

Will the Real Digital Native Please Stand Up? p.26

# CAMPUS TECHNOLOGY

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October 2011

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# The Eye of the Storm

Consumer IT and student expectations are bearing down on higher ed, whether it's ready or not.

The eye of Hurricane Irene passed almost directly over my house in Virginia. While it caused far less damage than we had originally feared, we (like millions of others) did lose power. And for the 12 hours that we were off the grid, my family didn't miss a beat. Sure, we couldn't flush the toilets (no well pump), but what does that matter when my wife could still use her iPad to read e-mail, and my children could check weather sites for the latest wind speeds? It's at times like these that you realize how useful mobile technology can be—and how embedded it has become in our lives.

Indeed, the storm finally convinced me how impossible—and misguided—it would be for colleges and universities to try to wall themselves off from these devices, out of security concerns or because they are seen as distractions within the traditional classroom. Whether we like it or not, students are arriving at campus with a slew of mobile gadgets, and they fully expect to use them in their interactions with their school, their professors, and fellow students. And so they should. To pretend otherwise is the modern equivalent of sticking your finger in the dike. The days of central IT being able to control the tech chain from beginning to end are over (see "The Consumerization of IT: Pendulum or Wrecking Ball?" on page 32).

It was just 10 years ago that Marc Prensky popularized the term "digital native" to describe the generation of students who grew up marinating in

this modern stew of technology. While his original thesis may have had its flaws (read "Will the Real Digital Native Please Stand Up?" on page 26), his understanding of how technology would change our lives and the way we learn was spot-on. Today, be it in a hurricane or an economics class, we look to the web first for our information. It's just so convenient—it's there when we need it.

And as mobile devices have become cheaper, smaller, and easier to use, we are extending that web dependency to every facet of our lives. I say "we" because, despite Prensky's assertion that this is an evolution confined to the young, most of us today are digital natives, regardless of age. We may use technology in different ways, in different amounts, and with different skill levels, but, for the vast majority of us, technology—and the web in particular—is an integral part of our lives.

In responding to this new reality, higher education faces significant challenges. IT departments must find ways to secure their networks even as they loose the wild animal of consumer IT. And faculty must come to terms with the fact that they are no longer the sole source of knowledge in their own classrooms. There really is no other alternative. Just ask my son. His response when the power came back on after the storm? "Oh, good. I can recharge the iPad." Guess who had to go 'round flushing the toilets? **CT**  
 —Andrew Barbour, Executive Editor  
[abarbour@1105media.com](mailto:abarbour@1105media.com)





## A New Way Of Teaching

**L**ecture capture has become invaluable for students in large lecture courses at large universities: The technology enables students to view lectures again and again, replay complex topics, and generally improve study time across the board.

And according to academic technologists at William Paterson University (WPU), lecture capture is equally successful in small-class settings at smaller institutions.

WPU has used lecture capture from Tegrity to help students make better use of their class time—and their study time between classes. Because the school doesn't offer many big lecture courses, the technology has been tested in classes of 35 to 50 students, and has worked wonders.

### Changing landscape

The 11,000-student liberal arts college in Wayne, NJ, was an early adopter of Tegrity's lecture capture technology, rolling out the first iteration in 2003. Since then, its use on campus has grown gradually but steadily.

According to Sandra Miller, director of instruction and research technology, it has spread mostly by word of mouth: "When educators are excited about something, they talk to each other," Miller says. "In the case of lecture capture, we didn't have to work hard to convince them this was something they should use—rave reviews spoke for themselves."

Case in point: The number of instructors using Tegrity has more than tripled since

the first pilot program eight years ago, and looks to expand even more during the upcoming school year.

Students are excited about these developments too. In a Fall 2009 survey, 75 percent of the students reported that they would like to use Tegrity to study for other classes. Students told surveyors the new technology helped them notice things they had missed in class, and was particularly useful in preparing for finals.

### Improvising innovations

While most WPU professors traditionally have used lecture capture to make course lectures accessible to students outside of class, a number of them also have begun tailoring the technology for other uses in their respective disciplines.

One professor used Tegrity to record a series of tutorials about Microsoft Excel; another recorded the step-by-step process of solving complex math equations so students could go back and review how these particular problems were solved.

Elsewhere on campus, a linguistics professor recorded himself speaking in Old and Middle English—then referred to the recordings to help improve his own teaching of the subject.

In another class, a professor assigned student teacher candidates the task of making Tegrity recordings, and then had the class critique them in a form of peer review.

Such innovation helps the technology grow on campus, says Miller. "To see our instructors embracing lecture capture in all of these different ways is an encouraging sign that even more change is coming."

### Facts don't lie

In the fall of 2010, Miller spearheaded a student-user survey to gauge how students really felt about Tegrity technology.

The results overwhelmingly indicated the benefits of lecture capture at William Paterson University. Of the students surveyed:

- More than 81 percent said the technology had increased their depth of learning.
- 73 percent said they would request that their professors record class lectures using Tegrity.
- More than 90 percent said they would recommend using Tegrity to their classmates.

"It's clear this is making a difference for students, as well as faculty," says Miller, who will continue to assess Tegrity's impact on campus.

### Down the road

This data is only the beginning. According to Miller, WPU plans to offer more Tegrity classes in the 2011-12 school year. What's more, a number of administrative offices are beginning to use it to distribute mini-tutorials on other technologies, such as online degree evaluations. "The possibilities are endless," Miller adds.



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## Viewpoint

### "Narrate, Curate, Share": How Blogging Can Catalyze Learning

A new blogging initiative at **Virginia Tech** encourages students to "narrate, curate, share" their stories of learning.



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# 12 Cool-laborative Web 2.0 Tools

In the rapidly evolving world of web 2.0, four experts offer their picks for the latest and greatest collaborative tools for classroom use.

**KEEPING UP WITH** the flood of web 2.0 applications can be a dizzying affair. Winoing the worthwhile from the worthless can eat up time that you simply don't have, yet the instructional advantages offered by the most promising collaborative tools are too big to pass up. To help steer you in the right direction, *CT* asked four self-confessed web 2.0 junkies (meet our panel on page 12) to share their 12 favorites—some still in beta and some that have stood the test of time (well, a year or two anyway).

**1** **AMPLIFY** (*amplify.com*)  
*Application: Social blogging service*  
 See an article, photo, blog, or video that piques your interest? Amplify lets you clip, share, and spark conversation about it. Amplify's web clipper quickly snips information, sucks it into your browser, and spits it out wherever you choose. To use Amplify as a one-stop shop for all your social media sharing, sync it with your social networks and blogs. Educators who place an emphasis on high-interest tools that are fun and simple are calling Amplify super-quick and more substantial than Twitter.

**2** **AUDIOBOO** (*audioboo.fm*)  
*Application: Mobile/web platform for audio recording/uploading*

Use the Audioboo website or the downloadable app to record, listen, or share five minutes of audio from your phone or computer. You can save recordings as podcasts or RSS feeds, too. Alexandra Pickett, associate director of the SUNY Learning Network, uses Audioboo to give oral feedback instead of written review, which she believes leads to increased learning and engagement. Being able to make audio comments is also a huge time-saver, she claims: "Boos make my feedback richer and more extensive, my teaching and social presence more meaningful."

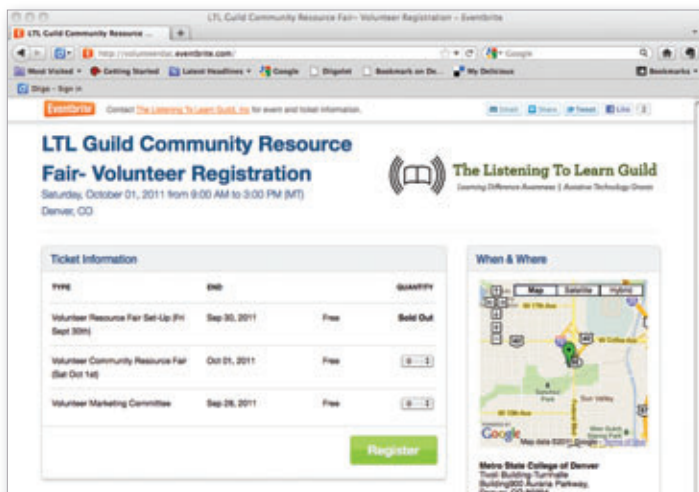
**3** **DROPBOX** (*dropbox.com*)  
*Application: Web-based file hosting service*

Download Dropbox and automatically sync your files with the cloud. Uploading from one computer updates your other devices, so working from multiple locations is effortless. Plus, files get unique URLs for easy sharing. Store 2 GB for free, and then use your .edu address to refer a friend for more.

"Cloud storage makes my files available anywhere, across multiple platforms," says Mark Frydenberg, senior lecturer of computer information systems at **Bentley University** (MA). He uses Dropbox to share large files and links to graded assignments without the usual e-mail exchanges.

**4** **EVENTBRITE** (*eventbrite.com*)  
*Application: Online event management and ticketing*

Like many other campus organizers, Matt Brinton, interim assistant director of student activities at **Metropolitan State College of Denver**, uses Eventbrite to promote events of every size. Organizers establish registration pages listing event details, times, and ticket options. A ticket widget allows event organizers to sell tickets from their own website, with multiple payment options available. Public events go into the Eventbrite directory and on search engines. Brinton likes Eventbrite's extensive interactivity and analytical capabilities,





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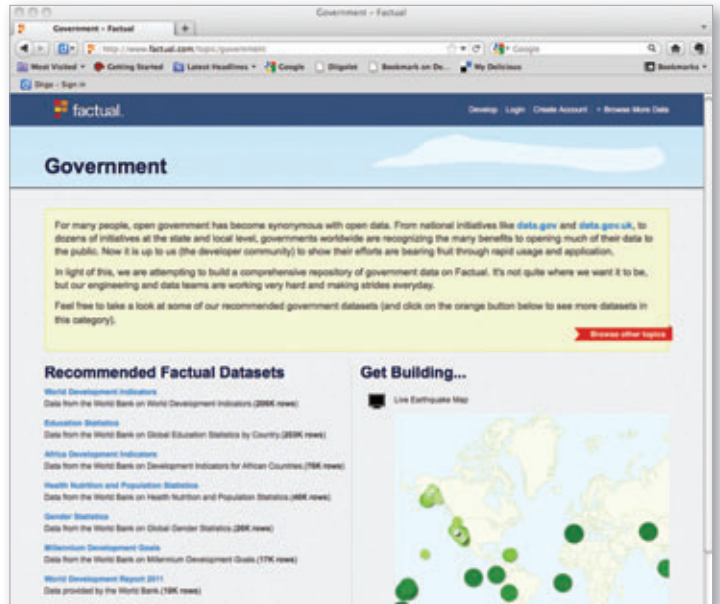
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which let organizers gain a better understanding of event attendees—a service not offered by Evite.

**5** **FACTUAL** (*factual.com*)  
Application: Data as a service

Factual is an open data platform for web and mobile applications. It supplies live data on numerous topics mined from research submitted by users or provided by developers and partners. Data can be downloaded as a CSV file or manipulated online through a free server API. “Data as a service is one of the up-and-coming uses of the web,” says Frydenberg, who recommends it for student projects because it’s easy to access real-world data, make it your own, and embed mashups on a web page.



**6** **GLOGSTER EDU** (*edu.glogster.com*)  
Application: Online collaborative learning platform

Glogster allows users to create interactive posters that demonstrate their understanding of specific topics. “Even the most resistant technology learners end up loving Glogster,” says Kimberly LaPrairie, coordinator of the Master of Education in Instructional Technology program at **Sam Houston State University** (TX). “It takes them back to the poster presentation, but it’s so much more interactive. Glogster motivates individuals to explore topics by allowing them to incorporate audio, video, links, text, and images.” LaPrairie has presented entire programs using Glogster, including her department’s student-intake review.

