

Culture and Web3D: Experiences in Building a Virtual Beer Festival Site in 3DML

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Abstract

This paper investigates the techno-cultural issues surrounding Virtual Reality on the present-day Web, or 'Web3D', over the Internet by developing as its illustration a particularly UK (United Kingdom) cultural event, the St Albans Virtual Beer Festival, which mimicked the actual, real beer festival that ran in September 2000. Given the planned cultural focus and the short turnaround of time available, the authors employed the semiotically-inspired SMDF (*Shared Meanings Design Framework*) in the form of the *Shared Meanings Spot Development Framework* (SMSDF), and 3DML (an XML-derived Web3D markup language) to implement the Virtual Beer Festival rapidly. The virtual beer festival was analysed, designed, implemented and user-evaluated in three months, in time for the actual festival. As well as raising tremendous publicity for the real festival, the virtual site's development raised issues as much to do with the simple mechanics of building and using the virtual site, as well as addressing user diversity and culture. This paper offers valuable experiences from which future work on the vital topic on culture and semiotic in Virtual Reality can progress.

1 Introduction

We live in a 3-dimensional (3D) world, yet we mainly represent it, in paintings, the handwritten/printed page, television and cinema, the computer screen including the Internet/World Wide Web (the 'Web') as 2-dimensional (2D). Semiotic, being the 'science of signs' has thus intentionally (or, more often, unintentionally) been a way of representing the many cultural facets of the real 3D world (through icons, symbols and indexes) in 2D [1, 2]. Now that technology is allowing us to represent 3D in 3D i.e. Virtual Reality we need to consider the role of semiotic in this new, virtual aspect [3]. Thus Johansson's statement that "'transparent visualization" is possible only by means of a certain communicative competence which is to be acquired as part of one's cultural "upbringing". Such competence is usually understood in terms of semiotics, cognition, and media, - that is of the "language", or sign system applied in a given visual media and its correspondence with cognitive agencies of the mind. Accordingly, "transparency" are thus only seen as an effect of a certain organization of signification and/or of a certain cognitive disposition." is as particularly apt in the (virtual) 3D sense as it is in the 2D one [4].

We thus decided to investigate the techno-cultural issues surrounding Virtual Reality on the present-day Web, or 'Web3D', by developing as its illustration a particularly UK (United Kingdom) cultural event, the St Albans Virtual Beer Festival, which mimicked the actual, real beer festival that ran in September 2000 (<http://www.hertsale.org.uk/>).

1.1 Background to the Virtual Beer Festival

CAMRA (The *Campaign For Real Ale*, <http://www.camra.org.uk>) is an independent, voluntary, UK-based consumer organisation, promoting traditional beers, ciders and perries. In its publicity it states that "CAMRA saved real ale, it is no exaggeration to say, and as a result saved many independent breweries. No new ale breweries were set up in the UK for the fifty years before we were founded. There are now around 300 new brewers producing real ale, part of a massive real ale revival." (<http://www.camra.org.uk/site/camrainfo/camrainfo.htm>, accessed November 2000.)

As part of its public awareness campaign and fund raising CAMRA organises beer festivals at various sites throughout the UK. CAMRA's South Hertfordshire branch (<http://www.hertsale.org.uk>) organises their annual beer festival each September. The beer festival plays a major role not just as a fundraiser but also to keep local people informed about CAMRA's work, and the vast range of beers that are still available. The culture of the actual beer festival as embodied by its components, the 'Main Bar', 'Stage/Champion Beers Bar', 'Foreign Beer Bar', 'CAMRA shop' and background ambiance (including sound) are essential parts of the festival. They thus need to be captured in the virtual beer festival too. People are the key element to the beer festival: they talk to one another; they try, buy and ask questions about the drinks offered, and they may decide to join CAMRA. They visit the beer festival to have fun. Now imagine visiting a virtual beer festival. Walk around the entire festival even without moving from your desk that may be physically located many 1000's of miles away. You will not be able to taste the beer of course, but it might encourage you to visit the actual beer festival if you found the whole virtual experience pleasant. Or, if you are simply too far away or otherwise cannot get to the actual festival, you can, through 3D, actually experience its cultural sense.

1.2 Web3D

Is 3D however better than 2D? Neilsen argues that using 3D on present computers adds a range of difficulties [5]:

- The screen and the mouse (cursor) are both 2D devices.
- Poor screen resolutions make it difficult to render remote objects.
- Software needed for 3D requires an extra download.

