

A Guide to Multimedia in the Next Millennium

Has multimedia really undergone a transformation? Or does it just have a sleeker facade? Eight industry pundits scratch beneath the surface to find out what's new, what's different, and what lies ahead for multimedia training.

Forget dry, text-only training manuals. They've gone the way of the dinosaurs. Current training is multisensory. It's engaging. It takes risks. Trainees learn by doing, seeing, and hearing. They learn on their own time, wherever and whenever they choose. Multimedia technologies, such as audio and video, are breathing new life into training and creating more opportunities for learning.

But let's get real: Is cutting-edge multimedia training feasible for your small, resource-strained department? And, more importantly, do you really need to bother with all of the technological mumbo-jumbo? The answer to both of those questions is an emphatic yes, especially if you want to make

your career stronger, your training more productive, and your department more valuable.

In our quest to learn about the true state of multimedia for training, we interviewed a diverse group of top-level executives from such well-known companies as CBT Systems, InFocus, Multimedia Learning, Andersen Consulting, Macromedia, ExecuTrain, Gartner Group, and Aimtech. Each expert had a unique perspective, whether from hands-on experience or big-picture knowledge.

The interviews provide valuable insight into what multimedia training means now, what will be possible in the future, and how the changes will affect the training profession.

BY SACHA COHEN



MULTIMEDIA L·e·a·r·n·i·n·g

The Learning Technologies Company

Paul Johnson, CEO
Multimedia Learning
Irving, Texas

Company profile: Multimedia Learning sells off-the-shelf training products, software tools for technology-based course development, and consulting talent to develop custom training programs.

Employees: 185
Net Revenue 1996: \$12.6 million



In the training program, an icon pops up in the corner of the screen and, if you click on the icon, a video of a real teller starts to run. Think how valuable that is for personalized training.

One of the biggest challenges for trainers is keeping ahead of the curve. Technology is being developed in such short cycle times that trainers aren't even close to keeping up.

There is a trend towards new ways of managing and reusing content, accomplished by *chunking*. That means that content is in small granules of information.

Another breakthrough is cross-platform capability. Browser technology has dealt with that limitation very well. Now, corporations with multiple computer platforms can use browsers to deliver training.

How has multimedia changed?

CBT served its purpose and was cost-effective, but it was ugly. Now, we have the tools to do very sophisticated instructional design, such as role play

and simulation. In combination with those, we have nice support tools, such as glossaries, reference guides, and notepads built into the instruction that add value to learning.

What's driving better multimedia?

Companies are in pain from competition and time-to-market pressure. Products are coming to market much faster than before and are more complex. Traditional training methods don't work for these kinds of products. For example, banks are rolling out new products every two to three months. The classroom paradigm is collapsing under the weight [of such pressures].

What are your thoughts on the future?

There will be a major shift from event-based learning to technology-based training. It has to do with combining learning and doing.

You will learn, but you may not *know* that you are learning. It will fundamentally change the way we learn.

What are some emerging multimedia trends?

State-of-the-art multimedia is better than most people think. For example, real-time coaching can be implemented with audio-streaming technology. The first time that I saw the use of coaching in a multimedia course was nearly a year ago at First Union Bank.

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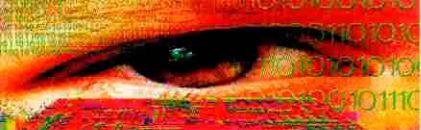
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managing partner, performance
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Dallas



Company profile: Anderson Consulting is a leading global management and technology consulting firm whose mission is to help its clients change to be more successful. The firm works with clients from a wide range of industries to align their people, processes, and technology with their strategy to achieve best business performance.

Employees: NA

Net Revenue 1996: \$4.9 billion worldwide

How is multimedia evolving?

I think that we've seen a significant evolution in the past few years in the quality of tools that have been developed. For example, authorware contin-

ues to improve in terms of sophistication and ease of use. That puts a lot more power in the hands of less-experienced developers, so it's not as daunting to create multimedia programs.

Are there any new learning models?

We believe that training should look and feel like work.