**7** **JOIN.ME** (*join.me*)  
Application: Screen sharing

Enter join.me in your browser, and you’re on your way to sharing your screen with anyone to whom you give

the access code. Join.me also allows you to transfer control to others so they can interact with applications running on your screen. A phone conference feature lets everyone looking at your screen dial in to a common call.

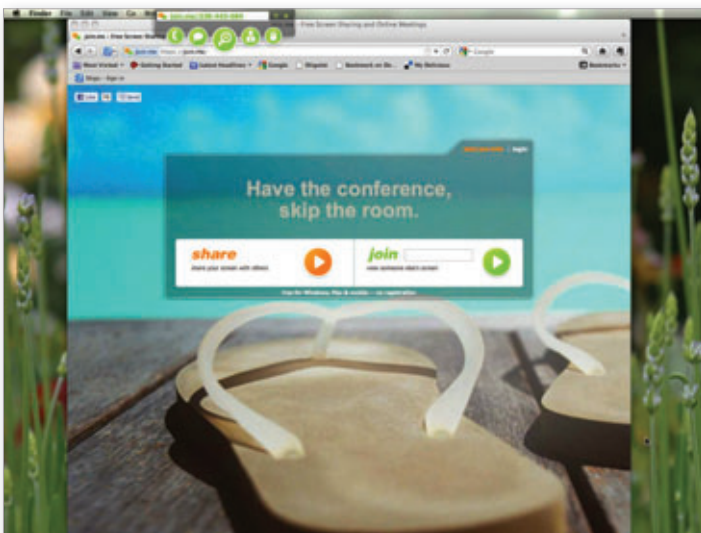
“Instead of canceling class during a snowstorm, I met my students virtually,” recalls Frydenberg of one instance when he used the application. “They met me on join.me, where I shared my screen, and we all called in to listen to the conversation. I called on students in the chat room who had questions, and asked individual students to complete different steps of a software demonstration.”

**8** **JUMPSCAN** (*jumpscan.com*)  
Application: QR code generator

Use JumpScan to create a personal Quick Response code that’s linked to your digital world. Anyone with a smartphone and QR reader can take a picture of the code to access your contact information, social media feeds, websites, and pictures. SUNY’s Pickett puts her JumpScan QR code on her course preview page, allowing prospective students to access her name, picture, blog link, and personal information. “By scanning my JumpScan QR code, students get to know me before taking my course,” she says.

**9** **PBWORKS** (*pbworks.com*)  
Application: Real-time collaborative editing system

PBworks is a hosted collaboration site where individuals set up 2-GB workspaces with a front-page wiki and safekeeping for assignments that can be edited by others. PBworks keeps track of each editor who contributes to the project; any changes can be reversed with one click. Instructors maintain administrative control and student accountability, while students customize their workspaces and add multimedia content with PBworks plugins. LaPrairie’s students use PBworks to organize work, showcase web 2.0 projects, and construct web pages.





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**10 QUORA** (*quora.com*)  
*Application: Social Q-and-A*

Twitter-like in its ability to update and query followers, follow others, and link to social media, Quora (currently in beta) stands out for tracking not only people but also topics and questions. "People flock to your topic, not necessarily to you," Pickett explains. To tap into the collection of questions and answers created, edited, and organized by everyone who uses it, simply sign up for a free account. Once you're set up, find people you know or like, vote up or down responses, and collaboratively refine answers.

**11 VOKI** (*voki.com*)  
*Application: Creator of speaking avatars*

With Voki, you can create an avatar that can speak up to one minute of a recorded or typed message. The avatar can then be embedded in blogs, e-mails, social networks, and more. "My Voki avatar helps students get to know and trust me, which in turn creates community and enhances collaboration in my online course," explains Pickett.

In LaPrairie's online classroom management course, Voki helps her get to know students. "They don't have to show their real faces, but they can still be heard," says LaPrairie, who also finds Voki effective in delivering project critiques.



**12 ZAMZAR** (*zamzar.com*)  
*Application: Utility software*

With so many files zinging around campus, it's unlikely that users will have every program needed to open them all. Web-based Zamzar improves access to information and assists collaboration by converting data, image, video, and music files up to 100 MB in size from one format to another. Type in a URL or upload a file, and Zamzar e-mails back with the URL of the converted file for download. "Sometimes you just need to convert a document to PDF, a video to MP4, a song to MP3, or an image to PNG," says Frydenberg. "Zamzar makes it easy." **CT**

*Alicia Brazington is a freelance writer based in Portland, OR.*

# CT'S WEB 2.0 PANEL.....



**MATT BRINTON**  
 Matt Brinton is the interim assistant director of student activities at **Metropolitan State College of Denver**, as well as the NASPA Region IV-W technology knowledge community representative.



**KIMBERLY LAPRAIRIE**  
 Kimberly LaPrairie is the coordinator of the Master of Education in Instructional Technology program at **Sam Houston State University (TX)**, and an assistant professor in curriculum and instruction. She uses numerous web 2.0 tools in her courses, most of which are completely online.



**MARK FRYDENBERG**  
 Mark Frydenberg is a senior lecturer of computer information systems at **Bentley University (MA)**. He introduced a new multi-disciplinary web 2.0 course that brings together students in both business and liberal arts programs to explore the influences of web 2.0 technologies. He is the author of *Web 2.0 Concepts and Applications*.



**ALEXANDRA PICKETT**  
 Alexandra Pickett is the associate director of the award-winning SUNY Learning Network, the asynchronous learning network for the **State University of New York**. She also teaches Introduction to Online Teaching in the online CDIT master's program at the **University at Albany (NY)**.



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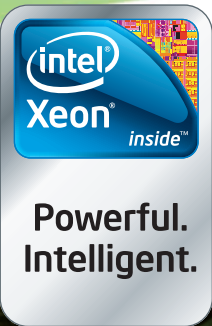
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# Tour de Force

Universities are using cutting-edge virtual tours as a tool in recruitment—and giving prospective students a feel for life on campus.

**REAL ESTATE AGENTS** have used virtual tours for decades, hoping that buyers who get an online peek inside a home will feel compelled to schedule a live showing. Colleges and universities are now using the same strategy, with the goal of turning curious high school and transfer students into new recruits.

Using online video and, in some cases, a back-end system to track these virtual viewers, colleges are giving prospective students a look at their facilities and amenities before they ever set foot on campus. But the most successful tours go beyond just bricks and mortar—they aim to capture what life is like for students, focusing on the overall learning environment.

Dartmouth College's (NH) Thayer School of Engineering started using 360-degree panoramic tours to show off its campus to new recruits in late 2009. Joseph Helble, dean and professor of engineering, says the idea was born after a group of undergraduate students won a Google SketchUp (3D modeling software) contest.

"The competition entailed mapping part of the campus online in a 3D format," recalls Helble. "The end result was a 3D, photographic version of the campus, and we thought it would be great if prospective students could 'step inside' our buildings electronically to tour our facilities."

Developed by Dartmouth's communications group and the IT department, the virtual tour is based on panoramic photography and video clips taken by an in-house photographer. Students were involved in the process, suggesting ideas for the video content, angles, and coverage.

Most of the college's interior areas, and some of its exterior, are represented on the tour. "To do our entire facility would have meant showing offices and research laboratories, but we didn't want to open those up to an online audience," Helble explains. "Instead, we stuck to the common spaces, classrooms, project laboratories, and areas where we could show student teams working on open-ended design projects."

## Tackling the Challenges

Creating and uploading the virtual tour was straightforward, although the college's aggressive timeline of just eight months created a time crunch. "In January it was little more than an idea, and by September it was up and running," says Helble.

Key steps included shooting the campus footage (both static photos and videos), stitching the content together into a cohesive video clip, and then editing the final product using Apple iMovie. The panoramas that form the visual background for each room were assembled using PTGui software, and displayed using Krpano Panorama Viewer.

"The video went through a few iterations before it was ready to upload to our website," recalls Helble. "We would prepare a set of video clips for a particular room, review them to see if they told the story we wanted to tell, and then edit or shoot new content to build the collection we ultimately posted."

The video is continually honed to ensure that it stays fresh and relevant for its audience of prospective freshmen. Students in some project-oriented classes, for example, film their work and show a short video as



THE VIRTUAL TOUR at Dartmouth College's Thayer School of Engineering uses panoramic photography and video clips to capture what life is like for students on campus.



# CAMPUS TOURS GET SMART

**Augmented reality, QR codes, and interactive games let students take campus tours into their own hands.** By Jennifer Skelly

**IT'S A TIME-HONORED TRADITION:** The summer between junior and senior years, high school students and their families pile into minivans and trek across the country to tramp the quads of prospective colleges. It's a pattern that's unlikely to change anytime soon, but how students actually tour campuses may be evolving.

While many universities woo prospective students with online virtual tours, interactive maps, and 3D fly-throughs, there is a recognition that most students—except those living far away—will also visit the campus before enrollment.

When it comes right down to it, students want to know what life on campus is *really* like, and technology can't re-create the feeling of being there. "There's something intangible that you can only get on campus," notes Colenn Berracasa, admissions counselor at the **University of California, Santa Barbara**.

If technology can't compete with real-world experiences, it can certainly enhance them. With the explosion of smartphones in society, new opportunities for self-paced, self-guided exploration

**Stickers on Tufts' map displays bear both a URL and a QR code, allowing students and visitors to download maps to their smartphones.**

are popping up. UCSB's Office of Admissions, for example, created a self-guided tour using the social location-based game SCVNGR. Students earn points, redeemable at the university bookstore, by exploring the campus and posting updates and photos via social networking sites.

In many ways, the university gets a two-for-one deal: A prospective student tours the campus, plus lots of other potential students experience the campus virtually. Anil Gnanamuthu, admissions counselor and coordinator of campus tours, hopes the tour will appeal to visitors who—for whatever reason—don't participate in group tours. "Most people want the guided tour," he says. "The game is for when they can't make it."

## Maps to Go

Almost every university uses signage—either traditional or digital—to display campus maps or building directories. But you can't exactly take the display with you, and what kind of high school dork wants to be seen on campus with a printout? To alleviate such teenage angst, **Tufts University** (MA) has affixed stickers to its map displays that bear both a URL and a Quick Response (QR) code, allowing students and visitors to download maps to their smartphones (way cooler!). For schools with digital signage, adding a QR

code or Microsoft Tag is even easier.

"You can create a tag that points to any URL, website, or even a vCard if you're looking for a professor," says David Levin, president of Four Winds Interactive, a digital signage company that has begun incorporating Microsoft Tags into its displays. "As more and more individuals carry devices, they often want to take the information with them on their phones."

Smartphones are also capable of displaying the very latest in cutting-edge tour technology—augmented reality (AR). AR allows a developer to enhance a real-world image by overlaying computer-generated information. When a user points his phone's camera at a building, for example, GPS determines the user's location, prompting images, text boxes, and other data to overlay the real-time camera image.

Today's AR smartphone tours are a lot simpler than the first AR campus tour created at **Columbia University** (NY) in 1997. Back then, users were outfitted with a head-mounted device, a backpack with a GPS antenna, and a handheld computer display.

Layar, an Amsterdam-based company, has developed a mobile AR platform that allows users to create and publish their own AR "layers": images, text, audio or video files, even animation. And because anyone can publish a layer, campus guides are starting to crop up in higher education, including at **Purdue University**

(IN), the **University of Wisconsin-Madison**, and **Ryerson University** in Toronto. At UCSB, about one-third of the campus is mapped onto a Layar app. Students and visitors walk around campus using their phones to view buildings labeled with a blue dot. Tapping the dot loads additional information about the building on screen.

Not everyone is convinced that AR tours are ready for prime time. Dave Olsen, a technologist at **West Virginia University**, developed a campus guide using Layar in December 2009, but never went public with it. WVU is an expansive campus: On Olsen's tour, every building within line of sight had a blue dot, and the interface became unwieldy. While he likes the idea of an AR guide, he feels its usefulness is limited by bandwidth, screen size, and the current capabilities of smartphones.

"The good thing about a campus tour is the experience—that's what you're selling," notes Olsen. "I'm not sure anyone's been able to do that yet [using a mobile app]. I think it can and will happen, we're just a little ways out. What students really want to know is, 'What's the vibe and how do I fit?'"

