff has been very active in sharing the results of our project and has done many presentations and written articles that have been featured in various trade magazines.

Scope, Complexity, and the Planning Process

Since 1995 N&T has been articulating its technical vision in our PennNet 21: Technology Vision for a 21st Century PennNet technical white papers. Over the years, those documents have guided our approach on convergence, identity management, telephony, and a host of other important technical decisions and directions. We first establish our technical vision. Then strategic solutions are aligned with Penn’s broader mission. Finally, we develop our long-range goals which are fine-tuned on an annual basis. This approach has proven to be very effective organizationally for us.

N&T has always been a very entrepreneurial group. Many ideas start as grass-roots initiatives and are funded after a brief business case is completed. This process has helped us establish a very successful video productions group, operate an Internet2 GigaPop (MAGPI), start our VoIP project, and initiate many of the other 60+ services that we deliver to the Penn community.

We knew by 1996 that in order to meet the research, academic, and administrative needs of Penn in the 21st century, we needed to build a very robust IP infrastructure that both enhanced capacity and increased reliability of our data networks to support future IP-video and IP-telephony systems and services. We also wanted one converged IP network to eliminate our aging telephony and analog video infrastructures to reduce costs. Therefore, over the past 10 years, we have enhanced our data network by installing single-mode fiber to over 150 buildings. By leveraging this robust IP network, we are able to merge the PennNet Phone service onto our data network very cost effectively.

While we worked on this technical convergence, we also embarked in 1999 on our organizational convergence efforts and brought the telecommunications, network, and video groups together under a single leadership in 2000. This effort was not without its challenges as cultures clashed, roles changed, and a new breed of hybrid data/voice consultants and engineers was born. We cross-trained our staff on data and telephony knowledge and ultimately found new ways to deliver converged services to our customers.

The project had the full support of our VP and EVP from the beginning due to the rigorous financial justifications provided. The AVP took a very active role in the technical direction and business case of all the alternatives investigated. Given our proven track record of delivering cost-effective and highly reliable services, our VP and EVP gave the PennNet Phone team a lot of latitude when choosing a technical direction.

The initial resource commitment funded our engineering group’s research and development. Over time, as the project moved out of the lab and into production, significantly more resources were applied, including a full-time project manager and more than 12 FTE in all parts of the organization including support, operations, infrastructure, engineering, systems, services, and administration.

We encountered major obstacles in the early phases of the project that included: service stability, a limited phone feature set when compared with Centrex and Octel, and high costs—all of which contributed to low customer adoption rates. Upper management involvement was required for high-level resource reallocation. Project coordination became an intense focus as other high-priority engineering projects were competing for the same technical resources as PennNet Phone development efforts. Projects were reprioritized, resources reallocated, and different approaches explored to manage expenses. In these tight fiscal times when additional staff resources are limited, this is proving to be a continuous process for us.

We hardened the infrastructure, including the PSTN gateways and PRIs, to increase reliability; developed comparable or superior features; evaluated and installed lower-cost phones; and developed tight processes to increase customer satisfaction and increase migration productivity. We continue to operate our VoIP solution using carrier PRIs with the anticipation of switching to redundant SIP trunks this fall. PSTN connectivity remains our largest exposure to risk from a cost and reliability standpoint. We recently certified the Juniper Session Border Controller, passed all SIP compatibility tests with Verizon, and are working on getting the SIP trunks installed.

We prepared for an accelerated rollout of our PennNet Phone service by survey-
ing our ACUTA peers on the methods they used to support large-scale VoIP installations. We used this input and, in consultation with our project steering committee and our office of general counsel, changed our implementation strategy. Some key changes influenced by our ACUTA peers included: discontinuing the end user requirement to sign a "terms of service" agreement, leveraging our back-office data to assist us with planning the installations in terms of "easy" and "difficult" buildings, and establishing a training program for support providers and customers. By improving and streamlining the installations, support, and training services offered, we were able to expand our PennNet Phone program from small group conversions to large-scale, building-wide conversions.

