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# From MUDs to MMORPGs: The History of Virtual Worlds

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## Abstract

Today's massively multiplayer online role-playing games are the direct descendants of the textual worlds of the 1980s, not only in design and implementation terms, but also in the way they are evolving thematically.

Thus far, they have faithfully mirrored the path taken by their forebears. If they continue to do so, what can we expect of the graphical worlds of the future?

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## Introduction

Golf was invented in China (Ling, 1991). There is evidence from the *Dongxuan Records* (Wei, Song dynasty) that a game called *chuiwan* ("hitting ball") was played as early as the year 945. A silk scroll, *The Autumn Banquet* (unknown, Ming dynasty), depicts a man swinging something with the appearance of a golf club at something with the appearance of a golf ball, having the apparent aim of conveying it into something with the appearance of a golf hole.

Golf was also invented in France (Flannery and Leech, 2003), where it was known as *palle mail*. Tax records from 1292 show that makers of clubs and balls had to pay a toll to sell their goods to nobles outside Paris. A book of prayers, *Les Heures de la Duchesse de Bourgogne* (unknown, c1500), contains illustrations of men swinging something with the appearance of a golf club at something with the appearance of a golf ball, having the apparent aim of conveying it into something with the appearance of a golf hole.

Golf was also invented variously in Middle Egypt, ancient Greece, ancient Rome (*paganica*), England (*cambuca*), Ireland (*camanachd*) and the Netherlands (*kolf*) (*golf*, 2008).

Nevertheless, despite these assorted claims as to the invention of golf, it's indisputable that the modern game is the product of Scotland[1]. The golf played today is the direct descendent only of the version that the Scots developed. Follow the audit trail from the US Masters back in time, and Scotland is where it ends.

So it is with virtual worlds.

Hitting a ball into a hole with a stick is a fairly obvious idea, so it's unsurprising that what we now know as golf has been conceived as a game many times throughout history. Likewise, creating a virtual world doesn't qualify as an act of genius – it was always going to happen. In fact, as we shall see, the concept has been invented independently at least six times and probably more. Most of these worlds had little or no impact on the future development of the concept, however. Therefore, when it comes to understanding their history, the important question is not

so much which one came *first* as which one is the *primogenitor* of today's virtual worlds.

As it happens, depending on your view of what counts as a virtual world, the one that appeared first chronologically is also the beginning of the audit trail. Before getting into details, though, we should first consider what exactly we mean by the term *virtual world*.

Essentially, a virtual world is an automated, shared, persistent environment with and through which people can interact in real time by means of a virtual self. Let's look at those qualifiers one by one:

- Automated: the virtual world implements a coherent set of rules (its *physics*) that entirely define what changes its real-life visitors (termed *players*) can make to that world.
- Shared: more than one player can be in the exact same virtual world at once.
- Persistent: if you stop playing then come back later, the virtual world will have continued to exist in your absence.
- Environment: the virtual world manifests surroundings in which the player activities take place.
- Interact *with*: players can perform actions within the virtual world which produce results that are relayed back to them.
- Interact *through*: players can communicate with one another under the auspices of the virtual world.
- Real time: the virtual world generates feedback for events pretty well the moment they occur.
- Virtual self: each player identifies with a unique entity within the virtual world (their *character*) through which all their in-world activity is channelled.

In other words, a virtual world is a pretend place that several people can visit at once whenever they like, using their computers.

Under this definition, the first virtual world was probably *MUD*.

# The First Age: 1978-1985

*MUD* ("Multi-User Dungeon") was written by computer science undergraduates Roy Trubshaw and Richard Bartle[2] at the University of Essex, England, in the autumn of 1978. The first, proof-of-concept version took Trubshaw only a few hours to complete, but established the basic software foundation upon which a full virtual world could be constructed. Work immediately began on version 2, which had reached a playable state by December when Bartle became involved (initially, to design content)[3]. This second version satisfied all the criteria listed above, and it would be recognisable as a virtual world by players of such games today.

*MUD* was text-based, meaning that everything the characters did, saw, heard or otherwise experienced was reported in words. In this regard, it could be argued that *MUD* was merely a multi-player development of the early adventure games such as *Colossal Cave Adventure* (Crowther and Woods, 1976) and *Zork* (Anderson *et al*, 1977). This is a fair point, as Trubshaw did indeed draw on his understanding of those games when designing *MUD*[4].