*Jennifer Skelly is a screenwriter and freelance journalist in Los Angeles.*

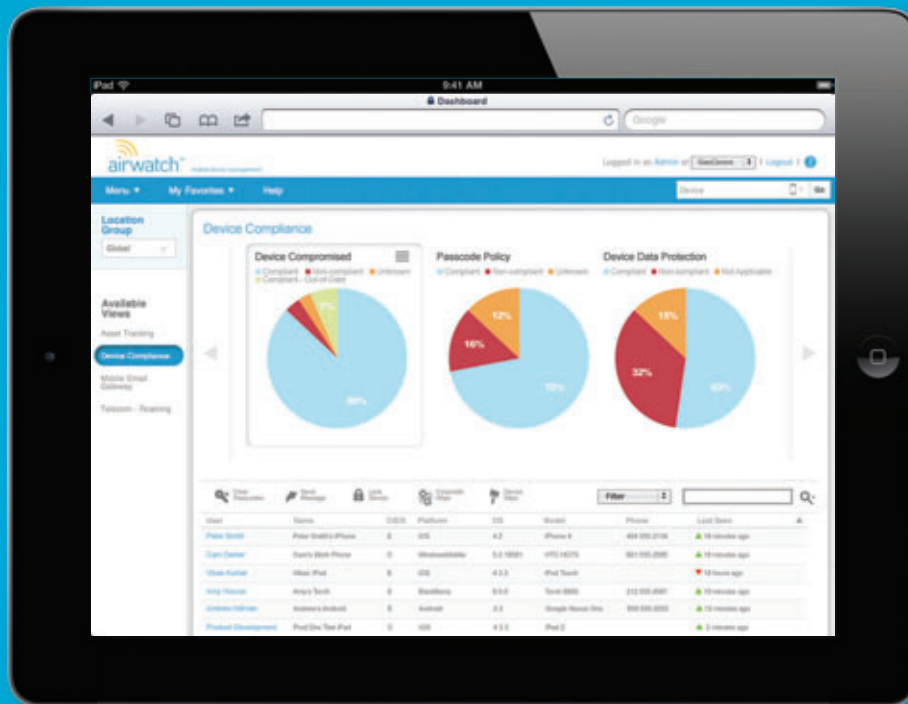


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part of their final presentation. The communications staff makes arrangements with faculty and students to obtain some of this content, which is then edited into the virtual tour during regular updates.

Over the past year, the site has attracted approximately 6,000 visitors, with the average individual visiting five to six rooms, as well as watching videos and slideshows and reading fact boxes describing the school and its programs.

With the core virtual tour in place and updates handled on a regular schedule, the next step will be to integrate a system for tracking potential recruits who view the online



**“In many cases, we know more about the ‘virtual’ prospects than we do about those who walk through the campus in person.”**

—James Maraviglia, Cal Poly

tour. “We’re talking now about how we can do a better job of tracking utilization,” says Helble. “We haven’t closed the loop yet and asked students if they feel this played a role in their decision to visit and apply.”

**A Recruiting Package**

While Dartmouth’s plans for a tracking system are still on the drawing board, **California Polytechnic State University**, in San Luis Obispo, has tied its virtual tour to the school’s customer relationship management (CRM) program. The program automatically creates a dynamic VIP microsite for each student prospect, based on his individual attributes. The underlying philosophy is that a student’s decision to visit—and ultimately enroll—is driven by multiple contact points, of which a virtual tour is just one element.

All prospective students have their own username and password that allow them to sign on and see their own dynamic information at any time. According to James Maraviglia, associate provost for marketing and enrollment development, the VIP microsites include streaming video messages from a number of campus sources, such as academic department chairs, as well as current and former students.

Cal Poly collects personal information, including name and address, about all its prospects. “We use the CRM to manage the relationships throughout the lifecycle—from the time prospective students view the tour until they are accepted for admission,” says Maraviglia. “In many cases, we know more about the ‘virtual’ prospects than we do about those who walk through the campus in person.”

The university launched its first “virtual viewbook” online in 2003, having previously sent CD-ROMs to prospects. It

**RESOURCES**

For links to the products and vendors mentioned in this article, visit [campustechnology.com/1011\\_tours](http://campustechnology.com/1011_tours)

has been honing its strategy ever since. Its communications team, primarily comprising students working with the associate director, captures the footage, which is then used to create new tours and update existing clips.

“They shoot a lot of video, which is used across various multimedia channels on campus,” says Maraviglia. “It’s all

part of our web presence.” The associate director handles the stitching and editing of the tours, which are then uploaded to the appropriate university web pages.

Maraviglia says the university’s virtual viewbook includes campus tours, video footage, and other tools that give students an inside look at Cal Poly. With 90 percent of the university’s new students hailing from more than 100 miles away, the tours—combined with the robust CRM system and a method for monitoring progress—have played a role in the university’s growth.

“Many of our peers are still in the direct-mail days, but we haven’t produced a paper brochure in over a decade,” says Maraviglia. “This hasn’t hurt our applicant pool at all. In fact, it’s grown from 20,000 to 40,000 over the last 10 years. We credit our digital strategy—which includes our virtual viewbook—with stoking much of that growth.”

To other schools that are thinking about developing virtual tours, Maraviglia says it isn’t enough to simply upload a video to a college website. You must also manage the relationship with the prospective student, he insists. And the best way to do that is with a robust back-end system.

“One hand has to know what the other one is doing,” he says. “Without that piece, you’ll have no idea whether your virtual tour strategy is working or not.” **CT**

*Bridget McCrea is a freelance writer in Clearwater, FL.*

**WEB EXTRA**

For a full description of how **Dartmouth College (NH)** created its virtual tour of the Thayer School of Engineering, visit [engineering.dartmouth.edu/thayer360/how.html](http://engineering.dartmouth.edu/thayer360/how.html).



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For about 25 years, magnetic stripe cards, which resemble credit cards and follow ISO standards for security and privacy, have been by far the most prevalent card technology for making purchases on campus and at participating merchants off campus.

But contactless cards, which have an embedded microchip and antenna, are steadily gaining. With contactless cards, a user simply holds the card near the reader to open a door or make a purchase, which means the card can stay in the user's wallet or handbag. Contactless cards are less prone to damage (i.e., wear and tear from frequent use or exposure to weather and grime), duplication, and hacking.

Most experts agree that contactless cards will replace magnetic stripe cards over time. In the meantime, though, schools that want to take advantage of the new technology without abandoning their existing system have a third option: the mag stripe/contactless hybrid.

Taran Lent, vice president of product management and development and cofounder of CardSmith, a campus card solution company, recommends that schools not abandon mag stripe entirely—at least not yet.

"If you have an off-campus program, most of the terminals and POS systems of merchants on Main Street are really mag stripe based," explains Lent. "Trying to get those merchants to switch to contactless readers and incur those costs might be a big challenge. There's really no incremental cost in having the mag stripe there in case you need it. Once you're paying the \$3 or \$4 apiece for the contactless card, you can get a mag stripe on it for 10 or 15 cents."

Still, cost can be an issue: Contactless cards cost from \$3 to \$10 each, depending on their quality and the number of applications that are included. In comparison, magnetic stripe cards cost less than a dollar.

According to Lent, implementation of contactless technology is also slowed by the lack of a global standard, something that makes the mag stripe card efficient and easy. "The contactless



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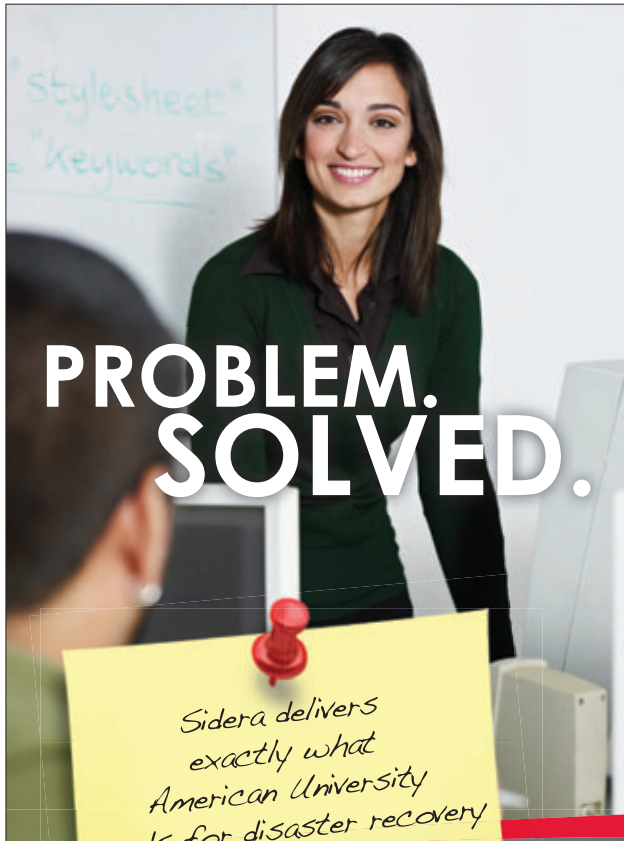
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card is still a bit of the wild, wild West," he explains. "A lot of technologies are competing to become the leading standard. It's tough for merchants because they only have so much counter space and the acceptance technologies can be expensive."

When local organizations do move to contactless cards, universities should try to get involved up front to ward off possible compatibility issues. For example, **American University** (DC) is currently talking with the Washington Metropolitan Area Transit Authority about its impending move to a contactless card system. "Otherwise, Metro might switch to a card technology that isn't necessarily compatible with what we have, but could be if we did a little planning," says Michael McNair, director of public safety at AU. "When Metro updates to its new card, our game plan is to have the student ID card serve the same purpose: Students will simply go to the Metro machines and dump money onto the card and use it as they would a Metro fare card."

### Going Contactless

Because there are so many options, adopting a contactless card program requires collaboration both on campus and off.

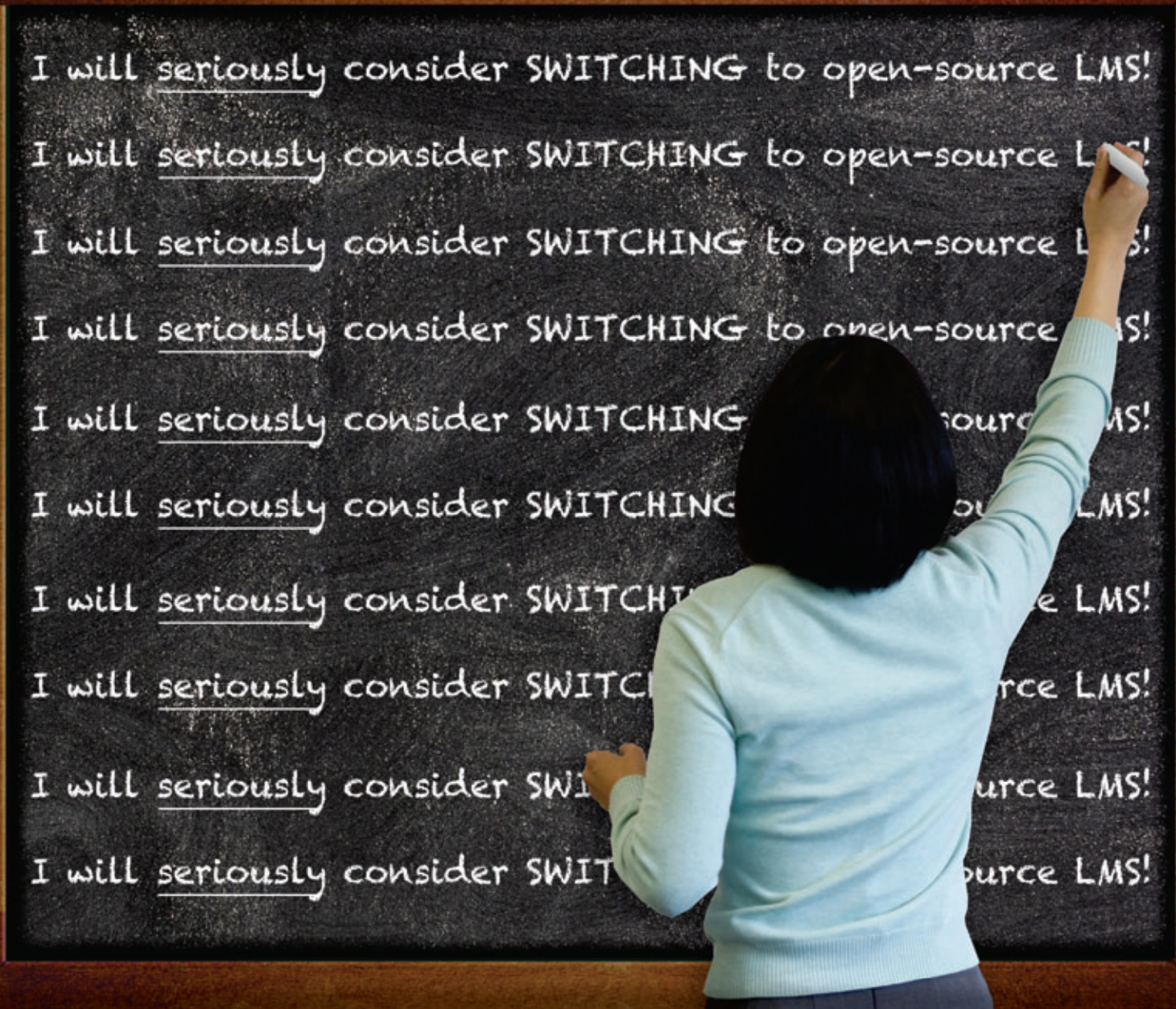
"You need to get all the major players—all the people who would ever need to use the ID card—and make sure that you have a strong, collaborative program," says McNair. "You're going to need your IT section in there to handle the server issues, and you need to make sure everyone is on the same page; otherwise, you'll end up with one person changing a system around, and then the students have to get another card or another device."

