



News

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Podcasting 101:

What the Web's New Trend Means to You

Laurianne McLaughlin

First, the phenomenon of blogging changed the rules for online publishing. Now, podcasting has opened the world of online broadcasting to anyone with a PC, a microphone, and a Net connection. Don't be mistaken, podcasting—which gets its name from a combination of broadcasting and the Apple iPod—isn't just for fun and games. You can find plenty of podcasts focused on music, talk-radio style banter, and humor, but podcasts also now serve key purposes for news organizations, businesses, and even politicians trying to connect with voters. Furthermore, they're making news in education, especially in universities with the resources and funding to support early applications.

Besides the "democratization of media" appeal, podcasting offers a good dose of convenience. You subscribe to this radio-like audio via Web feeds to get automatic downloads to your PC or music player, which you can then listen to at your convenience, anywhere from your car to the gym. Many people liken podcasts to "Tivo for radio." While podcasting started as an audio medium, a growing number of podcasts now feature video as well.

This isn't a new media fad that's going away: A July 2006 study from Nielsen NetRatings finds that 6.6 percent of the US adult online population,

or 9.2 million Web users, have recently downloaded an audio podcast. By comparison, 4.8 percent publish blogs and 3.9 percent use online dating services. Podcasting hasn't yet neared the popularity of paying bills online (which draws 51.6 percent) or online job hunting (24.6 percent)—but it's growing

In 2005, *The New Oxford American Dictionary* named "podcast" the word of the year.

quickly for an idea that few people had heard of before 2004.

BIRTH OF A MEDIUM

Software developer Dave Winer—known for developing the RSS (Really Simple Syndication) technology for Web content feeds, which lets people subscribe to Web sites using RSS reader tools—also contributed to the birth of podcasting. Winer worked with former MTV on-air personality Adam Curry and other early bloggers on ways to add audio to blogs. Winer helped run "BloggerCon," a 2003 conference at Harvard Law School's Berkman Center for the Internet and Society, which brought

developers and bloggers together to lay the groundwork for *audioblogging*, the RSS-fueled distribution of audio that would later be dubbed podcasting.

In 2004, it didn't take long for radio stations such as BBC Radio (<http://www.bbc.co.uk/radio/downloadtrial>) and other media outlets to catch onto podcasting's potential for daily news and commentary. By 2005, *The New Oxford American Dictionary* had named "podcast" the word of the year, and presidential candidate John Edwards used podcasts to reach voters.

From the start, podcasts have worked with various music player devices, software, and computers, not just Apple's. But Apple got more involved with the future direction of podcasting in mid-2005 when it revamped its iTunes software to let users subscribe to and organize podcasts, created a podcast directory at the iTunes music store, and promoted its GarageBand and QuickTime Pro products for creating podcasts.

And while Apple is by no means the only device choice available, the iPod's runaway success has helped fuel podcasting's growth path. Apple has sold 42 million iPods and counting, Apple CEO Steve Jobs declared at the 2006 Macworld trade show. Among iPod owners, at least 29 percent have downloaded a podcast, Forrester Research

in brief...

Bringing Haptics to Consumers

Jan Krikke

Haptics, the scientific field that studies the sense of touch, is increasing its range of applications in digital technologies. The field has attracted little attention outside the domain of specialists, and consumer experience with haptics technology primarily relates to vibrating phones and computer game joysticks.

However, the benefits of the technology—adding physicality to the digital domain—are well understood by product designers, digital content creators, and academic researchers. For the past 10 years, they've used high-fidelity, 3D haptics technology for a wide range of applications, ranging from medical simulation to the design of running shoes to automotive modeling. Software and hardware improvements continue to advance the technology, with growing benefits to consumers.

ENTERTAINMENT

At the E3 conference in Los Angeles in May, Novint Technologies introduced the Falcon, a 3D touch interface device designed for computer games. Available in 2007, the Falcon will retail for under US\$100. The device tracks in 3 degrees of freedom (right-left, forward-backward, and up-down), making it significantly more complex than 2 DOF end-effectors such as conventional joysticks.