Current State of the Information Communications Technology and Network Services

N&T technical staff members Deke Kassabian and Steve Blair, along with several others, discussed the broad concepts with the AVP as early as 1999. From 2000 until 2004 only basic protocol and server implementation research was done. By the end of 2004, a practical model for using existing open-source/open-standard solutions had been modeled and demonstrated.

PennNet Phone is broadly deployed across campus with hundreds of new sets added each month and is supported by existing technical staff in N&T. PennNet Phone uses the modern IP network already in all campus buildings. Through the use of open-standard technologies such as SIP and open-source software that is easily extended to make use of campus security and identity facilities, PennNet Phone has proven to be flexible and easily adapted to tightly integrated use at Penn. It is also very cost-effective in that there is no per-phone or per-user license fee and in that the development and deployment makes use of staff expertise already on hand for a variety of other network services.

PennNet Phone uses industry standard IP phones that plug directly into existing Ethernet switches that use the campus IP network to reach necessary standard model servers and gateways used by many other network services at Penn. The user interfaces that allow for service configuration (customer and administrator) use campus Web standards for a familiar look and feel. Those interfaces in turn make use of campus standard identity systems for directories and user authentication.

We did numerous presentations to campus organizations: IT executive staff, IT support staff, IT security staff, business administrators, auditors, facilities personnel, and executive leadership. We also engaged Penn's legal counsel on several points. As the service came to maturity, we created standard support channels, special interest groups, regular training sessions, and more to fully integrate the service into a standard and supportable service.

The project combines the migration from Centrex to VoIP service with new support, training, billing, and ordering services. Replacing a legacy phone system that has been in broad use for more than twenty years with something that is not "like for like" can face customer resistance. Combining the implementation with many benefits, such as improved mean time to repair, self-service ordering and support portals, and tools to audit and reduce the number of telephone lines in use, has our customers embracing PennNet Phone. Using this unique and strategic approach, we have seen rapid growth in the adoption of our service.

PennNet phone is well known within the IT and telephony community at Penn, and the effort is staffed throughout N&T. For example, network operations staff are responsible for general data network operation are also responsible for the networks supporting PennNet Phone. Programmers and systems administrators who manage other online services (Web, e-mail, and more) manage the software implementation of PennNet Phone. Our staff and service delivery is truly converged.

Most colleges and universities that have made the move to VoIP have done so with a vendor-supplied solution, such as those from Cisco or Avaya. Very few, perhaps five or so, have gone open source in full production and only one other large research university has done so in a way very similar to ours.

Quality, Performance, and Productivity Measurements

We established a PennNet Phone steering committee with representatives from all service areas in our department: development, operations, installations, training, and billing. The steering committee is responsible for quality control, high-level decisions, and defining the overall road map for the program. Each service area is responsible for tracking the quality and performance in its area of responsibility.

We measure the number of installations scheduled and completed each week and month, which assists us with workload and asset management and helps us measure the project installation pace against our monthly and annual goals. We also track and report on the number of trouble tickets opened each week. The number of days open is also monitored to ensure that the tickets are being processed within our SLA. Twelve-month trends are analyzed to identify any increase or decrease in the quality of service. We also look at trends to identify problem buildings and proactively address these concerns.

Trouble tickets in particular are used to focus both development and operational efforts to enhance the service. Examples
include: voice quality issues in particular buildings leading to wiring upgrades and requests for specific customizations to customer call handling done manually by server operators, which have led to enhancements of provisioning tools accessible by support providers and customers.

The installation reports collect data regarding the building, installation date, customer contact, number of telephone lines and sets being installed, and name of project manager for each project. By collecting this information, we consolidate our building visits, not only for our voice infrastructure but also for our data infrastructure as well. With more than 200 buildings, we need to be as efficient as possible with our converged service delivery.

