Chapter 24
Self-Developing a MUVE for Research and Educational Innovations

Nick V. Flor
University of New Mexico, USA

ABSTRACT

Multi-user virtual environment (MUVE) researchers need to create their own virtual worlds and to stop waiting for industry to create innovations. The technology and instructional materials for creating virtual worlds have advanced to the point where a single person, unaided, can develop a virtual world that is suitable for experimentation—even though it may lack the aesthetics of commercially available worlds. The aim of this chapter is to demystify the development of virtual worlds by describing the fundamental skill set you must acquire to self-develop a virtual world. The skills are: modeling, texturing, animation, and programming. The author focuses on two of these skills, modeling and texturing, and describe a set of core techniques for creating the exterior of a virtual world. By practicing and building on these techniques, one can create the interiors and characters for more complex MUVES.

INTRODUCTION

As both an information systems and a new media researcher, I find it frustrating that we are in the midst of a technology revolution, yet unlike the natural sciences where academia leads the discovery of innovations, it is industry that is leading the discoveries. For instance, the dot-com revolution yielded innovative Web sites and social networking services like eBay, YouTube, Twitter, Facebook, and Wikipedia. And what is astonishing is the simplicity of the technology underlying these sites. Many were built initially by one or two individuals in several weeks or less. For example, the technology for EBay was created by a single person over a Labor Day weekend as part of an exercise in internet programming (Cohen, 2003, p. 4).

Unfortunately, many information systems researchers seem content to be stenographers of industry—using statistical and qualitative techniques from the natural sciences to essentially

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describe the innovations created by industry. As such, much of information systems research lacks relevance (Benbasat & Zmud, 1999). This should not be the case. We need to realize that we are part of what Nobel-laureate Herb Simon calls a "science of the artificial" (Simon, 1996), and both the design and the creation of innovations are crucial research activities.

The importance of doing design and implementation—in addition to natural science approaches to studying information systems—has been argued in the past (March & Smith, 1995), and a design science is starting to emerge (Hevner et al., 2004). The main difference between design *science* and "plain-old" design is that the goal of design science is to create new knowledge for a community, whereas design as practiced in industry does not necessarily create new knowledge.

We find ourselves in the midst of yet another technological revolution—the multi-user virtual environment (MUVE) or virtual worlds revolution—with the potential for radically new forms of research (Bainbridge, 2007). Either we continue studying *post hoc* the innovative virtual worlds created by industry like Second Life, World of Warcraft, and Guild Wars, to name a few; or we create our own innovations.

The question is: given the seeming complexity of virtual worlds, is it reasonable to expect information systems researchers to create them? The general perspective of this chapter is that, similar to the web innovations mentioned earlier, there are many virtual world innovations that information systems researchers can build. Moreover, both the technology and the instructional materials needed to build virtual worlds have advanced to the point where a single or a small number of individuals can build one in a relatively short time span.

While the virtual worlds created by academia may not have the awe-inspiring aesthetics found in the virtual worlds that make up commercial games such as World of Warcraft or Halo, one should realize that most of the innovative social networking websites also do not have fantastic aesthetics when compared to the sites that a trained artist can create. For researchers and educators who create virtual worlds as part of a design science, the objective is not an aesthetically pleasing virtual world, but rather a virtual world that leads to new knowledge, e.g., new forms of social problem solving, or new forms of communication across multiple media. Aesthetics is secondary. Besides, often what looks to be a fantastically complex virtual world is the result of a skilled artist creating realistic texture maps, a kind of digital wall paper that gets "wrapped" onto the things in the virtual world.

The objective of this chapter is to demystify the development of virtual worlds by describing the fundamental skill set you must acquire to self-develop a virtual world and to show you how these skills are applied to create a virtual world. The skills are: modeling, texture mapping, animation, and programming. This chapter focuses on the two skills needed to start building virtual worlds: modeling and texture mapping. Within these skills are a core set of techniques that one can use to start building basic virtual worlds. By practicing and building on these techniques, you can create more complex and aesthetically pleasing virtual worlds.

Finally, aside from the practical applications that result from learning the skills necessary to develop virtual worlds, there are research opportunities as well. Currently, the best way to learn the skills for creating virtual worlds is through the trade books published by the makers of the software packages and by professionals. For example, Autodesk publishes books on basic modeling and animation (Autodesk Maya Press, 2009), as well as applying modeling and animation to game development (Autodesk, 2009). Game professionals publish books on specific skills like texture mapping (Ahearn, 2006), or designing levels for games (Co, 2006). However, the techniques for creating these models are based largely on experience and the theoretical foundations underlying these techniques are not explicit. Works by academics