But we are already used to 3D displayed in 2D spanning centuries. Perspective in paintings, television, computer games to mention a few. In these cases, with 3-dimensional objects, having height (x), width (y) and depth (z) co-ordinates, the 'z' coordinate is arguably represented faithfully in 'x' and 'y'. As humans, from such stimuli we assist this process by 'imagining' the third dimension from x and y [6]. Thus even as 3D-in-2D, intuitions come more naturally to human beings than 2D alone [7]. Indeed "The biggest contribution 3D will bring to the Web is a proliferation of 3D social environments: Virtual chat-rooms, electric communities, games, town halls, shopping malls, amusement parks ... they fulfil a basic human need to be part of a simulated world" [8]. Hence the interest in 'Web3D': 3D on the (present day 2D-based) Web.

1.3 3DML

3DML (<http://www.3dml.org>) is a Web3D markup language derived by Flatland (<http://www.flatland.com>) from XML (eXtensible Markup Language, <http://www.w3.org/XML/>). In 3DML a world or scene is called a "Spot". Once inside a spot the user can navigate around using arrow keys or with the mouse. The 3DML development environment offers a full, rapid development environment. 3DML is lightweight and fast and 3DML files are very small thus permitting rapid access too by users [9]. 3DML files can be viewed in popular Web browsers with an easy-to-download-and-install viewer from Flatland's Website.

2 Semiotics

Semiotics, in recognition of its fundamental role in addressing culture, has been applied to Information Technology (IT) and the Web [10, 11]. The SMDF (Shared Meanings Design Framework) consists of a carefully sequenced application of various semiotically enhanced (or semiotically focussed) techniques particularly applicable to the Web and Ecommerce [12]. In the virtual beer festival the user navigates the site through visual signs. Many users may not have visited an actual beer festival (particularly from 'different' cultures?) thus we need to provide the user with as much navigational aid as possible.

3 The Design Framework: SMSDF

Derived from SMDF by Singh, the *Shared Meanings Spot Development Framework* (SMSDF) approaches the analysis and design of a Web3D application in 3DML from a HCI and semiotic viewpoint [7]. The use of this new approach for developing the virtual beer festival would test and consolidate its proposed theory. Accordingly we now address the stages of SMSDF in the context of the virtual beer festival.

3.1 SMSDF Stage 1: Determine Scope and Context

Typical users of the site were identified as being:

- People who are particularly interested in Real Ale but are unable to attend the festival, or want to preview it before their arrival at the actual festival
- Any inquisitive person from any background wanting to know more about the beer festival
- Suppliers (e.g. breweries who supply the beers to the festival) and/or other stakeholders in the festival

The specification of the virtual beer festival site itself was identified as:

- To build the Virtual St Albans Arena (the Arena being where the actual event is held in St Albans), using 3DML
- Design and build the its components: virtual bars (Main Bar, Stage/Champion Bar and Foreign Beer Bar), 'pet shop' (a theme bar for real ales that have the names of pets in their name e.g. 'Top Dog'), toilets and refreshment area
- Incorporate the information centre, and various stalls to mimic their real life equivalents
- Integrate sound in the background
- Allow the user to see the list of beers available at each bar, identified semiotically by barrels, bottles or handpumps
- To have virtual crowds of people on the virtual site 'to bring it to life'
- Lastly but not least, the user should be able to navigate around with ease

3.2 SMSDF Stage 2: Paper Design

This involved the design layout (birds-eye-view) of the spot, the basic sketches of interior of the spot and basic sketches of exterior of the spot. This stage mainly focuses on the shape and size of the spot. In practice we found that this stage of the framework was only helpful as amorphous guidelines. We had the plans of the entire St Albans arena. Also having seen the actual arena, drawing the basic sketches of the interior and the exterior was not required. With photos and plans to help design those details, we could progress.

3.3 SMSDF Stage 3: Orthographic Views

This stage brings together the analysis of the Stage 1 and the design ideas of Stage 2 into a defined design that can be used to create the 3DML for the virtual beer festival. This stage is further divided into 3 tasks. Orthographic Views of Exterior, Orthographic Views of Interior, and Design Looks of Walls. Again, we found that having seen the arena this exercise was not required. (Indeed we felt that the design framework for stage 2 and stage 3 is more useful for designing prototypes for some abstract sites or those things that physically do not exist e.g. a fantasy gaming environment.) The Entrance to the arena, Main Hall (where stage and champion beer bar will be) and Lower Foyer (for foreign beer bar) would be separate, interlinked spots. This would make each 3DML spot size smaller providing the user with better navigation. Also the user would have to wait less time to download whilst on line. It would also be easier to maintain and update the code in future.