Last year, AU installed around 300 Salto locks on campus for use with MIFARE Classic contactless cards (MIFARE is NXP Semiconductors' trademark for a series of chips commonly used in contactless cards). Two hundred went into dorms, and the rest in buildings around campus.

McNair considers the contactless card program a big success—first and foremost because the cards improve security. With mag stripe readers, he notes, users tire of taking out their cards to swipe them, and start propping open high-traffic doors instead. Because the contactless cards are easy to use, door-propping has decreased—doors are essentially locked all the time, even when a student is just going down the hall to visit a friend. "We haven't had one theft from the rooms with the Salto locks," boasts McNair.

In addition, because the cards are tracked through a database, it's much easier to manage access privileges. When students leave campus, they take their IDs with them, but the cards are deactivated via the database. When students return, the cards can just as easily be reactivated. If someone loses a card, the card is turned off in the system, and a new card is issued. This system is also less costly to manage than the traditional lock-and-key system used on





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the rest of the AU campus, McNair says, and if a card falls into the wrong hands, it's pretty much useless.

**Security and Safety**

Contactless cards are also much harder to hack, notes Diane Tatterfield, assistant director of CatCard Services at the **University of Arizona**. "The MIFARE Classic was hacked, but by a group of 30 students over a nine-month period," she says. And the next-generation MIFARE DES-Fire cards boast even more security features.

"The DESFire could get hacked one day, but it's very well encrypted," points out Tatterfield. "Right now, on MIFARE Classic, it's one stream of binary code. On the DESFire, it's three streams. So if you crack one, you still can't get in because you still have two more."

While nobody's going to hack an ID card just to get chips from a vending machine, some campus cards provide access to sensitive facilities—requiring an extra layer of security. For example, the University of Arizona, which hosts the Steward Observatory Mirror Laboratory and a number of other prestigious research facilities, uses biometrics on MIFARE DESFire proprietary chips for access to high-security areas.

"The system takes 32 minutia points of the fingerprint and creates an algorithm so that the authentication takes place between the reader and the card and the fingerprint, and then the card number is shot off to the access control company," says Tatterfield. "If you're authorized to get in, the door opens. But the authentication takes place at the door, and not in a database," she adds, which means the biometric data are less vulnerable to hackers.

The security features of a card system can also contribute to overall campus safety. Campus card vendor CBORD, for instance, offers a notification system that can send messages by text, e-mail, and audio broadcast in the event of an emergency. "If something were occurring in a building and we needed to notify everyone who had gone into the building, we would know based on the access control log who had gone in and out in the last hour, five minutes—whatever we needed to look up," says Read Winkelman, vice president of

sales for CBORD. "And with the right systems in place, we could send them a message." **CT**

*Michelle Fredette is a writer and editor who splits her time between Portland, OR, and Seattle.*

**RESOURCES**

For links to the products and vendors mentioned in this article, visit [campustechnology.com/1011\\_IDaccess](http://campustechnology.com/1011_IDaccess).

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Both cameras boast Super35mm sensors, which facilitate sharper images, even in shallow depth-of-field. Videos have a cinematic feel, making them look infinitely more expensive and sophisticated than they likely are.

The cameras also feature Zebra, a critical component for setting exposure.

The NEX-FS100 is the newer of the two cameras boasting similar features and the same imager as the PMW-F3. This compact, modular camcorder has a detailed viewfinder for critical shots, auto-focus, and reduced rolling shutter effects. It comes standard with a host of image-manipulation tools ideal for digital motion picture productions.

The NEX-FS100 also features HDMI output jacks, and two built-in XLR input



connectors, which make audio quality second to none. It even offers expanded focus so users can fine-tune images on the fly.

The PMW-F3 also utilizes the same top-of-the-line XDCAM file-based technologies that many professional newsrooms, reality television producers, corporations, and educators use today. It also lets users tweak paint profiles to the exact color palettes they desire and save settings to replicate those palettes down the road.

Other standard features include a time-lapse mode, a picture cache, an internal buffer, and the option for manual exposure. What's more, the PMW-F3 has special buttons called "assign buttons" that users can customize to control those advanced functions that require multiple clicks and data input.

Sony offers optional upgrades for the PMW-F3, too. One enables users to link two F3 cameras together and run them in tandem for 3D shooting.

## Building curriculum

One of the best attributes of the two new cameras is ease of use. Workflows are intuitive, instructions are coherent.

From the perspective of curriculum-building, certain features on each camera lend themselves to cooperative learning.

On the NEX-FS100, a dual-recording feature lets users record one session to

two different forms of media storage. This is a benefit for collaborative projects where students have to work on the file separately. It's also a foolproof way to create backups.

With the F3, users can clone cameras by saving certain settings to a memory card and recalling them upon request. This is ideal in classes where multiple students are using the same camera in different class sessions over the course of a semester.

The NEX-FS100 and the PMW-F3 provide great training. Film students at New York University and the University of Southern California are using these tools. Considering these are the students who will go on to make the movies and news broadcasts of tomorrow, it's safe to say we all will benefit from their training for years to come.

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by John K. Waters

# WILL THE REAL DIGITAL NATIVE PLEASE STAND UP?

*"Today's students think and process information fundamentally differently from their predecessors. These differences go far further and deeper than most educators suspect or realize.... The most useful designation I have found for them is Digital Natives."*

*—Marc Prensky, "Digital Natives, Digital Immigrants," On the Horizon, October 2001*





**A decade after the term 'digital native' was first popularized, educators examine what the term means today—if anything.**





A decade has passed since author, game designer, and educational thought leader Marc Prensky heralded the arrival of a new generation of students whose immersion in information technology distinguished them in fundamental ways from previous generations. Because they had spent their entire lives “surrounded

Prensky’s widely circulated article served as a clarion call to educators, from K-12 to higher ed, to recognize these emerging differences and adapt to them. Many educators remember that, when “digital native” first entered the lexicon, the term provoked a heated conversation about how they should be

## It’s Not About Age

“I remember being really struck by that article,” recalls Helen Chen, a research scientist at **Stanford University’s** (CA) Center for Innovations in Learning. “Since then, I’ve certainly cited Prensky in some of my work. But the question of whether the technology is actually creating students who

**“The problem with Prensky’s assumption is that it’s based on age—on the idea that, because you were born in a certain era, you must be a certain way.”** —Helen Chen, Stanford

by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age,” Prensky wrote in a two-part article published in 2001, these “digital natives” were “no longer the people our educational system was designed to teach.”

addressing the academic needs of students raised in an age of ubiquitous, highly accessible, and swiftly evolving IT—not to mention how they might improve their own use of that technology.

So, 10 years later, has Prensky’s concept of a new generation of tech-tuned students held up to the test of time?

are truly different learners has yet to be answered. The problem with Prensky’s assumption is that it’s based on age—on the idea that, because you were born in a certain era, you must be a certain way. Of course, we know that’s not true. Even among your 20-somethings, there are students who are very tech-savvy and those who are not. The term is a generalization, and the reality is much more nuanced.”

Another flaw in the eyes of some educators is the fact that Prensky labels everyone else as “digital immigrants,” unable to achieve true fluency in the new tech world. “If you limit the conversation to [Prensky’s definition of] digital natives, you have limited yourself to barely a quarter of the head count in American higher education,” says Kenneth “Casey” Green, founding director of The Campus Computing Project. “‘Digital natives’ are the most visible group as we think about full-time undergraduate college students, but they’re roughly 25 to 30 percent of the population. The other parts of the population—adults, full-time workers, people with families—come to campus with, in some ways, even higher expectations and better technology skills. The reality is, just because you can Google, game, text, and tweet doesn’t mean you necessarily have the technology skills for your portfolio.”

Eszter Hargittai, associate professor of communication studies and faculty associate of the Institute for Policy Research at **Northwestern University** (IL), echoes Green’s comments—and says she has the research to prove her point.

“I don’t think the term was ever valid, or

## IS THE REAL DIGITAL NATIVE STILL AT RECESS?

**SOME EDUCATORS BELIEVE** that Prensky’s 2001 identification of an entire generation that’s technologically adept and wired to learn differently was not altogether wrong—but certainly came too soon. Julie Evans, chief executive officer of Project Tomorrow, makes the case that, even though we’ve been talking about digital natives for 10 years, the first wave of true digital natives—kids who have been connected to the internet in school since kindergarten—is just now in middle school. In contrast, even though most of today’s college students view the web as an extension of themselves—and expect to use their devices everywhere—they did not use the web as an *educational platform* until comparatively late in their academic careers.

“Most of the students in college right now probably weren’t connected to the internet at school until almost the seventh grade,” she says. “And among these students, some had internet access at home, and some didn’t. There’s going to be a difference between a student who didn’t take his first test online until the seventh grade and a student who started taking online tests in the first grade. There’s just a range of experience out there that makes it less useful to lump all these students together in one category.”

Evans cautions that this broad spectrum of web experience makes it difficult to use the current campus population as the basis for long-term planning. “If you’re in higher education and you’re developing a strategic plan or making investment decisions based on conversations you’re having with the students currently in your classrooms—or even high school students—you’re talking to the wrong audience,” she warns. “You really need to be talking to third-graders. The high school kid applying to your school today is just not as ‘native’ as the kids further down the pike.”

even very useful,” she says. “It assumes that older people are worse than younger people when it comes to technology. And it seems to assume that all young people are homogenous when it comes to technology use. Neither of those things is correct.”

For about a decade, Hargittai has been studying the social and policy implications of digital media, with a particular focus on how differences in people’s web skills influence what they do online. She started her research at about the same time “digital native” began generating its initial buzz.

“My work has shown over the years that there are, in fact, significant differences among people of the same age when it comes to the skill with which they use digital media—and that age is not necessarily a determinant of skill,” she says, “‘Digital native’ assumes a fluency that ‘digital immigrants’ are lacking. It suggests this grand generational divide, but we don’t have enough empirical evidence to support that notion. It’s just not that simple.”