Meanwhile, mobile devices using improved versions of conventional vibration technology are reaching the market. Earlier this year, Immersion Corporation launched VibeTonz (www.immersion.com/mobility/solutions), a development platform for mobile devices. VibeTonz exerts high-speed control on a phone's ordinary vibrate motor to enhance navigation, ring tones, chat, and games. Developers can use VibeTonz to make each item on a scrolling list click distinctively. Music and ring tones can carry high-fidelity pulses of instruments, and users can program the phones to reverberate like Big Ben's clock tower or the rhythm of ocean waves. In game play, users feel asteroids hit and bounce off their spaceships. Samsung recently launched the first cell phone enhanced with VibeTonz.

USABILITY

An acclaimed paper published earlier this year (www.cim.mcgill.ca/~haptic/pub/JL-ET-AL-CHI-06.pdf) also identifies cell phones and other handheld devices, including portable multimedia players, as a promising market for tactile haptics technology. The paper addresses the conflict between mobile devices' growing functionality and their limited screen and keypad space. As a result, users face ever deeper menu hierarchies to access mobile content.

To solve the problem, researchers at the University of British Columbia and McGill University propose a multi-element tactile display using piezoelectric actuators. They built a prototype of a thumb-sized haptic display

reported in recent research on the topic. Overall, more than 25 percent of online consumers that Forrester surveyed have tried or are interested in podcasts. Today, you'll find podcasts doing everything from giving relationship advice to selling cars.

DO IT YOURSELF

Podcasting sits there for the taking as a broadcasting medium for people wanting to expound on politics, break out new music for friends, or just bemoan

daily life. You'll also find foreign language lessons and other educational material in podcasts. (Also be aware: because of its unregulated nature, you'll hear plenty of words you can't say on television.) Even NASA uses podcasts to get people up to date and interested in what it's doing (<http://science.nasa.gov/podcast.xml>).

To listen to a few podcasts or just see what's popular, try browsing or searching at Yahoo! Podcasts (<http://podcasts.yahoo.com>). Other big directories of

podcasts include Odeo (www.odeo.com), Apple's iTunes store (www.apple.com/itunes/store/podcasts.html), and Podcast Alley (www.podcastalley.com). Or, search for keywords in podcasts at Podscope (www.podscope.com).

Thinking of becoming a podcaster? For the technology savvy, all you'll need is a PC with a Net connection, a headset with a noise-cancelling microphone, and a few pieces of open source software for encoding and sharing podcasts (See Yahoo's plain-

with eight individual actuator tips. The display interface stretches the skin laterally to activate mechanoreceptors. Specific patterns of distributed skin deformation create shapes and textures that can be associated with specific device functions or menu items. The prototype offered proof of concepts, but the report stresses that additional research is needed before we'll see piezoelectric actuators implemented in commercial products.

MEDICINE

Researchers identify medical technology as one of the most promising applications for haptics. Several medical-training tools using haptics interfaces are already on the market. UK Haptics developed a virtual hand with vital veins that lets nurses practice sensitive venopuncture skills on a variety of hands. Using a haptic feedback device from SenseAble Technologies, trainees feel the needle go through the skin and muscle and the scratch of the bone when the needle touches knuckle. The hardware is an off-the-shelf computer with twin 2.8 GHz processors. One processor refreshes the graphics 30 times a second; the other processor controls the end effector. The electrical current driving the end-effector motors is refreshed 1,000 times a second to simulate the high-fidelity "feel."

Medical simulations are also used to train medical personnel on minimally invasive procedures (such as laparoscopy and interventional radiology) and remote surgery using teleoperators. Someday soon, we'll likely see surgeons work from a central workstation and perform operations in different locations while the local nursing staff handles equipment setup and patient preparation.

Mats Lordin, CEO of Reachin Technology and supplier of haptic software used in UK Haptics' virtual hand believes the key for the industry's success is the availability of haptic software and hardware that improve the user's experience. "I am convinced that we'll see wide usage of applications in medtech, design, edutainment/entertainment, CAD/CAM, et cetera, as the hardware and software technology matures and becomes widely available to professionals and consumers alike." He adds, "The benefits of using haptics in applications for improved experience, accuracy, productivity, and efficiency are unquestionable. The challenge is to make the technology—that is, both hardware and software—available at reasonable costs."