3.4 SMSDF Stage 4: Merge Blocks with Orthographic

At this stage the orthographic views of the spot are directly related to how the spot will look when completed. This is where knowledge of 3DML itself is required. It is a pre-implementation stage. It has been further divided into 4 more tasks. They are Identify Spot size required, Identify number of Map Levels, Map Available Block Shapes onto Orthographic Views, and Modify Orthographic Views to 3DML block characteristics.

Identify Spot Size Required: The size of the spot has to be defined in the header of the 3DML code in terms of x, y and z co-ordinates (width, depth, height). It is vital to design the correct spot size. The whole 3DML implementation depends on the spot size. If the spot size is too small user might feel uneasy and if it is too big the user might feel lost in the spot world. It was also decided that the width of all the spots had to be the same. This would give the feeling of consistency inside the "Spot" world. A problem noticed early on when trying to get to grips with 3DML was that if the spot was too large then the horizon (where any two sides meet) would be blurry with background texture full of the ambient texture. Ambient texture has to be defined in the header of the 3DML code as well. As the project

user to navigate in the spot with ease it was decided to place signs at strategic places. (See their use in Figure 1 for example.) The signs had to be simple but meaningful. The CAMRA logo (see Figure 2) was used as the base of the signs, where the letters CAMRA were substituted by, say, arrows or other text. This gave dual meaning to the signs, by promoting CAMRA itself and at the same time giving the user a good navigational aid.

3.7 SMSDF Stage 7: Aesthetic User Testing of Spot

At this point in the development the aesthetics and design of the spot are tested. This will provide the measure of how closely the spot resembles the original specification. The author wanted to have the user feedback as to how comfortable they felt regarding the overall size of the spot.

The real test of the virtual beer site of course would be actual users. The details of the user evaluation are detailed elsewhere, in the one of the reports from which this paper is mainly derived [13]. (The other is SMSDF [7].) Six members of the CAMRA branch, and six general subjects were asked to use the site and their reactions recorded using simple heuristic feedback and elementary questionnaires, given the short turnaround time for this work. The majority of people commented that it took them some time to get used to navigating around the spot; other comments were made about some of the textures that were used in the spot. Most users commented that more navigational aids would be helpful. But all the users were satisfied with the overall size of the spot. Below is a brief summary of the specific responses received from the users:

3DML Software: Most users did not have much difficulty in downloading and installing Flatland's add-in software (called 'Rover').

Introduction: three-quarters of the users were satisfied with the introduction page and its presence was appreciated. The idea of the introduction page is to give adequate guidance to the user. The rest (one-quarter) did not think there was any need for the introduction page.

3D Interface: All the users were comfortable about the 3D interface and particularly appreciated the colours, the textures and all the signs provided inside the arena. (They could not access the beer details as we were still in the process of constructing the backend database for this purpose.) Also some users did not like the popup text messages describing, say, where to pick up the drinking glasses.

Sound: Generally all the users enjoyed the background sound. Some users found it annoying after a while. Some of them also complained about the US American accent. This was a facet of the text-to-speech software used that was otherwise quite comprehensive. The festival is a very 'UK thing' and clearly the sound of a US American does not complement it. But as it happens, in this year's beer festival the foreign beer bar had many beers from the USA! All the users eventually wanted no background sound, particularly the 'crowd' noise.

Overall Impression: The main comment that was noticeable was the lack of people in the 3D interface. The presence of people would have been a significant cultural icon, but 3DML simply couldn't support it. (This could also explain why the 'crowd' sound became irritating, as there were no visual crowd to go with it!)

4 Comments about SMDF and SMSDF

The use of SMSDF proved very useful in developing the Virtual beer festival project. It helped in identifying many of the problems early on in the project's development. We would like to make a few comments about the SMSDF framework.

The framework appears to be more directed towards abstract virtual reality scenarios (like fantasy gaming environments to which, incidentally, much 3DML effort is presently directed). But for an application of a real physical counterpart such as this project, things like building plans, approaches surrounding visits to the actual place or some communication in the form of photographs or video footage should be incorporated. As stated earlier we simply ignored this part of SMSDF, but was that inappropriate? We were undecided, as we couldn't identify any ramifications from this, though we sensed they might be there...

Another important aspect that we feel should be included is hosting the site on the Web. SMSDF is about developing a Virtual Web Site. Though hosting the site is essentially a mechanical process, it's still significant thus we felt the framework needs to address this practical issue as well.