Performance measurements, both current and historic, are available at all times at http://status.net.isc.upenn.edu/. They are reviewed by staff as part of project and operational work and by customers. Measurements are communicated to senior management as part of a quarterly reporting process. Twice-yearly summaries are presented in customer special interest group meetings.

When it is feasible to measure the components of the network services, we write tools or use existing open-source software to poll services for availability and responsiveness. IP services, including http (Web) and SIP (voice), are tested every three minutes at minimum for expected and timely responses (such as a Web page or a protocol banner). The operating systems of servers critical to the voice service are constantly polled via network management software (SNMP) for essential running processes. Counters for internal system data, including disk access time and CPU utilization, are automatically tracked and periodically reviewed for capacity planning purposes. Standard round-trip network tests are automated and run 24/7/365. Counters on network electronics are polled regularly to gauge use of bandwidth. Testing is performed from a non-server network to best approximate the end-user quality of experience. We leverage existing tools which are also used to measure and report on other network infrastructure and user services, including e-mail, Web, and DNS. Those methods and tools translate well to our IP-based voice services.

Cost, Benefit, and Risk Analysis

The most notable financial benefit of our PennNet Phone initiative is the reduction in operational costs to Penn. The project has already realized about $300k in annual savings to our customers and is projected to save over $1M annually at full implementation. In FY 2008 Penn’s total telephony costs were nearly $9M annually. At project completion, with a total conversion to PennNet Phone, these costs will be less than $8M. Additionally, we will benefit from eliminating the use of aging copper building-to-building infrastructure which has caused problems in the past in terms of long outages and very high replacement costs. Due to our extensive use of open-source/open-standard technologies, most project components are internally managed and developed and are interchangeable. Therefore, we can control future costs and feature development and integration without paying high ongoing license fees.

Customer satisfaction has increased as enhanced features have been deployed and more rapid repair and installations are supported. The Penn community also benefits from additional savings from a reduction in move, add, and change (MAC) costs. A central goal of the project has been to allow customers to move their own phones without the need for a technician to service the location. In the future, the community may see a further reduction in costs if a PennNet phone and a computer can use one network port.

The most significant costs related to this project include staff time and vendor costs associated with PSTN connectivity. Staff time associated with research and development, implementation, operation, and administration consume about 12 FTE annually. The project has been ongoing for nearly five years including early R&D efforts. We anticipate a similar level of effort until June 2013. Thereafter, most efforts will be operationally oriented.

Indirect costs included the reprioritization of several other initiatives and projects in order to free needed staff time to move PennNet Phone project to fruition. This switch in resources left some projects understaffed which resulted in the hiring of temporary staff to fill this resource gap.

Customer Satisfaction and Results to Date

From the early phases of the project we realized that customer involvement would be vital in order to succeed. We organized “townhall” meetings with our customer groups, creating a forum for them to provide us constructive criticism regarding the traditional and VoIP services offered. We received specific examples of how we could improve handset installations, trouble ticket services, provisioning services, and training while reducing telephony costs. We dedicated resources to follow up on all feedback received so as to maintain our customer’s confidence. As we provided consistent communications and timely resolutions to reported problems, customers quickly learned that we listen and we care, and they became actively engaged in our telephone service program.

We recently completed a 12-month program of upgrading the services we offer based on the recommendations received from the townhall meetings. These upgraded services include: Web-based trouble ticketing, improved provisioning services, Web-based order management, comprehensive telephone audits to assist with
reducing overall telephone inventory (lines, sets, voicemail, and circuits), and monthly telephone support provider and customer training. As a result, our customers have embraced the program and have started to sell the service on our behalf, a clear indication of customer satisfaction.

Other recommendations implemented include the hybrid support model and trouble reporting. Our customers requested that we update our installations and support services so that a technical background was no longer required to order or support PennNet Phone. This change opened the door for traditional telephone support providers to manage PennNet Phone. Initially, customers could only report problems by calling the support desk. Based on customer requests, we developed a Web service that leveraged our BMC Remedy service desk for both our traditional and PennNet Phone telephone tickets.