For her 2007 study, *Digital Na(t)ives? Variation in Internet Skills and Uses Among Members of the “Net Generation,”* Hargittai considered the differences in web-use skills among a universally wired group of more than a thousand college freshman. She surveyed them on the frequency and diversity of their web use, and indexed for skill on 27 variables. She was able to control for two key variables: age and education. Her conclusion: “While popular rhetoric would have us believe that young users are generally savvy with digital media, data presented in this article clearly show that considerable variation exists even among fully wired college students when it comes to understanding various aspects of internet use.”

In other words, Prensky’s digital natives are not equally “native.” Hargittai’s research found differences in information and communication technology skill levels along socioeconomic lines, among races, and even among genders. Higher levels of parental education, being male, white, or Asian-American were factors associated with higher levels of skill in using the web. Students of lower socioeconomic status, women, students of Hispanic origin, and African-Americans exhibited lower levels of web know-how than others.

But, contrary to fears of a digital divide that were first voiced during the mid-1990s, the difference in skill levels does not appear to be related to *access* to technology. “I don’t use ‘digital divide,’ because it’s so black-and-white,” says Hargittai. “Plus, the term tends to refer mainly to the hardware, and nowadays most kids do have access to that technology.”

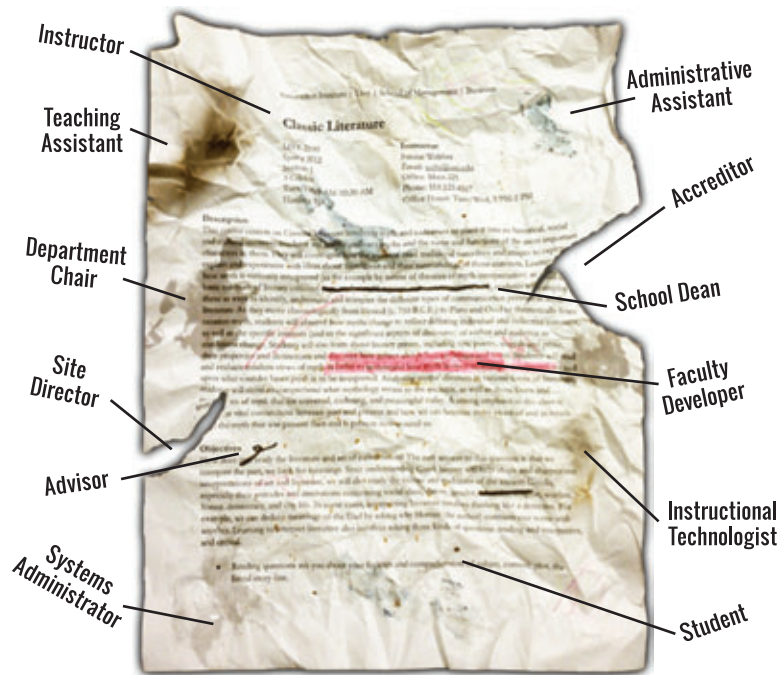
Nevertheless, Hargittai’s study concluded that socioeconomic status is one of the

most important predictors of how effectively people incorporate the web into their everyday lives. Those from more privileged backgrounds simply use it in more informed ways for a larger number of activities.

### Computer vs. Digital Literacy

Seen through the prism of higher education in 2011, Prensky’s definition of tech fluency for those considered digital natives was perhaps too limited. “It’s not just about how

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long people have been using the technology, or how much time they spend with it," says Hargittai. "It's much more about how they're using it and whether they're learning to use it critically and carefully."

Looked at another way, spending 12 hours playing Angry Birds and watching YouTube videos of surfing wipeouts is not the same as evaluating the reliability of source material on sites about the Vietnam War.

Indeed, it might be useful to think of Prensky's definition of digital nativity as the modern tech equivalent of knowing how to type. In the same way that being able to type doesn't make students better writers, understanding how to use tech devices doesn't necessarily make students digitally literate or skilled.

It's a distinction that's certainly not lost on Susan Metros, associate vice provost and associate CIO for technology-enhanced learning at the **University of Southern California**. Metros teaches courses in digital and multimedia literacy, and

has served as principal visual designer on award-winning multimedia projects. She fears that when a term like "digital native" becomes institutionalized, colleges come to expect a uniform level of tech savviness among their incoming freshmen, and may be unprepared for those less "native" students who lack the skills and experience needed to succeed.

"We see that assumption at the university all the time," she notes. "Students are digital natives, right? So they know all about the technology. But the truth is they just know that top layer of the technology. They're digital *dependent* and digital *stimulated*. They know how to text messages and upload a video to YouTube, but in general they don't possess the deeper critical thinking skills they need to be truly digitally literate."

To illustrate her point, Metros cites the evolving nature of visual literacy. "Being visually literate used to mean that you could look at a picture and decode it," she explains. "If you looked at a painting, you could understand what you were seeing,

maybe in context if you've had some art history. If you looked at a sign, you could read it. But the definition of visual literacy has changed because of technology. Now you have to be able to make images—charts, graphs, presentations. Even more important, you have to be able to understand the ethical implications of images you see and post online. That's not something many students get to on their own, no matter how comfortable and capable they are with the technology. It takes *teaching*."

### At Home on the Web

So was Prensky completely off base in positing a new generation of students whose brains are actually wired to learn in different ways from previous generations? Certainly, there is no clinical evidence to back up any claims about physical changes in the brains of today's traditional-age students. But educators

are providing anecdotal evidence of a shift in how students approach learning and education in general.

Metros, for one, acknowledges that access to the web has allowed today's students to evolve a uniquely contextual learning style. "They don't rely on the textbook the way I did when I was a student," she says. "They go to a website and look something up, then they link that instantly to something else, and before they know it they have this broad contextual understanding of the topic. It's actually a very big difference, when you think about it. Ten years ago, students were sort of trapped in the textbook."

And, unlike even recent generations of internet-connected students, adds Metros, the current crop isn't satisfied with merely consuming web content; they expect to produce some of it themselves. Becoming "prosumers" (a blend of "producer" and "consumer") isn't exclusive to digital natives, but it's a very "native" concept.

Ten years after Prensky defined his digital natives essentially as savvy users of a list of hardware devices "and all the other toys and tools of the digital age," it is the kind of web fluency Metros cites that truly defines what it means to be a digital native today, says Ali Jafari, director of research and advanced applications in the Office of Integrated Technologies at **Indiana University-Purdue University Indianapolis**.

"It is how they perceive [the web] that makes them different in my opinion," he explains. "Many older people use the web, of course, but for digital natives the web is an integral part of their lives. They go there first, instinctively. And yes, some are better at it than others. I definitely agree that there is a continuum of capabilities among the digital natives. But if we are talking about what makes them *different* from previous generations, I believe it is this connection to the web."

Julie Evans, chief executive officer of Project Tomorrow, agrees. "They have a very clear sense of the value of the internet and having access to information," she says. "Access is their lifeblood."

Project Tomorrow is a nonprofit focused on improving science, math, and technology in K-12 schools. The group's Speak Up National Research Project

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**“If we are talking about what makes [students] different from previous generations, I believe it is this connection to the web.”** —*Ali Jafari, IUPUI*

polls K-12 students, teachers, parents, and administrators on their thoughts about and use of technology in learning environments. The fact that survey respondents are self-selected may skew its results toward the more advanced end of the web-use spectrum, but the pool of data is nevertheless impressive—more than 2.2 million online surveys have been submitted by participants since 2003.

Project Tomorrow has eschewed “digital native,” says Evans, in favor of the term “free agent learners,” which the group believes more accurately describes a portion of a generation of internet-connected students who aren’t tethered to traditional educational institutions. She says this group of learners is more globally aware, thanks to the internet, and more adept at collaborative uses of the web. She also says that she hears “pretty regularly” from English and social studies teachers that these students are better writers than those from previous generations.

“This generation definitely has a thematic approach to learning,” she says, “which is not about, ‘I’m a vessel—go ahead and fill me up.’ It’s about, ‘I’m the master of my own educational destiny. Give me lots of input and I’ll find what I think is most important.’ Most of the [K-12] schools I talk to still believe that they are the custodians of knowledge. But for these kids, increasingly, [schools] are just one more source of input.”

Even as educators refine and redefine what it means to be a digital native, others point out that Prensky’s 2001 articles nevertheless served as a catalyst in focusing attention on the educational impact of the new digital age. While Prensky’s original definition might not survive close scrutiny a decade later—too generationally focused and without enough attention on *how* students use their devices—he was definitely on to something. “[Prensky’s definition] is a shortcut, so some nuance gets lost,” says

Steve Hargadon, founder of Classroom 2.0, a popular educator-focused social network. “But it was really helpful initially, because it brought up the topic when

nobody was talking about it.” **CT**

*John K. Waters is a freelance writer based in Palo Alto, CA.*

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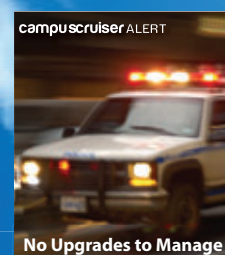
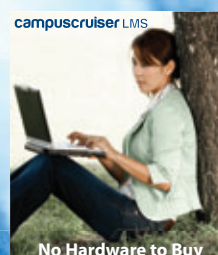
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**The proliferation of consumer technology on campuses has created new challenges for IT departments. Will the pendulum swing back toward centralized IT, or is consumerization knocking down the old ways forever?**

By Jennifer Demski

# THE CONSUMERIZATION OF I.T. PENDULUM OR WRECKING BALL?

## SMARTPHONES, AFFORDABLE SOFTWARE, CLOUD COMPUTING, CROWDSOURCING, SOCIAL MEDIA....

The burgeoning consumer-tech market is creating new challenges for higher education IT departments. As increased expectations of mobility and connectivity have students and faculty looking to consumer technology to meet their academic needs, IT must revamp operations and infrastructure to meet the demand, while keeping security risks and budgets in check. Is the new consumer IT model here to stay?

While some IT administrators hope that the pendulum will eventually swing back to centralized, institutionally controlled IT, experts warn that the drive toward consumerization will fundamentally change IT operations for good. *CT* spoke with Sheri Stahler, associate vice president for computer services at **Temple University** (PA); Ronald Danielson, vice provost for information services and CIO at **Santa Clara University** (CA); and Carol Smith, CIO of **DePauw University** (IN), to find out how their institutions are tackling the trend. ▶



**“When people can tap into collective knowledge so easily, that in itself leads to innovation.”** —*Sheri Stahler, Temple University*

**CAMPUS TECHNOLOGY:** Do you see the consumerization of IT as something that needs to be contained and controlled, or as an inevitable evolution of the campus computing environment?

**RONALD DANIELSON:** We’re far beyond the point where use of personally owned devices can be controlled. At SCU, we do try to contain it somewhat. For example, we require that staff accessing administrative systems from home do so from a university-owned computer, to minimize the chances of another user of that computer introducing malware.

**CAROL SMITH:** I see this as an evolution that we should embrace and that will provide many benefits, but how we take advantage of it will vary across the different areas of IT. Redirecting some of our focus to virtualized applications that students can run directly from their laptops, for example, has the potential to reduce the number of physical computer labs that we must maintain across campus. Understanding students’ expectations about how they manage their schedules online, access their files and coursework, pay bills, or check their grades will shape the functionality that we build into our

student information systems. By recognizing students’ needs and finding the most efficient ways to enable them to complete these types of “administrative” activities using their personal mobile devices, we can help give them more time to focus on their academic lives—which is the core reason why they are on our campuses in the first place.

**SHERI STAHLER:** There are definitely concerns regarding security, but this trend is going to lead to a lot of innovation. The knowledge is out there, and when people can tap into collective knowledge so easily, that in itself leads to innovation. I’ve already seen a tremendous amount of creativity in how faculty and students use consumer tools to support their academic work. Plus, when you embrace this trend, you also eliminate silos, both between IT and the academic departments, and among the academic departments themselves. When you are crowdsourcing and researching applications that have been used successfully in one discipline to see how they could be used in yours, those silos break down.

