

3D via the Web and the New WWW: World Within World

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Abstract

From sparsely connected bulletin board systems to monolithic online services like America On Line, we broke the mold when we embraced the world wide web as the medium where anyone could publish content as they saw fit. 3D worlds also moved from connected first person shooter games to monolithic 3D social worlds. Now the architecture is almost entirely in place for anyone to publish 3D content as rich or as lean as the imagination allows.

1 From Bulletin Boards to the World Wide Web

When we were first learning to interact with people on remote computers there were Bulletin Board Systems (BBS) where users who were close geographically (or could afford long distance phone calls) dialed in and exchanged email, ideas, and files. Many of these BBSes were successfully linked to each other by Fidonet and other services to exchange data.

Eventually companies poured money into systems to build major cross-country and international worlds such as CompuServe, Prodigy, and America On Line. These successful online communities were isolated from each other, but they provided users with impressive and appreciated content. The content was provided by 1) the service itself, 2) customers paying for space, and 3) the community of users.

When the World Wide Web first came on the scene, enabled by the HyperText Transfer Protocol (HTTP) and HyperText Markup Language (HTML), there was not enough content available to entice people to switch from their on-line provider to this new medium, but then individuals and companies realized that they could publish content and provide a virtual presence without having to go through the stove piped providers. Anyone with a web server could have complete control over what visitors saw when they visited a site.

Since those early web days, new capabilities, such as dynamic HTML, scripting, and new realizations, such as scripts both making their own connections *and* modifying pages dynamically (commonly referred to as Web 2.0), new classes of applications have arisen and user expectations have grown. Users want rich,

interactive content. They expect to see who is online and what their friends are doing. Social networks and collaboration tools connect users synchronously and let them coordinate on shared data. They also want immersive 3D worlds.

2 From 3D Games to World Within World

When users first learned to interact in 3D worlds, gaming companies connected their customers to online communities, usually in the form of “first person shooter” games. Although Game A from one company could not talk to Game B from another, the experience was new and exciting and led to a boom in the gaming industry. As with the BBSes of old, participants could interact with others of similar interests—namely, the game they were playing. While few companies embraced talking across games as with the Fidonet of yesteryear, the United States military forced its vendors to provide simulations that could talk in a common language to avoid the dreaded “lock-in.” (These simulations use two protocols known as Distributed Interactive Simulation (DIS) and High Level Architecture (HLA) to try to ensure Simulation A from one company can talk to Simulation B from another).

Soon companies began investing significant resources into becoming the next Compuserve or America On Line in the social, 3D world. Now individuals and companies can exchange real money for virtual money, purchase “land” in a provider’s virtual world, and build it up within the confines of that company’s architecture. Again these provide users with impressive and appreciated content, and the content is again provided by 1) the service itself, 2) customers paying for space, and 3) the community of users.

These 3D world providers offer what might be considered an irreplaceable side effect of moving to a 3D world that models reality: they are the brokers who decide that this piece of land “belongs” to this customer and that land to another. If we miss the sleight of hand, we might think that we are stuck with this model.

There is already another model for taking control of our own content and publishing as rich or as lean an experience as we can imagine. It is the World Wide Web, and the new WWW is World Within World.

3 World Within World Real Estate

Instead of tying oneself to a single “world” where everyone is vying for a piece of it, one can publish a world that links to others as the current web does. The architecture is right under our noses and is almost entirely ready to execute.

From a hyperlink in either kind of WWW a user could connect to an immersive 3D world just as easily as loading a traditional web page. Depending on the sophistication of the 3D site, users might click on doors (one of several apt metaphors for the new hyperlink) to move to a new room or they might move from one room or field to another as content is dynamically paged in, just as

successful Web 2.0 sites do now. A door might lead to another area of the same site or to another site altogether—a World Within World.

The original architects of the web gave us HTTP and HTML, and now there is X3D, which is the World Wide Web Consortium’s (W3C) standard for 3D modeling and a good start for 3D markup. The social networks learned the algorithms for connecting friends with common interests. The online forums learned how to report who is live and online in real time. The Web 2.0 crowd learned how to interact dynamically with content and report back to a host server. HTML 5 even proposes server-side event generation to more easily enable live data feeds—a boon for companies wishing their 3D presence to include a reflection of other users in the system.

4 Your Presence in a World Within World

In the simplest case, a user’s avatar (their presence embodied in the 3D world) might not see any other humans except those provided by the hosting site, possibly driven by cognitive models to resemble real human behavior. A social networking site however might reflect back to the user others who are in a room of interest. And who says avatars have to resemble uglier versions of ourselves? If an avatar is also just another bit of markup, the artistic among us can build designer bodies that can go with us from world to world. In some worlds a user’s avatar may not be humanoid at all. A flight simulator could instead become a World Within World browser with your favorite airplane being your avatar. A fantasy world might have dragon avatars as easily as knights.

Content providers have complete control over what their world looks like and how a user interacts with it. Will you provide training to employees or recruit new people? Will you show off 3D models of products in your retail store? Will you let users try on clothes on their designer avatar bodies? Will you be a portal to other worlds, offering users a 3D Main Street experience?

5 What Are We Missing?

Many of the required components for the new worlds already exist: web servers, HTTP, server- and client-side scripting, 3D markup languages. Absolutely critical will be the presence of avatar-aware, 3D applications which render 3D content and provide motion for the avatars and interaction with the environment.

There are plenty of questions to answer on how best to represent avatars, how to communicate interactions with the server, how to redistribute data about fellow users, and more. How should the specifications support both a ballerina’s graceful movements and a more generic description of movement from Point A to Point B? How can these worlds provide new behaviors for avatars (trying on virtual clothes, learning a virtual dance, holding an object its hands)? Do avatars follow a user from site to site (this may be a chance for OpenID to shine)? How much can Asynchronous JavaScript and XML (AJAX) via the

Transmission Control Protocol (TCP) sustain synchronizing avatars in the social 3D worlds?

These questions and more will someday be answered, but in the meantime, we are close to realizing a 3D web where anyone can publish content and where worlds effortlessly hyperlink to other worlds. A ubiquitous, immersive, virtual 3D world is in fact nearly a reality.