Weekly reports are provided to management measuring the mean time to repair for all reported tickets. Exception reports are also provided for those tickets that do not meet our SLA. We now provide both traditional and PennNet Phone customers a common Web service to report problems. Remedy trouble tickets are automatically dispatched to technicians working in the field, which reduces the time-to-resolution and improves customer satisfaction.

The newly developed Web-based order management system is used to automate the scheduling and dispatch of services for all PennNet Phone installation requests, streamlining the process for customers who now perceive it as being easy, on-time and non-disruptive. Daily and weekly reports are provided summarizing the orders scheduled for installation. These reports are used to manage inventory, schedule on-site customer surveys and automate the billing transactions. 100 percent of our installations are completed within our SLA.

A train-the-trainers model was initially deployed with PennNet Phone; however, customer feedback indicated that each school had a different need for training. Some departments were able to host training, while other departments requested training to be provided centrally by our organization. We therefore initiated the weekly lunch-time PennNet Phone training classes where customers can register for the courses conveniently via a Web service. PennNet Phone support provider and customer training are also offered.

Our customers' ownership of our new telephone service has led to an accelerated rollout of our PennNet Phone program. Last fall, Wharton School of Business sponsored a school-wide upgrade from traditional phone to PennNet Phone. They converted their administrative offices first to establish a clear example and then coordinated all customer communications and installation schedules on our behalf. As a result of this model, the Wharton School is on schedule to completely convert five buildings to PennNet Phone sometime this fall. Our School of Medicine is adopting the same model and has mandated the upgrade from traditional phone to PennNet Phone. Their project to convert 10 buildings to PennNet Phone started January 2010 and will continue throughout the entire calendar year.

In addition to informally gauging customer satisfaction by the adoption rates, we also have our project leaders visit the department within two hours of being upgraded to PennNet Phone. Our approach is intentionally designed to be a hands-on experience so that we may respond quickly to our customers' feedback. Looking ahead, we will conduct more formal surveys; however, in this community, our experience has been that in-person communications has built a strong customer-service relationship that has been key to our current success.

Contact Michael Palladino at mikep@isc.upenn.edu.

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We created a website, http://louisville.edu/it/ittechconnect, to let students know about the service and to help link them out to other related services they may need.

Information Technology also actively works to promote digital literacy in underserved populations through a unique partnership with University of Louisville's Family Scholar House. The Family Scholar House provides housing and childcare support to single parents pursuing a four-year degree. IT regularly contributes repurposed computing equipment, desktop support services, and technology training to resident families. A video detailing Information Technology's work with the Scholar House is located at http://louisville.edu/television/it/Scholarhouse.aspx.

ACUTA: Since higher education seems to be perpetually in challenging budget times, what is your most important financial issue? How are you addressing it on your campus?

Hancock: The University of Louisville has faced 10 budget cuts in 10 years, and we are facing our eleventh consecutive year of cuts. The current economic climate only exacerbates the previous decade of cuts. We are still responsible for meeting increasing operational demands with reduced funding, the paradox being cost-saving endeavors require an initial investment upfront. We have learned to get creative with our project funding, scheduling financing repayments to match cost savings as they balloon. Of course, the latest hurdle is getting financing in these fiscally challenging times.

ACUTA: Aside from funding, what issue are you, as the CIO, currently spending most of your time addressing?

Hancock: Without a doubt, our aging data center is one of the biggest issues we face. The data center has adequate floor space for new systems, but is severely constrained by limits on available power and cooling. Although strategies such as server virtualization are being used to reduce the number of systems in the MITC data center, we need to modernize it to support future technology growth.

ACUTA: What is the impact of this issue for your campus? What is your strategy for addressing this issue?