## VIRTUAL CONSUMERS

**TALK TO AN I.T. ADMINISTRATOR LONG ENOUGH** and the conversation is sure to touch on virtualization and the cloud. And it’s no coincidence that virtualization in higher ed has grown apace with the consumerization of campus IT.

“The two trends absolutely go hand in hand,” remarks Sheri Stahler, associate vice president for computer services at **Temple University** (PA). “With virtualization, our users who rely on mobile devices or personal tablets or laptops become truly untethered. They can choose the device that works best for them, and access whatever they need, whenever they need it, as long as they meet the security requirements for the network.”

In the consumerized IT environment, virtualization allows campus IT to be more effective in supporting the student academic experience. By establishing a virtual computer lab that students can access from their personal devices, for example, IT can reduce the number of physical computer labs it needs to maintain—and redirect that money and energy toward other projects.

“If students access the virtual computer lab on their own devices,” explains Carol Smith, CIO of **DePauw University** (IN), “we can refocus our funding and staff time on things like managing the specialized applications that students need for their coursework and ensuring that they always have access to solid, reliable tools—tools that they don’t need to learn how to manage themselves.”

In fact, virtualization has the potential to level the playing field in the consumerized tech environment. “By creating a virtual desktop that students can access on their personal devices,” says Ron Danielson, vice provost for information services and CIO at **Santa Clara University** (CA), “we can expose students to software that they might not otherwise be able to afford, and provide capabilities that students and faculty need but their consumer devices either don’t offer or offer poorly.”

Extending virtualization to include internal cloud services creates a secure infrastructure for researchers, students, and faculty looking to utilize consumer web 2.0 tools and web-based applications. Temple University set up its internal cloud to provide a variety of configurations to end users, depending on their needs, reports Stahler.

“Our users can be a member of a greater server where they have access to a number of applications, like the Microsoft Office apps,” she explains, “or, if a researcher relies on his own software but needs a way to host a WordPress site internally, we can provide an infrastructure that assures him that his site is secure and backed up. Researchers are very protective of their data, and the internal cloud allows them to use consumer technology in a secure way.”

**CT:** How do you ensure the security of your campus network in a tech environment where users rely on personal devices, social networking software, apps, and other possibly vulnerable consumer IT products?

**DANIELSON:** IT professionals understand we can’t “ensure” the security of our networks. We can only try to make the occurrence of a security problem less likely. We’re at a juncture between keeping our current (relatively restrictive) security policies and making a large part of our client population very unhappy. And I think we’re going to resolve this by accepting the risk of somewhat less security to make it easier for clients to use newer technologies that help them learn and do scholarship more effectively. We’ve started talking to our risk management people about what we’re willing to let go and what we absolutely have to retain.



**STAHLER:** But policies, really, are a big component of network security now. We're constantly making sure our policies are up-to-date. Sometimes they're reactive rather than proactive, but when it comes to the use of consumer devices on the campus network, you have to have

and student dorm rooms; a secure LAN for shared network storage with encrypted VPN for off-campus access. We also provide antivirus software to all students for their personal laptops. Finally, we work hard to educate our campus clients about healthy and safe computing habits,

because of this new computing environment, but the details and the day-to-day certainly have and continue to evolve. The IT department has to be able to balance solidity with flexibility to be most successful.

At the same time, while the core role

**“It’s clear that the wireless network needs to be much more robust and able to handle many more clients pushing increasing volumes of data.”** —*Ronald Danielson, Santa Clara University*

policies in place. What university information can users store locally? Or what happens if a device is stolen—can you wipe out the device’s hard drive? What happens if personal information or sensitive data is leaked?

**SMITH:** We have a number of measures in place: secure-password policies; a data-encrypted, web-enabled administrative system; secure campus wireless; wired network to all campus offices, classrooms,

perhaps most notably through our participation in National Cyber Security Awareness Month each October.

**CT: What is the role of central IT in this new computing environment?**

**SMITH:** The role of the central IT department is to provide a sound, stable working environment that aligns with the mission of the institution. I’m not sure that our role has really changed

may not have changed, some of the guiding principles that shape decision-making definitely have. In particular, the IT department has shifted from being the central entity on campus that provides and manages (i.e., “controls”) all things IT, to one whose most powerful function is to act as a connector and an enabler.

**STAHLER:** The key is recognizing this trend and making sure guidelines are put in place for social media use, for personal data, and for any factor that could compromise university assets. Protecting data has to be a university-wide priority.

The walls around our department have become much more permeable. Rather than putting blinders on and pretending that departments aren’t setting up their own web servers, creating their own learning management systems, or relying on social networking and mobile apps, we need to know what’s going on so we can figure out how best to support it.

At Temple, for example, every department and every researcher felt they needed their own server in front of them. In reality, those servers weren’t backed up regularly and they weren’t secure. In response, we created an internal cloud, so now there’s a better option that’s backed up regularly and undergoes routine random security checks.

We specifically provided a number of cloud computing arrangements to match a wide variety of needs. We were able to provide the end users with a solution that would pay off for them in the long run.

## FOCUSING ON THE CORE

**HOW DOES THE TREND** toward consumerization affect IT strategic planning on campus? Carol Smith, CIO of **DePauw University** (IN), responds:

“We organize our work in the IT department around three main areas: maintaining the infrastructure, or what I call ‘the stuff’ (the network, devices, the ERP, desktop tools, etc.); supporting campus work flow such as learning, living, teaching, and administrative business processes (what people do with ‘the stuff’); and creating points of connection between people and information. Using these broad organizers enables us to keep our focus on the core of what matters, while providing the flexibility to adapt to the changing landscape over time.

“Another thing to consider is the notion of ‘core’ versus ‘critical’ in deciding how to make IT investments. A critical system or service is one that the institution absolutely needs to have. If something doesn’t make the ‘critical’ cut, then we probably don’t even need to offer it and we set it aside. Once we know if something is critical, we determine whether it is core: If it is something that is unique or culturally specific to our institution—that only we can maintain—then it is core.

“This classification helps us decide how best to provide services. If a system or service is core, then we know that we need to maintain it. But if it is merely critical, then we should consider outsourced or cloud solutions, if they exist and are economically feasible.

“As an example, when evaluating new e-mail systems three years ago, we determined that, while having an institutionally branded e-mail account for each student was critical, hosting our own on-site system was not core. This shaped our decision to transition to Google Apps for Education. I could see this same method being useful in determining how or when to embrace particular ‘consumeristic’ IT elements that our clients bring to campus.”



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## THE CONSUMERIZATION GAP

**DO YOU KNOW HOW MANY** of your university's employees are using their personal smartphones for work purposes? In a 2011 IDC survey (sponsored by Unisys) of more than 3,000 workers and IT administrators in nine countries, only 34 percent of IT administrators reported that their organization's employees use personal smartphones to conduct business activities. In contrast, 63 percent of employee respondents reported using their personal smartphones for business purposes.

Similarly, while 13 percent of employee respondents reported using a tablet device for work, only 6 percent of IT respondents were aware of the tablet use.

In addition to highlighting the lack of awareness, the survey found a lag in technology adoption among IT organizations. When asked to rate their adoption and use of social networking applications and consumer devices for business purposes, 48 percent of responding IT workers considered their organizations to be "late adopters," while more than 60 percent of employee respondents considered themselves average-to-early adopters.

What's holding IT back? Among IT workers surveyed, the greatest barrier to enabling employees to use their own PCs and devices at work was security concerns, followed by the risk of viruses from social networks and challenges in developing corporate policies to support consumerization.

It's really about making the users better choosers.

**DANIELSON:** I agree. IT needs to be aware of what devices students, faculty, and staff are using on campus, what they're using them for, and what apps and services they're using. Then we need to get our staff using some subset of those devices so we know what benefits and concerns we're dealing with. There's not a lot of time after something gets introduced for us to do that (we had the first iPad network connection failure the morning it was introduced), so we have to be pretty agile.

**CT:** What effect does the consumerization of IT have on the tech budget?

**SMITH:** While it's doubtful that the consumerization trend will reduce overall expenses, it will definitely shift how we spend our budgets over time. In the future, for example, we will likely spend less on computer lab hardware and refocus those investments in areas such as virtualization, security, and even off-site cloud services. One key shift that we have already made is our transition from managing an on-site e-mail system to using Google Apps for Education [GAE]. As we were evaluating new e-mail systems, a big factor in our decision to adopt GAE was the fact that a large

percentage of our students and faculty members were already familiar with Google e-mail through their own personal accounts.

**DANIELSON:** On our campus it's too soon to be able to say what the financial impact will be. There's the age-old hope that when everyone has mobile devices we won't need computer labs, but I currently see students sitting in our labs using our computers with their laptop open on the desk beside them, so I'm not counting on that.

I think it is clear that the wireless network now becomes much more important, and needs to be much more robust and able to handle many more clients pushing increasing volumes of data, and I suspect that will lead to a decline in the number of wired ports on campus over time. We put one wired port per two seats in the library that we opened over three years ago, and I wouldn't put any in at client seating if we were doing it today. Also, many of the services that people are accessing with these consumer devices are off campus, so the need for commodity internet capacity will go up faster than it otherwise would have.

**CT:** What is your best piece of advice for campus tech administrators who are facing this challenge?

**STAHLER:** I was speaking at a conference on this topic recently, and I asked the audience—all higher ed IT people—how many of them think consumerization is just the pendulum swinging, as it does every couple of years, away from centralized IT, and that it will swing back toward centralized IT again. The majority of the people raised their hands. Wow...if you think that, you're going to be scrambling to catch up. I don't think we'll ever return to centralized IT. The network is going to be secure and centralized, but the devices? No. This "pendulum" is a wrecking ball. We need to adapt to it.

**SMITH:** And we need to listen. As campus technology administrators, we must balance what's important to keep the infrastructure reliable and secure with how much we let people do in order to accomplish their goals. To do that best, we must listen carefully to our constituents—in ways ranging from formal assessment to engagement with campus committees and informal dialogue with individuals across campus—so we can best gauge their needs. Then we can connect what we know about our own faculty and students with information from our external peers/colleagues and other larger studies in the field, to help us to understand where to focus resources.

**DANIELSON:** Study Zen. Consumerization is here now and will only increase in the future. There'll be some rough experiences, but we'll figure out a balance that's acceptable to everyone involved, and then we can move to the next crisis. **CT**