Novint's Falcon 3D touch interface.

English tutorial at <http://podcasts.yahoo.com/publish> for basic advice on how to start podcasting.)

Another simple way to dip your toes in the podcasting pool: Try out a "click and publish" service like Hipcast's Audioblog (www.hipcast.com). You'll need a PC and a good headset with a noise-cancelling microphone, and Hipcast's service will do the rest, letting you upload and make your podcasts available as feeds to which others can subscribe (Audioblog starts

at US\$9.95 per month, with a free 7-day trial).

SELL A PRODUCT

While podcasting attracts plenty of people who want to be broadcast stars, it also fills an expanding number of business roles. Media company Web sites, of course, use podcasts to boost Web traffic and user loyalty by providing supplementary material—such as interviews, tours, and other items that are more valuable when spoken than

read, and which people crave in portable form.

Also, using podcasts to market products and services to consumers and business customers has become a big business in itself. And we're not just talking about technology product marketing.

For the rollout of its new 2006 Corvette Z06, General Motors used a podcast interview with the chief engineer to sell the car and stimulate "viral" marketing online. Pharmaceutical makers use podcasts to market to time-

pressed doctors. Realtors use podcasts to give potential home buyers information like first-hand comments on listings, news about the local market, tips on items such as home inspections, and the like. Even the world's most famous mouse, Mickey, has gone MP3—to help promote Disneyland (www.disneyland.com/podcast)

UNIVERSITIES BREAK NEW GROUND

For the scientific and computing communities, podcasting will help not only with marketing efforts but also with enhancing university and professional education.

“I like to connect students to the real world,” says W. Randolph Franklin, associate professor at Rensselaer Polytechnic Institute’s Electrical, Computer, and Systems Engineering Department. He notes that he likes to teach using visual examples from real projects, such as NASA missions. “What I’d welcome is podcasts from others that I could use with my classes. This would improve the quality of teaching.” Professors could someday pool effort by sharing video-laden podcasts to help students grasp complicated concepts or capture imaginations, he says.

Today’s college students simply expect technology that backs up their research and educational needs. And these students are among the heaviest users of podcasts. Nielsen NetRatings’ June 2006 study found that Web users between the ages 18 and 24 are nearly twice as likely as the average Web user to download audio podcasts, followed by users in the 25 to 34 and 35 to 44 age groups.

At universities including Purdue, Stanford, and Duke, administrators have established systems that simplify sharing podcasts with students and the public. And thankfully for Franklin and his peers, creating podcasts continues to get easier. Podcasting offers a convenient way for schools and universities to deliver both review and supplementary materials to students. Will it

also spur innovation in teaching methods? Some pioneers say yes.

On campus

Purdue University, one of the earliest providers of podcasts to students, launched its “Boilercast” (<http://boilercast.itap.purdue.edu:1013/Boilercast>) system in 2005. Boilercast delivered audio from 130 classes in the 2005 to 2006 school year, with more than 250,000 MP3 files downloaded, and a greater number listened to directly via streaming.

There’s nothing that different about listening to a lecture via a podcast. The challenge for us is to enhance it with another set of resources.

Today, Purdue uses home-grown technology tools. But Purdue will soon move to Apple’s iTunes University program (which offers colleges a prebuilt system for sharing podcasts) to make subscriptions simpler for students, says Bart Collins, director of digital content for information technology at Purdue.

At Purdue, individual professors decide whether to make podcast content publicly available, restricted to university students and staff, or limited to a particular class. Most choose the public route, Collins says. “Podcasting really is about open content,” he says. Purdue also offers “Books and Coffee” podcasts to the public, where professors discuss popular books such as *The DaVinci Code*.

While many professors offer lectures via podcast for review purposes, some, like Purdue biology professor Laurie Iten, are becoming podcasting innovators. For example, she uses podcasts before and after laboratory sessions for first-year biology students, to prepare them for the labs and then to

review principles worked on during the labs.