You have to create a multimedia environment that helps people learn, that supports them while they are doing the work, and that allows them to innovate while they're working. For example, one of our clients is a rapidly growing financial services company that needs to bring new MBAs up to speed as quickly as possible so they can make good business decisions. We built a business simulator that models that entire part of the business in software and multimedia. That's a whole new world of learning, much like a flight simulator. It's an open, discovery environment—as opposed to the older world of CBT, which was very linear.

A business simulator mimics the

complexity and degree of interactivity that you would have on the job. In the program, an employee does research, analyzes the business case, and presents business findings to a lending board, which is captured in individual video clips. Based on your level of diligence, you are told to do other things. You can even get "thrown out" of the meeting if you're not prepared.

Trainees' responses to the program have been superb. You should feel like you're at work, not in training. You should get sweaty palms. Gone are the days of training as a safe place in which no one knows what you are doing. You have to give trainees the opportunity to learn by doing. The entire pace of learning is changing. Training and learning have to move at the speed of work. That means smaller chunks of knowledge, and better and tighter design.

Any words of wisdom?

It's very important for people to be broadly literate in the available tech-

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SPEAKING MULTIMEDIA

Here is a sampling from Peter G.W. Keen's *Business Multimedia Explained* (Harvard Business School Press, 1997) that will help demystify some multimedia terms.

Bandwidth. The fundamental measure of the carrying capacity of a telecommunications link. It is often referred to as a "digital pipe." The wider the pipe, the more information can flow through it. Technically, bandwidth is the range of usable frequencies of an electronic signal, but it is more generally discussed in terms of bits per second.

Cache memory. A high-speed hardware memory store that supplements a computer's larger main memory. It acts as an intermediate storage area for such items as data or program instructions that are needed often enough so that moving them constantly from a hard disk slows performance but not used often enough to justify keeping them in the main memory—the system's most limited resource.

CD-ROM. Compact-disc-read-only-memory storage is one of the foundations of multimedia. Available for about a decade, it is only since late 1993 that CD-ROM drives have become a standard feature on PCs. Of all new PCs sold, 70 percent include a CD-ROM drive.

Codec. A coder-decoder that processes nondigital data to convert it to and from digital form, and to compress and uncompress it. Codec is the computer equivalent of a modem. It converts a sound-wave signal, such as the spoken voice, or a more complex video signal, such as that produced by a camera in a videoconferencing room, to digital bit form to transmit it.

Data compression. The technique of reducing the data needed to code information in digital form by analyzing and stripping out redundant elements or summarizing items in a way that lets them be reconstituted later.

Desktop video. The capture, editing, and playback of what we see routinely in the nondigital world of television and film. It is the enabling element of multimedia in two ways: Its cost and quality define the practical limit of widespread application of multimedia tools. And it is by far the most processor-intensive component.

Frame. A single complete display on a screen or video camera. Flicker-free, full-motion video is generated by changing frames at a typical rate of 30 frames per second.

HotJava. An Internet browser that runs applications written in the Java programming language and also accesses the home pages that are the core of the World Wide Web.

nologies. To some extent, corporate trainers and developers are at a disadvantage. They are often asked to write a symphony when they haven't heard music. Learn as much as you can now. Go to the media buffet and snack.

The good news in general is that we're going to see instructional design that is much stronger in its usability and much more focused on understanding users. I think that we can learn something from marketing—for example, testing. Learners know what's best for them, so we need to transfer control to learners.

We operate dynamically, making decisions in real time and reacting to the consequences of those decisions. I think that the trend is for training to reflect that behavior.



Randy Cox, vice president of engineering for the Learning Division
Macromedia
San Francisco

Company profile: A leading provider of cross-platform software tools for digital media creation and publishing.

Employees: About 450 worldwide

Net sales 1997 to date: \$107.4 million

What is the current status of multimedia for training?

Interactive multimedia has proven itself over the last decade to be a critical part of organizations' training efforts. The bulk of interactive multimedia training applications are still currently traditional computer-based training, delivered on CD-ROM, over a LAN, or on dedicated PCs. Over the years, the multimedia training industry has settled on a few standard technologies and time-tested tools, including Macromedia's Authorware, which has been the leader in interactive multimedia authoring for training and learning for almost 10 years.