However, *MUD* was as radical a departure from *Zork* as *Zork* was from *Dungeons and Dragons* (Gygax and Arneson, 1974). The puzzle-based, narratively-constrained format of adventure games couldn't work in the setting of a multi-player game: the *world* had to assume dominance, not the problem-solving. Half-hearted attempts elsewhere to create multi-player versions of *Zork* and *Colossal Cave Adventure* foundered on this point. What Trubshaw and Bartle realised was that they had to make *MUD* open-ended, a notion that accorded well with their philosophy of promoting personal freedom[5]. Bartle in particular saw the need to create a new form of gameplay for *MUD* as a means of giving people freedom to be – and become – their real selves (Bartle, 2003).

Version 2 of *MUD* was written in assembly language, and it gradually became more and more unwieldy as features were added. In the fall of 1979, Trubshaw decided to rewrite it from scratch, and began work on version 3 (using BCPL, a fore-runner of C). He had its core working by Easter 1980, but it only did perhaps 25% of what he envisaged. With his finals looming, he handed control of the code over to Bartle (who is a year younger). Bartle finished the engine and wrote almost all the content to complete what, despite its being version 3, was to become known as *MUD1*.

Local players were able to use the *MUD* system to write their own virtual worlds[6]. Non-local players were able to access *MUD* through packet-switching networks[7] and dial-up lines, and it was inevitable that in time they, too, would be inspired to write their own virtual worlds – but on their own computers.

Bartle put the concept into the public domain in 1985.

# The Second Age: 1985-1989

The first *MUD1*-inspired virtual worlds to appear that weren't native to Essex University were *Shades* (Newell, 1985), *Gods* (Laurie, 1985) and *AMP* (Blandford, 1985). They were swiftly joined by the progressive *MirrorWorld* (Cordrey *et al*, 1985) and others. Because these games were all derived from *MUD*, they were referred to as MUDs; this is why *MUD* itself was redubbed *MUD1*.

Although most of these games began as free services, it soon became clear that there was money to be made from operating them. In 1985, *MUD1* launched on CompuNet in the UK and, a year later, on CompuServe in the USA. *Shades* was taken up by Micronet800, which operated independently an area of British Telecom's nationwide Prestel viewdata network. *Gods* and *MirrorWorld* set up their own servers and hosted several virtual worlds on them. While some of these were *MUD1*-inspired, others were derivatives of *MUD1*'s own "children". *MUD* itself was rewritten for the final time as *MUD2*.

All in all, scores of virtual worlds were written in the UK during the Second Age, mainly by enthusiasts of one or more of the "big four" (*MUD1*, *Shades*, *Gods* and *MirrorWorld*) who worked alone or in very small groups. The period is remembered as one of great excitement and experimentation. By 1987, almost all the key coding matters and gameplay tropes had been identified and nailed down; by 1989, so had the social and management procedures, including the protocols and tools for dealing with player problems (what would today be called "customer service issues").

Some degree of commercial success came to *MUD1*, *Shades*, *Gods*, *Avalon* (Simmons *et al*, 1989) and *Federation II*[8] (Lenton, 1989). However, the expensive nature of telephone calls in the UK at the time meant that access to virtual worlds was

effectively a luxury. The university sector did produce some new free games, but few escaped the confines of their host institution.

There was one exception: *AberMUD*, so named because it originated at the University of Wales, Aberystwyth. Written by Alan Cox[9] in 1987, it wasn't particularly noteworthy in terms of its design (it relied rather heavily on combat), but it was fun to play and newbies liked it. The first version was coded in B (a stripped-down BCPL); after a year, though, Cox ported it to C. This was to prove a defining moment in virtual world history: being written in C meant that *AberMUD* could run under Unix – an operating system adopted by many Computer Science departments across the globe, connected by what was coming to be known as "the Internet".

# The Third Age: 1989-1995

*AberMUD* rampaged across university Computer Science departments, with local copies appearing on thousands of machines. It was the first virtual world most players had seen, and they wanted more. Duly inspired or frustrated by *AberMUD*, some of them began writing their own such virtual worlds, the most important results being *TinyMUD*, *LPMUD* and *DikuMUD*. Their differing views on what virtual worlds were "about" led to a schism that persists to this day.