*Jennifer Demski is a freelance writer based in Brooklyn, NY.*



### ONLINE EXCLUSIVE:

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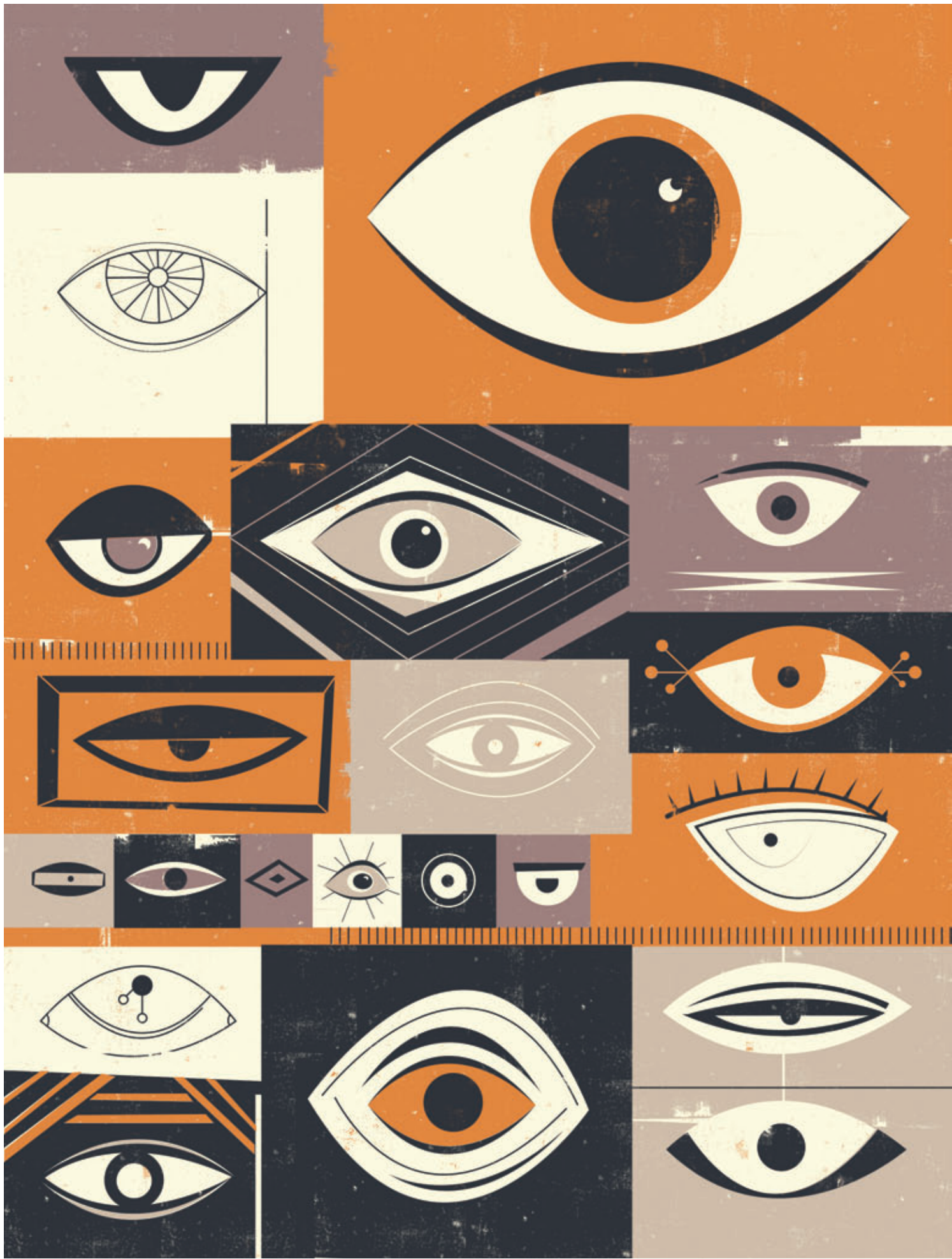


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# all eyes turn to

## **Video Surveillance:**

**With analog systems difficult to scale and maintain, many institutions want to transition to IP-based video security systems. Can it be done affordably?**

**By David Rath**



**S**ometimes you just know when enough is enough. Paul Perrone remembers a meeting in the fall of 2008 as one of those moments. He had just joined the **University of Rhode Island's** Department of Public Safety as senior information technologist. A vendor was trying to convince him to upgrade the five digital video recorders (DVRs) linking the school's 70 analog surveillance cameras. "I didn't have a good gut feeling," he recalls. "I was not going to make a new investment in a system that wasn't scalable. I had to factor growth into the equation."

Thus began several months of research on enhancing the school's video management system on a limited budget. ▶

## KEY ISSUES FOR IP TRANSITION

**ANY INSTITUTION CONSIDERING A TRANSITION** to IP-based video surveillance must pay close attention to issues surrounding bandwidth and data storage.

**1) BANDWIDTH.** Although bandwidth is more plentiful these days, streaming live video images from hundreds of IP cameras across campus to a central location will no doubt put considerable pressure on a data network. While many universities have hefty network backbones, those with smaller data pipes must pay close attention to how they configure an IP-based surveillance system.

Most campuses choose to stream video to a network video recorder (NVR) located in each building, with access to that recorder managed from a central hub, says John Honovich, the founder of IP Video Market Info. To avoid overloading the wide area network, the NVR forwards the streams only when a user wants to view video from a particular site. The local recorders can reduce the frame rate of the live video stream or reduce the video quality to ensure that the system does not overload the network.

Paying attention to bit rates can also lessen the impact on the network. A constant bit rate can stream video at a fixed low level such as 2 megabits per second. This mode is preferable where bandwidth is limited, because the constant rate can be predefined, but image quality will vary with the amount of motion in a scene. Variable bit rate systems stream at a low rate when there is not much activity, "but when there are lots of people moving around, it bumps up to around 12 megabits per second," explains Honovich. "You have to make sure you have the capacity to handle the spike so it doesn't crash your network."

When evaluating IP cameras, you also need to consider resolution and file compression. The human eye normally sees motion at 22 frames per second (fps). Camera resolutions range from 4 or 5 fps all the way up to 30 fps, requiring much more bandwidth. "Camera manufacturers can promote their products as above 30 fps," says Ron Walczak, principal consultant with Walczak Technology Consultants in Prospect, PA. "That's nice, but I don't need it. Think of all these megapixel cameras, transmitting at megabits-per-second rates. With dozens of them on a network, that could bring your network down."

Even if you don't opt for the clarity of megapixel cameras, you still should take steps to reduce the network load created by an IP-based video system. The key is compression. "By using H.264 compression, it reduces bandwidth needs by up to a factor of 10," says Walczak of the newest video-compression technology. "It really helps."

**2) DATA STORAGE.** Most university campuses tend to retain their video images for a month or more, which can require dozens of terabytes of storage. Organizations typically store video data on dedicated storage-area networks (SANs). These server-based systems offer flexibility because you can keep adding storage as you need it. The **University of Rhode Island**, which retains images for 30 days, uses a dedicated 8.25-terabyte HP StorageWorks 1500cs Modular Smart Array. (Storage is becoming less worrisome as it gets cheaper: You can find a 2-terabyte hard drive for \$250.)

There are some promising new developments in storage, such as "edge recording," where the recording is stored in the camera itself and the data is transmitted only during alerts or when an official wants to review a specific incident. This has appeal for schools with bandwidth concerns because the recording is independent of other network conditions, such as congestion and downtime.

But edge storage does cost more than centralized storage, and most video management systems don't support edge devices yet. As a result, you either have to use the camera's web interface or pull a card from the camera to retrieve the video. "So far, edge storage is really rare, like 0.1 percent of the market," says Honovich. Another downside is that edge devices require more individual maintenance and the camera itself can be stolen.

Another possibility is cloud storage. Honovich dismisses it as a viable alternative right now, although this is likely to change in the future. At the moment, for both cost considerations and ease of management, an NVR and local storage are a better bet. Bandwidth is a limiting factor of any cloud solution, too, especially in this era of megapixel cameras. And then there are security concerns, since images captured on cameras may ultimately have to be used in court proceedings.

"You may hear about an example or two," says Honovich of schools implementing a cloud solution, "but no one is doing it in reality."

Like Perrone, many university officials recognize the need to upgrade their older analog systems. In a 2010 survey by *Campus Safety* magazine, half of university respondents expressed dissatisfaction with the quality and coverage of their current video surveillance systems. Among the limitations of analog CCTV systems are the cost of installing cable to support and power them, especially on a large campus; the difficulty of scaling up; the lack of interoperability with other security systems; and the inability to provide access to authorized users in the field.

Given all that, it's no surprise that colleges and universities want to modernize their systems. Indeed, despite the woeful economic situation, many institutions expect their investment in video surveillance to increase slowly over the next five years, even as funding for other security technologies remains flat. "It's because there is a clear return on investment," explains Tonya Fowler, director of competitive benchmarking services for Frost & Sullivan, which conducted a 2010 survey on video surveillance systems in US educational facilities. According to Fowler, most respondents to the survey believe that their investment in video surveillance will be more than offset by savings in manpower and security officers on the beat.

Now may be a good time to plan your campus's transition. Internet protocol (IP) network-based cameras and digital video management software are maturing. In a nutshell, prices are going down and the number of features is going up. "Three years ago people might have still looked at analog systems, but that is not an option anymore," says Robert Grossman, an electronic security consultant based in Egg Harbor Township, NJ. "Everything is IP now."

But if putting cameras on your IP network makes sense now, many decisions still need to be made based on your campus's needs, including choices about network configuration, camera types, storage hardware, and video

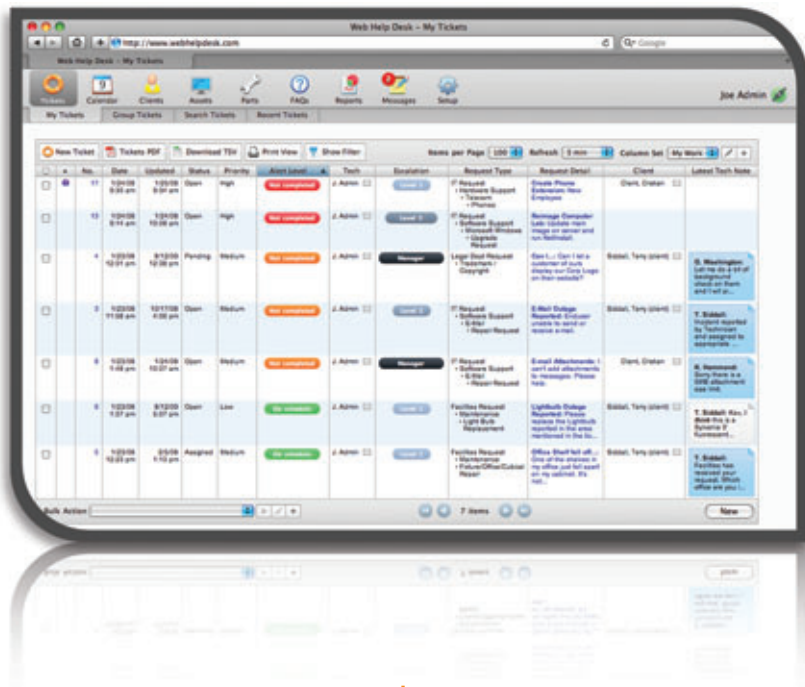




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For example, some universities already have multiple analog systems in different parts of campus, and proprietary systems that can't talk to each other. Fortunately, these institutions don't have to throw the old systems out to implement an IP-based solution. Increasingly, one video management system can work with many different types of cameras, both analog and IP.

Analog cameras can be incorporated into an IP network using encoders. The data is digitized and can be viewed alongside IP camera images. While you don't get the high resolution of IP cameras, the analog cameras should work fine in the new video management system. And additional cameras can easily be added to an IP network using Power over Ethernet (PoE)—the camera draws electricity through its Ethernet connection, eliminating the need for power outlets.

The initial price tag may be higher

for IP-based systems than their analog counterparts, but IP systems can end up having a lower total cost of ownership when you consider scalability, better image quality, longer life span, and lower maintenance costs.

"One classic mistake is to look at the cost of an analog camera at \$300 and an IP camera at \$450 and say you can't afford the IP camera," says Fredrik Nilsson, general manager of Axis Communications, a vendor of video surveillance systems. "You have to look at the total cost of ownership. The larger the system gets, the more savings you will get out of IP."

### Consultants and Integrators

When upgrading from analog to IP, you must first decide whether to tackle the project in-house or outsource it. URI's



#### ONLINE EXCLUSIVE:

The University of Rhode Island is committed to transitioning from its current analog system to an IP-based surveillance system. In an online exclusive, read the full story of how URI is planning for the upgrade with the help of a third-party integrator.

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Perrone decided to turn to system integrator Galaxy Integrated Technologies to install Verint Systems' Nextiva IP video management software, along with Nextiva eight-channel encoders—all leveraging the university's existing infrastructure.

"In my mind, if we could work with a single vendor that knows the products and has installed them successfully elsewhere, I could feel good about it," Perrone says. "Galaxy had many major accounts."

Consultants and integrators are basically an engineering department for hire, says consultant Grossman. "You hire us because you don't have the expertise in-house or you don't have the time. If you are going to investigate this yourself, it can be a time sinkhole."

Not all consultants are created equal, though, and it pays to do due diligence before signing on the dotted line. Some system integrators are closely linked to certain manufacturers, for example, while some consultants too often take the safest route. "If a consultant is saying go with the same big vendor 80 percent of the time, it raises some red flags," says John Honovich, the founder of IP Video Market Info, a video surveillance information portal. He suggests looking for diversity and how creative a consultant is at crafting solutions.