4.1 Advantages, Limitations and Future enhancements of 3DML

An important advantage that 3DML has over the other Web3D technologies such as VRML, is its speed. 3DML requires no prior knowledge of trigonometry or logical programming as it is based on

blocks and Blocksets. The whole interface is much easier to build compared with other 3D interfaces [7]. The size of 3DML files is relatively very small. All files put together in this project add up to a mere 68kbytes. But when one starts to add the time taken to download all the textures and sound the time escalates. The average time taken to download the Virtual beer festival was approx. 4-5 minutes!

As already indicated both the Microsoft Internet Explorer and Netscape Navigator Web browsers support 3DML files with an easy-to-download-and-install add-in. In contrast VRML requires an entirely separate and large browser, such as CosmoPlayer or Cortona [14].

For development, we used the downloadable 'Text Pad' editor (<http://www.textpad.com>) which supports 3DML. This has all the tags syntax defined saving time having to remember the syntax. Note that, as stated earlier, there is no visual development environment for 3DML however, meaning examples that the code extract illustrated earlier has still to be done by hand!

One of the key, fundamental drawbacks of 3DML is that it does not support any kind of scripting support (e.g. via JavaScript or DHTML equivalent on the client side, or the server side). Many dynamic options (e.g. interactive tailoring to the user) were thus lost without very intricate programming, thus losing the advantage of its rapid application. Why Flatland did not provide this mystified the authors, despite our requests that they should if 3DML is to be taken seriously.

As highlighted earlier there is no means for including people in the spot (other than putting 'gif' images of humans, a very bandwidth heavy option!) making the whole spot feel 'empty'.

We anyway draw together the strands of our discussion by providing an illustration of the virtual site as given by the screenshots of Figures 3, 4 and 5.

