

# TECH

TOOLS & TRENDS FOR SUCCESSFUL PUBLISHING

3D

## MAKING IT REAL

Web3D adds depth to the way people see things on the Web. **BY JANE VEEDER**



Greg, IBM's virtual editor's guide, takes a group of visitors (multi-user avatars) through the IBM testing lab.

**W**eb3D might be the latest new thing but, like the proverbial actor who gets "discovered" after 10 years in the business, Web3D and its parent, virtual reality, have been hard at work for some time. After more than a decade of research, virtual reality is widely applied to tasks ranging from endoscopic surgery to curing people of their fear of heights, training surgeons to training soldiers, designing architecture to designing molecules.

Some applications are closer to being used every day than others but it is now proven that interacting with a 3D informational environment as we do with the physical world is immensely effective at facilitating perception and learning. Because of this, it is reasonable to expect that interactive 3D will eventually be used everywhere it is appropriate. Enter Web3D.

Web3D's original incarnation began in 1994 with the development of Virtual Reality Modeling Language (VRML) through the efforts of the community of Internet developers and Silicon Graphics. Of course, all the parts were not in place for a full flowering, but the initial implementation was something to rally around.

The current resurgence rests on a number of new factors, including faster modems, a large installed base of inexpensive, 3D-accelerated home computers (thanks to gamers), faster CPU speeds and software developments like Java. The current term, Web3D, is more general in application, spanning non-interactive, real-time 3D animation as well as virtual objects that can be manipulated and spaces that can be navigated.

Right now, Web3D activity is characterized by great diversity in its players, applications and technologies. There are large and small companies, VRML and Java, open and proprietary formats, technology and content development, downloading and streaming, plug-ins and non-plug-ins. The Web3D Consortium ([www.web3d.org](http://www.web3d.org)) is an alliance of corporations and working groups that is developing the next open source generation of VRML, code-named X3D. X3D will be compatible with XML and will not require plug-ins. But whether X3D, a proprietary format or a dark-horse game architecture will ultimately become the standard is anyone's guess. Some players see the ultimate goal as "Rich Media," with multiple media formats combined on the Web and 3D playing only one of the parts.

Exploring Web3D sites requires patience. The landscape is littered with several different browser plug-ins and players, some VRML-compatible, some Java3D, some completely proprietary, some Mac-compatible, some only for the PC. Any given Web site may be viewable with only one of them.

Undaunted by the still-emerging Web3D technology picture, a growing number of creative companies are experimenting with content and, hopefully, giving the technologists cues regarding which way to go. A large proportion of the production work has been demon-

stration projects within a fluid environment of joint ventures, as everyone attempts to figure out what Web3D is good for. At this point, the benefits of Web3D appear to center upon the following: Connecting a Web-scale audience to things already done in 3D graphics or virtual reality; enhancing decision-making about three-dimensional objects or spaces; and making physically distant collaboration more compelling and effective, in some cases as an interim solution until video teleconferencing bandwidth is available on the Internet.

### E-commerce

It's no surprise that e-commerce is expected to become the largest application area of Web3D. Retail applications include modest offerings of 3D objects for interactive inspection, such as those from MiniDisco's Web site ([www.minidisco.com/minipictures3d.html](http://www.minidisco.com/minipictures3d.html)), which uses Metastream's streaming 3D technology, and interactive marketing extravaganzas, such as ExciteExtreme's 3D Holiday Shop '99 ([www.exciteextreme.com](http://www.exciteextreme.com)) by Shout Interactive.

Interesting business-to-business applications by Technicon ([www.technicon.com](http://www.technicon.com)) include Offices Online™ and ShowRoom™, both custom VRML environments for integrating online construction product selection, specification and ordering. UMA Holding Co. ([www.umaholding.com](http://www.umaholding.com)) in Vienna, Austria, has created examples of virtual real estate for online marketing of large development projects, and is moving into 3D multi-user business communications, such as virtual tradeshow and stockholder meetings. Berlin's Lunatic Interactive's ([www.lunatic.de](http://www.lunatic.de)) projects include a virtual sales training site for IBM, a 3D lawnmower product manual and a tax consulting and legal advice virtual community.



Greg ushers users into the IBM resellers training center.

### Entertainment

Entertainment applications are varied and include the extremes of non-interactive content, such as animated sequences from companies like comic site dotcomix ([www.dotcomix.com](http://www.dotcomix.com)), and the most immersively interactive, including online games like Quake and 3D chat worlds such as Cybertown ([www.cybertown.com](http://www.cybertown.com)).

### Education and training

In addition to independent efforts in higher education, the Educational

Universe of ActiveWorlds (<http://edu.activeworlds.com>) hosts "worlds" for more than 100 schools and government and training programs. These worlds run a variety of collaborative projects, such as designing a new high school, online PTA meetings for a rural area, language labs and distance

learning. Companies are also using Web3D in e-commerce sites for customer training applications (product assembly) and employee training.

### Design and development

The quickly growing area of computer supported cooperative work now includes Web3D-based online collaborative design and development environments. CoCreate's ([www.cocreate.com](http://www.cocreate.com)) OneSpace product supports a flexible, online CAD design process where each participant can change the com-

## RESOURCES

**Web3D RoundUp:** A traveling event combining The Battle of the Bands and The Gong Show, featuring fast, live demos of all the Web3D players. The participating companies are linked to the Web site at [www.web3droundup.org](http://www.web3droundup.org).