We believe the advent of intranets and the Internet opens the door to sig-

nificant growth in the use of multimedia for training. Macromedia has been leading the way with the introduction of such technologies as streaming Shockwave for Authorware, which was the first product to allow training applications to be streamed across intranets. Our customers are already delivering hybrid CD-ROM/Internet applications and streaming training applications across the Web. As more companies establish intranets, Web delivery will increase in importance.

What is the value of multimedia to training?

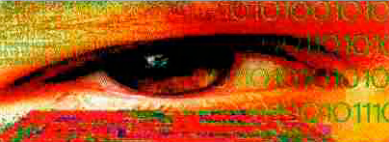
Interactive multimedia has been shown to be significantly more effective in training people than static, text-based, or classroom-based instruction. The key element is the interactivity. Interactivity and simulations improve comprehension and retention of material. Whether delivered on CD-ROM or over an intranet, interactive multimedia training applications can be delivered when employees need the training most and where it's most convenient for them, at their desktops or in their offices.

Authoring tools also allow trainers to incorporate testing mechanisms in their applications. They track a student's progress and offer more challenging material accordingly. Interactive multimedia is cost-effective and safe. Simulation offers the safest training option for new equipment or potentially hazardous processes.

Where is the multimedia industry headed? What new technologies do you see in the future that will help multimedia?

The Web is a very exciting development, allowing for cost-effective, timely, global delivery of interactive multimedia training applications. The Web also represents a treasure chest of interesting content. Trainers can incorporate live Internet links into their applications to provide the most compelling and freshest content available. We're also seeing exciting developments in collaboration technologies, such as shared whiteboards and chat; technologies that enable live, event-oriented training "broadcast" over a network simultaneously to a virtual classroom of distant learners; technologies facilitating instructor-led training in virtual classrooms; and streaming video.

Many new technologies are focus-



ing on compression and delivery of media over the Web, making it easier and faster to deliver content.

Detail some next-wave training projects. How will new technologies change the face of multimedia training?

Some of the most creative things are the types of interactivity developers are incorporating into their training applications. Using Authorware, some developers are borrowing or adapting techniques used by game developers to solicit feedback to track students' progress. This is particularly useful in skills training and testing.

People are also increasingly leveraging their existing CBT assets and delivering them across intranets. We expect an increase in virtual classroom environments, and the incorporation of chat and instructor-led training into Web-based training applications.

What about delivery methods such as the Internet, intranets, CD-ROMs, DVD, satellite, and video? What's the most popular? Which will die?

Along with CD-ROM delivery, LAN-based training is also popular. We expect a surge in Internet-intranet delivery of training, but really don't see the other methods of delivery dying out. IP multicasting is something significant on the horizon.



Jim Buckley, CEO
CBT Systems
Menlo Park, California
Company profile: A leader in the design and development of interactive education software for information technology professionals and business users.

Employees: Approximately 480 worldwide
Net sales 1996: \$86.3 million



"The biggest innovation will be in the area of instructional design. As the demand for Web-based training increases, training suppliers will be forced to redesign their content. New design models will result in the creation of learning objects or mini-tutorials that can be taken either independently or strung together to form an entire course or curriculum. With that flexible architecture, [trainees] can take pre-tests or needs assessments, which automatically present a personalized curriculum using content from a database of learning objects."

—Kevin Kruse, president, Advanced Consulting
Green Brook, New Jersey

How is technology changing the way training is delivered?

Streaming technology lets text, graphics, and audio be delivered over the Internet or a LAN. It is critical to enabling organizations to use CBT training companywide.

We invested in a company called Street Technologies. It offers us decompression and compression technologies. To deliver audio, video, graphics, and so forth, you need the ability to compress very large files and move them rapidly.