*TinyMUD* was written by Jim Aspnes at Carnegie Mellon University in 1989. It had two "parent" worlds: *AberMUD* and a world called *Monster*. *Monster* had been developed in 1988 by Rich Skrenta of Northwestern University without his having any awareness of the existence of other virtual worlds. Its main difference from the *MUD1* tree was that it allowed players to create new content from within the virtual world itself; this had been the standard in *MUD* version 2, but had been dropped in the switch to version 3 and hadn't been picked up by any of its descendents.

*TinyMUD* was a deliberate de-gaming of *AberMUD*. Player activity centred on creating locations and populating them with objects; there was no formal gameplay whatsoever. This gave the virtual world a decidedly more communal feel. Although not quite the first such "social" virtual world (it was marginally predated by a *Shades* descendent, *Void* (Lindus, 1989)), it is the progenitor from which almost all subsequent ones descend.

*TinyMUD* itself lasted barely a year. Ultimately, its problem was that there was little substance to it. You could build things, but you couldn't make what you built do a lot. In 1990, Stephen White wrote *TinyMUCK* to extend the basic functionality[10]. He swiftly followed this up with *MOO* ("MUD, Object-Oriented"), which featured a fully-functioning scripting language for object creation. *MOO* subsequently gave birth to *LambdaMOO* (Curtis, 1990), which became *the* social virtual world of the 1990s. *TinyMUCK*, meanwhile, sprouted Larry Foard's 1990 *TinyMUSH*[11]. This introduced several innovative features, such as event triggering and programmable non-player characters.

From *TinyMUD*, then, there are three main sub-branches, or *codebases*: MOOs, which have found a niche in education; MUSHes, which are popular among narrative-driven role-players; MUCKs, which are used mainly for social interaction. None of these have any meaningful game-like component, and their developers tend to distance them from the other direct descendents of *AberMUD*, which do.

*LPMUD* took its name from its author, Lars Pensjö, of the University of Gothenburg, Sweden. Pensjö had played *AberMUD* and *TinyMUD*, and wanted the gameplay of the former with the flexibility of the latter (in part, because he felt that other people were better at game design than he[12]). To this end, he devised a user-

friendly, object-oriented language called LPC, for creating game worlds. Because of LPC's expressive power, every LPMUD that was made was individual.

This is not something that could be said of *DikuMUD*. Created in 1990 by a group of friends[13] at the Department of Computer Science at the University of Copenhagen[14], Denmark, it took the opposite approach to *TinyMUD* and focused on intensifying the game aspects of *AberMUD*, drawing heavily on concepts from *Advanced Dungeons and Dragons* such as character classes. The developers also eschewed the *TinyMUD* and *LPMUD* trend towards empowering players, hard-coding everything in C. This might have been a bad move, but they coded it *very* well. The gameplay of *DikuMUD* was deep and compelling, and its "runs out of the box" ease of installation ensured that lots of people got to experience it. Players of social worlds and the cerebral *LPMUD*s were speedily outnumbered by devotees of *DikuMUD* and its numerous progeny.

The Third Age of virtual world design can thus be characterised as a period of expansion. Indeed, a 1993 study of Internet traffic showed that 10% of all the bits on the NSFnet backbone belonged to MUDs. However, with expansion came division: the tensions between people who played virtual worlds for social reasons and those who played for the gameplay came to a head, leading to a social/game world split that's still with us today.

Although the Third Age was dominated by virtual worlds played for free on university-run computers, professional virtual world developers had not been idle. They had the better products, but attracting new players was proving difficult.

If only they could find a way to reach a larger audience…

# The Fourth Age: 1995-1997

The first commercial virtual world was probably *Sceptre of Goth*.

Around the same time that Roy Trubshaw wrote *MUD*, Alan Klietz wrote a game called *Milieu* on a computer operated by the Minnesota Educational Computer Consortium. It was inspired mainly by *Colossal Cave Adventure* and *Dungeons and Dragons*, and during its development acquired the necessary features that would today categorise it as a MUD (although it was developed completely independently of *MUD*). In 1983, Klietz ported it to an IBM XT, renaming it *Sceptre of Goth*. He formed a company, GamBit, to franchise the game to others, and it launched successfully as a commercial product in 6 US cities.