Whether you implement the IP solution yourself or hire an outside party, be sure you understand how open or proprietary the video management system and equipment are. Understandably, many universities are shying away from becoming locked in with one manufacturer. In response, many vendors are now working to adopt open standards to allow their equipment to work together.

## TRENDS TO WATCH

**1) ANALYTICS.** Many vendors tout their products' video-analytics capability. The newest generation of "smart" IP cameras can be set to send video clips to campus police only when their onboard software detects suspicious behavior, offering potential bandwidth savings.

Some cameras have motion detectors that automatically increase the frame rate when they detect movement. Others have tamper alarms to detect if someone spray-paints or sticks gum on a camera, for example. Yet the analysts interviewed for this article agree that the technology isn't quite ready for prime time. Some systems send too many false alarms and users ultimately turn the features off. "I have a PC with a webcam and video analytics that is supposed to recognize me so I don't have to enter a password all the time," says Robert Grossman, an electronic security consultant. "It works one in 10 times. By and large, people say they will come back to analytics in a few years."

**2) MEGAPIXEL CAMERAS.** While not new to the market, megapixel cameras still garner a lot of attention. They provide much higher resolution than traditional surveillance cameras, making them helpful in situations that require detailed images for identification purposes. They may have some performance issues in difficult lighting situations, however, and they also require careful balancing of network configuration, bandwidth, compression, and frame rates. Megapixel cameras are becoming less expensive every year, costing only \$50 to \$100 more than other cameras. And some models require considerably less bandwidth and storage than earlier versions.

**3) LICENSING FEES.** Traditionally, analog CCTV system vendors didn't charge an ongoing maintenance fee because they were just selling cameras and a DVR. Now that video surveillance is more of a software solution, most video management system vendors charge about \$300 per camera for a one-time licensing fee. And some now also charge an annual maintenance fee. Think twice before shelling out for this. "There are so many credible players that don't charge," says Honovich, "that even the ones that do are willing to negotiate about it. It is a good question to ask up front."



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## VENDOR ROUNDUP

For links to the vendors and products mentioned here, go to [campustechnology.com/1011\\_surveillance](http://campustechnology.com/1011_surveillance).

### AVIGILON

Avigilon sells an HD surveillance system, including control-center software and a wide range of megapixel cameras. The system can capture audio and video, and integrates with existing analog systems.

### AXIS COMMUNICATIONS

Axis provides its Camera Station video management software (VMS) to complement its range of network cameras. Video encoders allow integration with analog systems, and a Windows-based client permits remote viewing.

### GENETEC

Genetec's Omnicast IP surveillance system is open platform, allowing users to connect analog and IP cameras from different vendors, scale as needed, and optimize bandwidth use. The system allows remote access, and video can be shared with police.

### GVI SECURITY

GVI Security is geared toward small to midsize entities requiring simple IP video surveillance solutions. Its product line includes AutoIP (open-platform VMS) and a series of network video recorders, megapixel cameras, and video encoders.

### INFINOVA

Infinova touts its ability to integrate IP and analog systems, extending the life of existing equipment. It offers a range of megapixel and IP cameras, and its V2216 network VMS is a central management platform for network video systems of all sizes.

### LENSEC

Lensec's Perspective VMS works with both IP and analog cameras, can share video images with authorities, and offers remote viewing with no client-side software installation. Its camera viewer provides virtual pan-tilt-zoom on any network camera.

### MILESTONE SYSTEMS

Milestone's XProtect open platform supports IP cameras, encoders, and nonproprietary DVRs and NVRs from more than 80 different manufacturers. A remote client feature offers live view and playback from up to 16 cameras.

### PANASONIC SYSTEM NETWORKS

Panasonic markets a full range of IP video solutions, including megapixel and vandal-proof cameras. Its WV-ASM970 system management software is compatible with analog and IP network cameras.

### VERINT SYSTEMS

The Nextiva IP video management solution can support hybrid analog/IP configurations, and optimizes bandwidth use through compression and dual streaming capabilities. Verint also sells integrated analytics, IP cameras, encoders, and intelligent DVRs.

### VIDEO INSIGHT

Video Insight offers a full suite of open-architecture IP video surveillance software, with a focus on school districts and higher ed. The software supports both analog and IP cameras, and provides map- and floor plan-based navigation.

## Must-Have Features

If scalability is a must for universities looking to upgrade their video surveillance system, legacy issues are often the make-or-break aspect of any move to an IP system. And for many colleges, this means ensuring that the new IP system can be integrated with their existing access-control system, which controls entry to buildings such as dorms and labs.

"For more than half the university customers, this will dictate product choices," says Honovich, who says that access-control systems are so hard to replace that no one attempts it unless forced to. "When you see RFPs for new video systems," he says, "they will almost always state which access-control system they have in place and that the video system must integrate with it."

Equally important for many schools is ease of use—the user interface must be straightforward enough for campus safety officials to grasp quickly. This was certainly a high priority at URI.

"With the previous system, you needed IT skills to search the video and do the archiving," explains Perrone. "The Verint video management system has a much friendlier user interface. The officers can easily search through it themselves."

Ease of use should not be mistaken for simplicity, however. Today's surveillance products are far more sophisticated than earlier iterations. With many systems, for example, safety officials can now access the network from a home computer or a smartphone, or allow access to system cameras from outside the network. Police officers can be given login credentials to view cameras from a laptop or smartphone before entering a building in response to an incident. And the ability to monitor and record sound can provide campus police with a more complete picture of an incident and help identify suspects.

In deploying any complicated new system, say consultants, the key is to avoid throwing users in at the deep end. "You may want to start with the basic package and a smaller feature set until your staff is up to speed—and then move up," advises Grossman. **CT**

*David Raths is a freelance writer based in Philadelphia.*

## Portals in the Cloud Enhance Communication and Collaboration

**A**n organized portal is the best way to offer students, faculty, and staff personalized entrance to a university's resources. But several years ago, Boston-based Suffolk University realized users were having trouble finding the school's two portal sites, not to mention the content stored there. "Our portals were a well-kept secret," says Director of Web Services Geert Kinthaert. "We had to fix that."

With more than 9,500 full- and part-time students, Suffolk University is a private university located in the heart of Boston, with an additional campus in Spain. The school focuses on arts and sciences degrees, along with its business and law schools.

Suffolk's two portals—one for the law school and one for the arts, sciences, and business programs—were originally deployed in 2003. They run on software from CampusCruiser, which offers portal management software, a learning management system, and alerting technology, all available via an annual subscription fee. Because all CampusCruiser products are delivered from the cloud via the software-as-a-service model Suffolk avoided buying, installing, and maintaining portal software or hardware itself.

When the university decided in 2009 to redesign its portals, surveys of users revealed that those who did manage to find the portals often had trouble navigating to the content they wanted. That wasn't all. "There were some common things people wanted [from the portals], like calendars, customization, and personalization," Kinthaert recalls.

As part of the redesign process, the school considered other solutions, including

Blackboard (its current LMS) and Datatel, whose student information system they use. This process revealed that the portal problem weren't caused by the tools Suffolk used, but rather, by how they were being deployed—or not. "The [organizational] issues we were dealing with weren't technology-related," Kinthaert relates. "They had more to do with content and usage."

With this information, Suffolk set about to drastically redesign its arts and sciences/business school portal using CampusCruiser PORTAL. The goal was to improve content organization and navigation capabilities. IT staff retagged content that belonged on the portal created new content where information was missing, and reworked the layout and navigation into logical groupings of information.

Style sheets helped with the redesign. Updating the user interface was "easily done in [CampusCruiser PORTAL's] Design Manager by working with the style sheets that are available," Kinthaert says. That helped group information under tabs across the top, such as Classes & Registration, Academics, and MyFinances

Another result of the redesign was improved integration with the Datatel student information system. Students can now perform virtually any online transaction through the portal, which uses Datatel WebAdvisor self-service screens. The integration with Datatel was part of the CampusCruiser software, Kinthaert points out. "We didn't have to lift a finger," he says. "It came as a package."

The revamped portal integrated well with the school's RedDot (now Open Text) content management system. With some 400 content managers on campus already using that product, Kinthaert wanted to make sure

that users didn't have to learn a new toolset.

The new portal also employs CampusCruiser's alerting technology, CampusCruiser ALERT. "We often use the system headlines and announcements to alert the campus community to all sorts of events," Kinthaert says, including inclement weather, school closings, and system availability. To collect student contact information, Suffolk uses CampusCruiser's eCheckin module. Students must initially complete a form, and acknowledge having read the student handbook before they can access the portal. Since the system is integrated with Datatel, the record is saved in the student database. "It's a cool tool," Kinthaert says. "It's helped us gather emergency contact information for our campus."

Kinthaert estimates that with CampusCruiser's cloud solution, the university is saving money on infrastructure as well as resources—since CampusCruiser assumes all responsibility for maintaining the software. Suffolk does not need to assign any of the required staff resources typically found with on premise solutions, such as database administrators, network administrators, or analysts. "The administration is really easy for us," he says. "We have one portal administrator per portal. It's fairly straightforward; even I can figure it out."

With its first redesigned portal in place and plans underway to redesign the second, students, faculty, and staff at Suffolk are now easily finding the information they want, when they want it.

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# Trendspotter

## Students Take Charge of Their Learning

IT-enabled choice and flexibility will transform education. By Mary Grush

CT asked John Ittelson, director of communication, collaboration, and outreach for the California Virtual Campus (CVC) and a professor emeritus at California State University, Monterey Bay, about the rising consumerism in higher education and its potential effects on traditional education institutions.

**CAMPUS TECHNOLOGY:** Are students in California becoming more selective consumers of education?

**JOHN ITTELSON:** Economic realities have changed the way students look at how they spend their education dollars. Reduced state budgets have resulted in increased tuition, limiting access for many to classes at state education institutions. Students must now consider all opportunities available to them to meet their education goals—they need to become savvy consumers. They are looking carefully at community colleges, the California State University schools, the University of California schools, privates and for-profits, and making choices based on their own perceptions of value and convenience.

**CT:** What are some of the forces influencing this trend toward consumerism?

**Ji:** It's actually a convergence of social, economic, and technology influences, along with the dynamic interactions among these forces. And this is more than a trend. Student preferences and demands will ultimately affect the institution at a very fundamental level, and the potential result is that we'll see some big changes in education in the near future.

**CT:** How are students taking charge of their education choices now?

**Ji:** Many students go to multiple institutions—they are swirling among these schools as they choose. Some may start at one school but then life happens—and they need to change schools. In a sense, such students are taking charge of their education whether they like it or not! Then there are the more proactive students who are bypassing traditional degree programs—they realize they can learn with open source content, and they are looking for ways to validate their learning without going through the hoops, so to speak, of traditional degree programs.

**CT:** What has CVC done to serve changing student needs?

**Ji:** We did some data analysis on what we call the new and emerging student in California. We found a big demographic shift: What we used to call the “nontraditional” student (not enrolled full-time on campus) is now in the majority at community colleges. On the basis of that, we created a new student portal—launched this year at [cvc.edu](http://cvc.edu)—which tries to address what students really want and need to succeed. Part of it is career planning, part is academic advising, and part is removing friction between

the various education institutions that might be offering credits.

**CT:** Which technologies will change our education systems most as we address new student demographics?

**Ji:** Mobility and the cloud will be large in effecting change. Identity and authentication—essentially the process of validating and certifying learning—will be at the forefront of the education process and become central to IT infrastructure. With open education resources, and more online and distance learning, we are moving from technology being a support for the business of teaching and learning to technology *being* the business.

**CT:** Is higher ed ready for change?

**Ji:** We have always had the ability in higher education to resist change. It's hard to argue with institutions that still use the cap and gown

from the Middle Ages at their most important event—graduation! But this is a pivotal point in education: Will our traditional institutions embrace the fundamental changes that have been predicted for a long time, or will other institutions have to meet the needs of today's students as they become more and more ready to take charge of their learning? **CT**



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