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The second movement that I see on the horizon is the emergence of Java as a programming language. Java allows us [and other companies] to develop across platforms. Right now, I think of Java as a giant diesel train just leaving the station. It's strong and powerful, but not going very fast. As we get to the end of the year, it will pick up speed. There is tremendous interest in the information services community to look at, understand, and, in some sense, adopt Java.

InFocus®

Mike Yonker, CEO
InFocus
Wilsonville, Oregon

Company profile: A world leader in powerful, easy-to-use multimedia projection products and presentation services. Founded in 1986 and publicly held.
Employees: 500
Net sales 1996: \$258 million



Will intranets be more important than the Internet to deliver training, or the other way around?

Both will be important. For company-sensitive training, an intranet is the medium of choice. For example, we've developed a Net projector that will become a server on the Internet or an intranet. It will be able to recognize different types of browsers. That will all be possible about 1998.

What new technologies will be visible in a year or two?

Video compression will make it possible to move information much more efficiently. For example, if I try to do a PowerPoint presentation with video, sound, and graphics over the wire today, it takes forever. With compression technology, you can send a 25-megahertz file in a matter of minutes. That means easier, faster, and more seamless movement of video and data over pipelines.

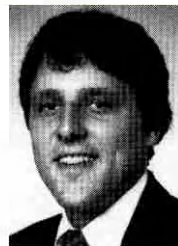
Any advice for trainers?

A lot of people are lulled into thinking that all they need is the technology and their problems will get fixed. That's a recipe for disaster—a very fast disaster. Companies need to fo-

cus on the human side—helping people understand that data and change can be their greatest allies. Most people and companies fall drastically short in focusing on those principles. So, if you're spending \$10 on training, spend \$8 on the people side and \$2 on the technology. Once you get the people side in place, they will readily accept the tools.

GartnerGroup

Steve Bradley, president
Gartner Group Learning
Stamford, Connecticut
Company profile: A leading provider of IT research, advisory, and market research services.
Employees: 2,400 worldwide
Net sales 1996: Not available



How can media be used more effectively for training?

What's exciting for me is the "less is more" theory. By that I mean the effective and appropriate use of media, not just slamming [trainees] with a talking head. The Internet presents a whole new model and whole new way of doing things. But with respect to multimedia, it [also] presents a whole new set of challenges.

The real breakthroughs will be about managing the bandwidth challenge. That's really nothing new, and it won't be old for a long time. There will always be bandwidth challenges. The innovation is finding creative ways to manage bandwidth so you can use multimedia. The interesting thing is *how* to make multimedia more effective. In some ways, it has been overused. The bottom line is that you'll be successful to the extent that you can find out how to use 30 seconds of killer video, instead of four hours of video. Bandwidth limitations, in a way, will force all of us who want to use multimedia to be more judicious.

Do you have advice for trainers?

Yes. Trainers need to focus on skills management—having the right skills in the right place and the time to make people productive, plus using technology to manage skills. Half the battle is knowing what you need and

"CD-ROM is mortal, which means that it's not actively dying now.

With each passing month and year, it will become less the medium of choice; the medium of choice will be the Internet. CD-ROMs will be around for a long time. They are still terrific for delivering "fat media"—audio and video files.

Instructional designers need to learn how to design for self-instruction, whether that's old-style CBT, multimedia CD-ROM, or Web-based training. If it's going to be delivered by computer, it's a different instructional medium. There are different guidelines for computer- or self-instruction, and there are different practices in terms of user interface."

—Brandon Hall, editor and publisher,
Multimedia and Internet Training Newsletter
Sunnyvale, California

MULTIMEDIA TRENDS

Technology alters the way training is conducted and vice versa. In the future, technology and training will be interdependent, with mutable boundaries and unlimited potential. Here are some trends that will shape the future.

The Medium: changes in the way that training will be delivered

- Java programming language
- streaming audio and video
- chunking
- hybrid delivery
- coaching software
- cross-platform capability
- the Internet and intranets
- business simulation technology
- computer-managed instruction
- push technology
- bandwidth improvements
- virtual reality
- data compression
- DVD
- CD-ROM
- MMX computer chip.