Still, Collins says, podcasting use at Purdue spikes right before final exams.

The University of Michigan’s School of Dentistry and Stanford University also introduced early university podcasting efforts. Stanford makes a variety of lectures available for public consumption via its iTunes U page (<http://itunes.stanford.edu>)—which has gained popularity with alums in particular.

Duke University is now refining its approach to podcasting. As of fall 2006, Duke delivers Apple iPod devices to students enrolled in select classes that use podcasting to enhance course materials.

Duke had tried a novel, year-long effort in 2004 and 2005 in which it distributed about 1,600 Apple iPods, preloaded with orientation material, to all incoming freshmen, and encouraged professors to explore podcasting’s possibilities. Today, Duke only shares the devices with students whose professors request it—for uses ranging from enhancement of music and theater classes to recordings of lectures. The University’s Center for Instructional Technology coordinates the program.

“We weren’t sure what to expect when we launched this project, but we’ve been pleased by how it’s succeeded in encouraging many faculty and students to consider new ways of using the technology in fields from engineering to foreign languages,” said Peter Lange, the university’s provost and senior academic officer, in a memo about the project’s first-year results.

As students began experimenting with the iPods, they also began using them for gathering field notes, conducting interviews, and as portable hard drives, Lange said.

At many other universities, podcasting arrives via one professor at a time, rather than in a campus-wide effort. For example, at Syracuse University, no formal program for podcasting exists yet, but some professors post video podcasts

on Web pages so students can review lectures.

One North Carolina State University professor, Robert Schrag, found himself at the center of a robust online debate in September, after the popular Slashdot Web site picked up a newspaper article explaining that Schrag had been asked by school administrators to stop selling podcasts of his lectures via a Web site, while the university clarified rules regarding whether professors could sell such podcasts. The MP3 files carried a fee of \$2.50 each. More universities may bump up against questions like this, as podcasting arrives in higher education on an ad hoc basis.

WHAT'S NEXT?

Looking ahead, one big trend in podcasting will be more and more video being incorporated. University professors and organizations providing professional certifications, say in information technology or medicine, will have an increasingly large target audience for instructional video.

But beyond review of lecture materials, even those including video, what is the ultimate potential for podcasting at universities?

"The power is not in the technology but in the type of pedagogy the technology enables," says Christopher Dede, a Harvard University Graduate School of Education professor who researches next-generation learning techniques. "There's nothing that different about listening to a lecture via a podcast. The challenge for us is to enhance it with another set of resources."

For example, he says, using podcasts to enhance students' understanding of a particular historical or natural setting—say offering additional audio material to students walking Boston's "Freedom Trail" of historical sites—is an example of innovative teaching using podcasts. In another example, one of Dede's students developed a podcast for Boston's Museum of Science where people listened to the pod-

cast as they walked through an exhibit, and the podcast prompted them to notice things about the exhibit.

Podcasting won't be the only important new media trend for universities, Dede believes. "We're seeing a number of different technologies that potentially have a lot of educational power," he says. For example, wikis offer huge potential for collaborative writing, Dede says. He also believes collaborative learning through online gaming and social tagging (where people construct their own systems for organizing knowledge) could ultimately prove more important to universities than podcasting.

"The main hurdle is, the kinds of technologies universities tend to adopt are those that don't require changes in pedagogy," Dede says. "If podcasting is considered a note-taking technology (for class review), then it won't have much impact. If it's viewed as an opportunity, it could be an interesting technology."

Purdue is still trying to understand podcasting's learning impact, Collins says. In the context of learning theory, audio is in itself a lean tool, he says. However, "if used appropriately, podcasting might shift the way students work, perhaps encouraging them to interact more with the professor in the class," he says.

Does the university playing field get leveled when students at smaller colleges can tune into podcasts from Purdue? Probably not. As most parents and students learn, a prestigious university education now has as much to do with networking opportunities as it does with classes.

Purdue has also disproved one concern that some critics of university podcasting have voiced, Collins says. Students don't skip class because podcasts are available. "We haven't seen any evidence students are using it as an excuse not to come to class," Collins says. "Well-developed classes provide plenty of incentive to come." ■

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