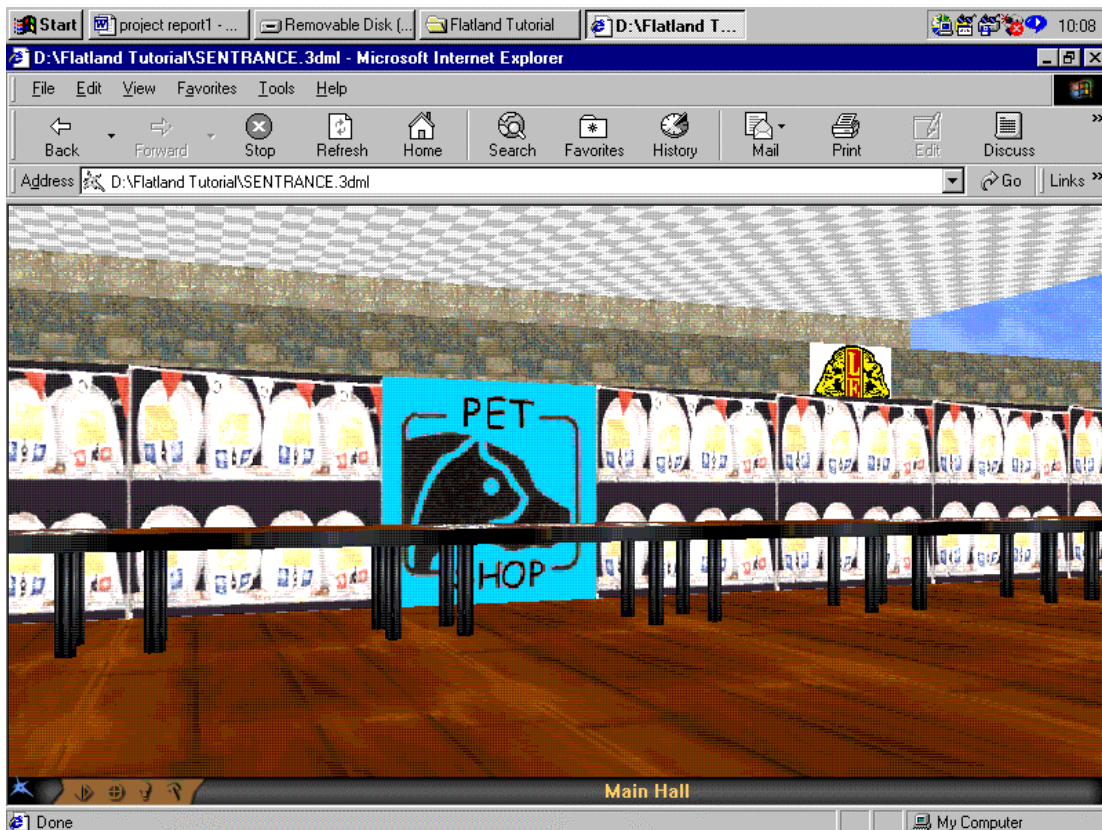


Figure 3: Main bar, showing 'Pet Shop' theme bar



Figure 4: Foreign Beer bar

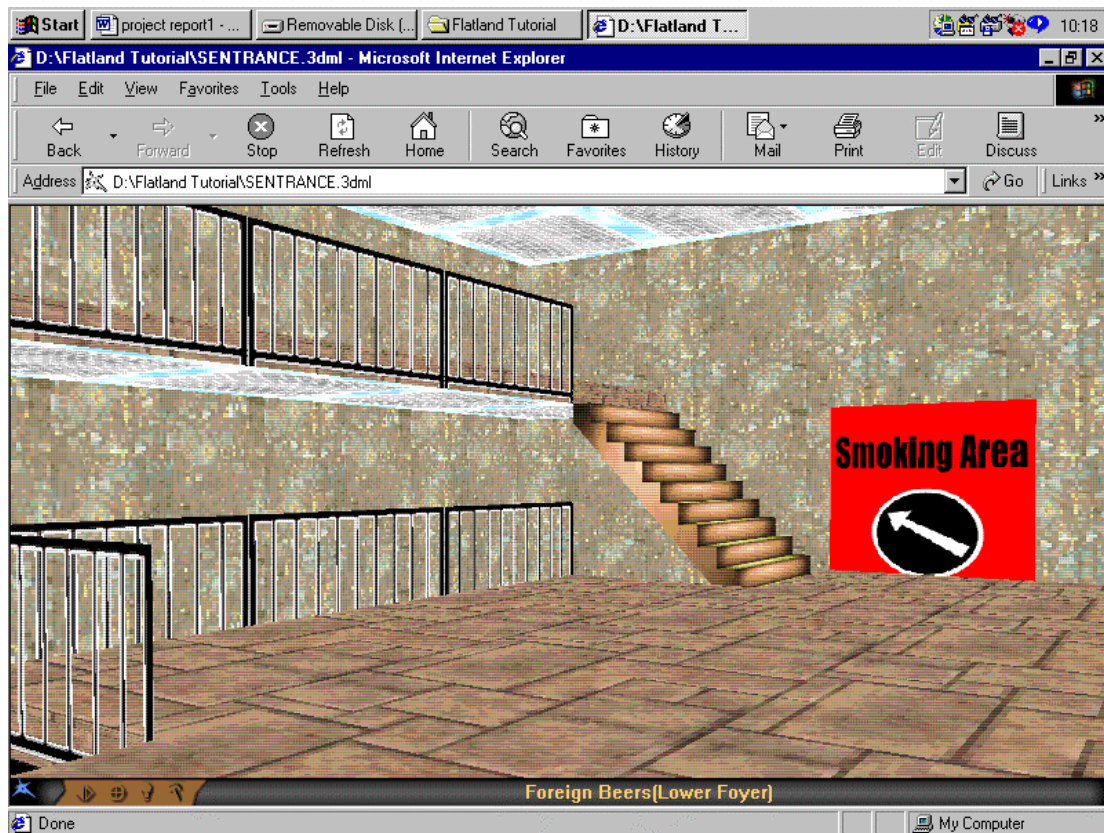


Figure 5: Lower Foyer (Landing)

5 Concluding Remarks

The prime objective of this work was to explore the role of semiotics and culture in Web3D, by building the St Albans Virtual Beer Festival Website. We thus used SMSDF and 3DML.

The project was completed on time and it went live just before the start of the actual St Albans beer festival. The Virtual festival can be seen at <http://spots.flatland.com/bhavin/> and is linked from the CAMRA South Herts Branch Website (<http://www.hertsale.org.uk>). Being the first of its kind it raised a lot of good publicity for the actual festival, and CAMRA. (As well as local media coverage, we were informed that it made the BBC's ceefax teletext pages, which we felt for us was quite an achievement!)

As well as raising this tremendous publicity for the real festival, the virtual site's development raised issues as much to do with the simple mechanics of building and using the virtual site, grappling with 3DML, as well as addressing user diversity and culture. Nonetheless we have significantly progressed from Johansson's comment that "Unfortunately however, research in web-based 3D-visualization still lags far behind technological development and actual application. Consequently, 3D-visualization technology is usually employed at haphazard, that is with no strategic insight in each media's particular advantages and probably only in respect of whatever appears to be functioning "effectfully", "naturally", or with some kind of aesthetic value. By the end of the day, this means that planning communication management is totally dominated by technology, and that intuition prevails a critical and analytical knowledge of the media." [4]

We therefore conclude that this paper offers valuable experiences from which future work on the vital topic on culture and semiotic in Virtual Reality can progress.

6 References

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