The Message: changes in learning and training methods

- technology-based learning
- collaborative learning
- virtual teams
- more learner control
- just-in-time learning
- personalized training
- anytime, anyplace learning
- soft skills training.



"In general, the multimedia industry is headed for greater growth. Multimedia developers are publishers and engineers for a new medium. They integrate all of the independent forms of communication into single, dynamic pieces. In some cases, it's an art. In other cases, entertainment; in still others, business solutions. Growth should continue in different directions—be it consumer or professional, entertainment or business. The factors that will affect growth and the behavior of multimedia will be computing power, speed (particularly on the Internet), level of interactivity, and connectivity—the influence and speed of the Internet."

—Christian Dietrich,
sales, marketing, and account manager,
Muffin-Head Productions, New York

where you need it. That means the ability to assess people, understand what skills they have, and what they need. Then, it's a matter of getting people the right skills on time.

The second part of that is finding creative ways to bring the right training to the right person in the right time frame. That is an issue of balance.

Aimtech

Andy Huffman, CEO
Aimtech
Nashua, New Hampshire
Company profile: Develops and markets software tools used to create business multimedia applications and applets delivered by CD-ROM, networks, and the Internet. The company targets three primary market segments: employee development, electronic commerce, and interactive marketing and customer service.
Employees: 75
Net sales 1996: \$10 million



Are CD-ROMs dying out?

It will probably be quite a while before it gets to that point. There will be CD-ROMs even when [most] people can deliver content on the Web. People will use less "heavy" multimedia so that they can use the Web as the deliv-

ery vehicle. The benefits of delivering on the Web are great enough that people are willing to use less media or lighter-weight media. Some developers will do the hybrid thing, in which the heavy-weight stuff is on CD-ROM.

What are some emerging applications?

One is CMI, computer-managed instruction. That software lets you manage and track [trainee] information from a server. The trend is towards more server-based management of CBT material.

The second application trend is what I call "collaborative learning." In other words, distance learning over the Internet. You'll soon see more and more companies using that technology. The great thing about distance learning collaboration is that it doesn't threaten [instructors]; it assists in the learning process.

An important development for us is Jamba, a visual authoring tool for creating Java applets and applications. It came about as we were realizing that our whole technology needed to support the Net. [Jamba] enables Internet developers, creative professionals, and Webmasters to create interactive, media-rich Java applets without programming or scripting.

ExecuTrain

The Computer Training Leader

Art Hyde, vice president of product development
ExecuTrain Multimedia
Alpharetta, Georgia
Company profile: ExecuTrain is a leader in information technology training. It is also recognized as the only training company in the industry to offer a seamless cross-delivery learning platform for both instructor-led and multimedia training.
Employees: 2,000 worldwide
Net sales 1996: \$164 million

How will technology change the face of multimedia training?

I don't think that a single technology will change the face of multimedia training in a dramatic fashion. How-

ever, the combination of several developing technologies will have a significant impact. For instance, Web-based training will address several business management issues related to employee training, including ease of deployment, centralization of tracking and progress reporting, training on demand, training in the form that [trainees] prefer, and lower cost of delivery.

Benefits of WBT to a trainee will occur when performance-based simulation becomes a standard feature of courseware. The best way to build skills and job competency is to have a [trainee] perform the necessary skills during a training session. Simulations, not "watch while I show you how to do it" or "click where I show you where to click" training segments, enable competency. Real-time, interactive 3-D graphics (available in the near future) will make simulations even more powerful and realistic.

What advice do you have for T&D readers involved in multimedia training projects?

In order to build truly effective multimedia training products, you must combine the efforts of content experts, instructional designers, and software developers.

That collaboration is a must, whether the resources are all internal or result from some type of partnership or work alliance. Both [approaches] have their positives and negatives. It is difficult to locate and compensate the required talent within the confines of a single organization. Companies that can do that generate greater profits on their own than via a partnership. Partnerships can be difficult to manage because the parties don't necessarily share common goals, even though they can benefit from the success of a collaboration.

Sacha Cohen is technology editor of Training & Development. Phone 703/683-8137; e-mail scohen@astd.org.