**3D Advanced Graphics and Animation:** 3Dgate magazine's special spring issue on Web3D. The issue's valuable Tool Developers list is at [www.3dgate.com/magazine/2000/0208](http://www.3dgate.com/magazine/2000/0208).

**Web3D Consortium:** [www.web3d.org](http://www.web3d.org)

**About.com:** Includes all kinds of information, such as links, a listserv and weekly chat at [www.web3d.about.com/compute/web3d/mbody.htm](http://www.web3d.about.com/compute/web3d/mbody.htm).

#### Browser plug-ins and proprietary players:

[www.blaxxun.com](http://www.blaxxun.com)

[www.pulse3d.com](http://www.pulse3d.com)

[www.shout3d.com](http://www.shout3d.com)

[www.karmanaut.com/cosmo/player](http://www.karmanaut.com/cosmo/player) (Mac VRML plug-in)

[www.metastream.com](http://www.metastream.com) (streaming 3D player and list of links)

## NO SURPRISE, E-COMMERCE IS EXPECTED TO BE THE LARGEST APPLICATION AREA OF WEB3D.

mon database and quickly update the results.

### Art, design and architecture

Adventurous artists and designers always participate in the early exploratory phases of any new technology, and help visualize the potential for mainstream commercial players. Interesting collections of international art and design projects can be accessed at VRML-Art 2000 ([www.vrml-art.org](http://www.vrml-art.org)). Of civic note is the City of London Visualization Project ([www.casa.ucl.ac.uk/virtualworlds.htm](http://www.casa.ucl.ac.uk/virtualworlds.htm))—combining history, city planning and virtual community involvement—and a joint online exhibit with the City of London Museum on London's bridges ([www.casa.ucl.ac.uk/londonbridges](http://www.casa.ucl.ac.uk/londonbridges)).

### Multi-dimensional challenges

For those used to a 2D Web, designing and developing for 3D involves a different mental model. But the results of the mindset switch may be worth it.

Consider the relative information carrying power of 2D vs. 3D and consider whether the 2D Web might have reached its limit. At the recent Web3D Conference, Bastiaan Schönhage from Vrije University, The Netherlands, presented a case study applying Java3D to visualizing business process data for a large social security firm. The analysis showed that 2D was superior for speed, control and acceptance, but that interactive 3D offered greater information density, multiple perspectives on the data, variety of manipulation, and the ability to compare past, present and future. The findings also indicate that to successfully wrangle interactive, desktop 3D information visualization into an accessible experience, a lot of design experimentation needs to be done. This also applies to using Web3D for navigation. While Web3D takes advantage of skills and perceptions learned from operating in a 3D world, these can only partially benefit non-



Sister Randy, of the popular Dotcomix cartoon, "Sister Randy."

immersive desktop environments as compared to fully immersive virtual reality. On the other hand, as we try to accomplish ever more complex tasks over the Web, we run the risk of creating 2D user interfaces of hopeless complexity. Interactive 3D offers a strategy for coping with this.

For Macintosh users interested in getting their feet wet, a major obstacle is that Web3D lives largely on the PC. Apple has had difficulty appreciating 3D, only licensing the OpenGL graphics standard in 1999. Reportedly, the introduction of Mac OS X will make the Mac an easier platform for porting, but be prepared to be at the end of the line for releases, if they ever come at all. Most Web3D browser plug-ins are compatible with the Mac (with restrictions) but authoring tools are still almost exclusively Windows NT.

Another practical obstacle to increasing the amount of 3D on the Web is the cost of 3D graphics and animation production. Addressing the object creation problem, there are currently two types of products for capturing the geometry and surfaces of physical objects: camera-based scanners and software that converts 2D images into geometry and textures.

Online catalog sales may require such extremely high fidelity to the original form and color that only the highest quality 3D graphics production will do, but more flexible applications such as chat rooms and small-business Web sites have already begun to stimulate a cottage industry in less-expensive clip-objects.

Taking on Web3D could incur additional costs for animation, but the current trend toward a more dynamic Web demonstrates that it may be money well spent. Recently, fast loading, vector-based Web graphics have given 2D animation a new screening venue in addition to lending text and interfaces a more dynamic look. Now 3D animation is getting into the act with streamed or quickly downloaded sequences animated in real time.

Another consideration is that including interactive, real-time 3D content might well require some changes in Web production pipelines and staffing. Janis Nakano Spivack, an art director with Organic Online, is already grappling with this challenge. "Now the most proven use of Web3D is in demos of objects—for example, viewing the interior and exteriors of cars," she explains. "To go beyond that, I am experimenting with hybrid design teams that might, for instance, combine a game designer with a Web-savvy, flat-art graphics person."

The compelling utility of 3D virtual reality added to the huge audience and communication potential of the Internet makes for a heady combination. The diverse range of applications, goals and approaches is encouraging. But the most impressive characteristic of Web3D today is how much more experimentation, design and development has yet to be done before we exhaust its potential. **B**

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