Hancock: The most immediate impact is the inability to move forward on expanding UofI's research computing infrastructure. Our high-performance research-computing cluster is already utilized near 100 percent capacity on a regular basis. In order to expand, we need our data center to easily support the power and cooling needs presented by high-performance computing.

We are evaluating multiple strategies to modernize our data center. We are looking at the viability of upgrading the data center, using virtual servers, expanding into alternate space on campus, building a new facility, using container modules in lieu of building, co-locating facilities, using managed services, or outsourcing applications to vendors. Any option that does not involve owning the facility will be a culture shift for the organization and campus.

ACUTA: Given that a key function of the CIO's responsibility is preparing the campus to support future technologies, what technology changes do you see for your campus as you look forward five to seven years?

Hancock: Given the speed with which technology changes, I prefer to look ahead two to three years. As mentioned above, flexibility is key. The pace of technology renders "early adopters" obsolete. As technology changes, our constituents look to us to immediately change along with it.

Virtualization of servers, storage, and desktops is another attractive approach for the University of Louisville. We can be more strategic with our hardware investments by promoting off-campus "clouds" and software as a service when it is feasible and beneficial to do so.

ACUTA: How are you readying the campus for these changes?

Hancock: Information Technology takes our show on the road, so to speak. We prepare the university community for major technology changes by organizing open forums, presenting to multiple constituency groups, forming steering committees with constituency representatives, and conducting surveys and focus groups. We continuously tell our story and solicit feedback. We create transparency and promote collaboration. We talk, but more importantly we listen and respond. That alone has made all the difference at the University of Louisville.

Thanks to Priscilla Hancock for taking the time to share her responses to these questions. You can reach her at pahanc01@louisville.edu.
Q & A with the CIO

ACUTA: Much of the technology we now support in higher education is driven by consumer electronics. What decisions about your technology infrastructure have been affected by this and how?

Hancock: Mobility is a key driver behind infrastructure and service decisions at the University of Louisville. Students, faculty, and staff bring a wide variety of devices to campus for countless reasons. The lines between devices are now blurred. A few years ago, Internet-capable devices could be classified as either a smartphone or a laptop. Now we have devices that deliver "apps." New device categories will continue to hit the market with increasing rapidity.

Our job is to maintain a flexible, yet secure, infrastructure in preparation for any device, anywhere. IT is deploying end-to-end encrypted pervasive wireless. We are building our websites for better distribution on mobile devices. We are rolling out e-mail services that seamlessly integrate with the Web on a multitude of devices. We even have a specific area, Next Gen Services, dedicated to staying on the cutting edge in Web, mobile, and application development.

ACUTA: Freshmen at most institutions today are far more extensive users of technology than those of even five years ago. What is the most challenging technical aspect this presents for your campus?

Hancock: The largest challenge is the assumption that all of our students are proficient technology users. As an urban institution, we need to be continually aware of the digital divide in our student body. While most of our students are technology leaders, a small subset grew up in homes without a broadband connection. As a technology organization, we need to find creative, engaging ways to close the digital divide. Because we support a large research institution, it is a given that some of our students will run circles around our technology capabilities. The natural inclination is to keep pace with the leaders; however, our focus on the next big thing should never force us to leave the technologically underserved behind.

ACUTA: In what ways has this affected how you deliver support services?

Hancock: Over the past few years, Information Technology has removed the literal and metaphoric barriers between our staff members and students. We renovated our building to create a welcoming environment, inviting students into our space to share knowledge and ideas. We renovated an outdated computer lab to include collaboration areas and technology peer tutors to bridge the digital divide.

In essence, we really wanted to demystify technology for our student users. We created a free face-to-face consulting area, iTech Connect, where members of the university community can talk to a technology consultant in person regarding campus technology questions or issues. Face-to-face consulting has provided invaluable support to the international students on campus, overcoming language barriers both interpersonally and in the technology the students bring with them.

continued on page 39
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