GamBit sold its software to a company called InterPlay, which promptly (and for unrelated reasons) went bankrupt. *Sceptre of Goth* disappeared with it. It was not without influence, however: it inspired *GemStone*, of which more anon.

Although early virtual worlds flowered in the UK, the cost of accessing them (over telephone lines) was prohibitive. In contrast, phone calls in the USA cost pretty well nothing, so large online service providers such as CompuServe emerged there. Games were actually very profitable for CompuServe, but were seldom promoted for fear of putting off business users and parents.

The first online service to embrace games was GEnie, set up in 1985 by Bill Louden (the former head of games at CompuServe). The strategy had mixed results: by the early 1990s games accounted for 40% of GEnie's revenue[15], but it had far fewer subscribers than CompuServe[16] because business users and parents were indeed put off by a games-first attitude…

GEnie's Games Product Manager at the time was Jessica Mulligan, who had arrived from another 1985 start-up, QuantumLink (later to become AOL).

QuantumLink featured a popular early graphical chat-oriented world, *Habitat* (Morningstar and Farmer, 1985), and Mulligan had recommended acquiring the *Advanced Dungeons and Dragons* licence for an online game (eventually realised as *NeverWinter Nights*[17] (Daglow and Mataga, 1991)). At GEnie, she oversaw a product line that came to include some of the finest online games of the day. 1990 saw the introduction of old UK favourite, *Federation II,* followed by two important newcomers: *GemStone ][* and *Dragon's Gate*.

David Whatley's original *GemStone* was a hard-coded prototype which would not readily run on GEnie's mainframes. Whatley formed a company, Simutronics, to develop *GemStone ][*, hiring (among others) five ex-*Sceptre of Goth* people to create content for its new game engine. Following *Gemstone ][*'s launch, Simutronics started on *GemStone III*, which was even better suited to GEnie's system.

Adventures Unlimited Software, Inc. ("AUSI") had been set up five years earlier by programmer Mark Jacobs to run a virtual world called *Aradath* that he had created (independently of *MUD*). *Aradath* had adopted the (at the time) innovative approach of charging users a flat fee to play, rather than using per-hour rates. One of Simutronics' lead programmers, Darrin Hyrup, was sufficiently impressed by AUSI's potential that he signed up with Jacobs to write *Dragon's Gate*. The result was a compelling, well-engineered game world.

In 1993, the online market was dominated by five US providers: CompuServe, Prodigy, AOL, Delphi and GEnie. Smaller, sector-specific services existed, which for games included MPG-Net and The Sierra Network[18]. Those commercial virtual world developers who could get their games on one or more of these systems were in reasonable shape; times were lean for those that couldn't.

Then came the roller-coaster ride.

With the arrival of the World Wide Web in 1994, people became excited by "online". They flocked to those companies that could offer Internet access. Some service providers, led by AOL, readily accepted their business; others, most notably CompuServe, remained aloof (much to their cost). By 1995, hordes of Internet newbies were signed up to AOL, looking for interesting content. Naturally, a good many of them wanted to play games.

So began the short but remarkable Fourth Age of virtual worlds. With *NeverWinter Nights* only able to accommodate 500 simultaneous users, AOL swooped on *GemStone III*, *Dragon's Gate* and *Federation II*, offering them a fair royalty on its hourly fees. The result was that developers found themselves taking in over a million dollars a month. It was a tremendous time to be in the industry *if* your game was on AOL; if it wasn't, it was somewhat frustrating.

It couldn't last. When small bulletin-board systems began to offer Internet access for a flat, monthly fee, AOL had to follow suit. In December, 1996, it changed its $2.95 hourly charge to $19.99 per month all-in, and by the middle of 1997 the money machine had stopped.

Thus, the Fourth Age of virtual worlds ended. Despite its short duration, though, it had made a significant point: virtual worlds could be lucrative. The wider games industry began to take notice: although handling 3,000 players at once for a flat monthly fee was not profitable, suppose some way of attracting, say, ten times this number could be found,? Yet would that many people really play a text game in the late 1990s?

Fortunately, virtual worlds don't have to be textual.

# The Fifth Age: 1995-Present

Graphical virtual worlds were not a new idea.

PLATO ("Programmed Logic for Automated Teaching Operation") started life as an innovative computer-aided learning system at the University of Illinois in 1960. The fourth version, which began operation in 1972, featured an integrated graphics-capable plasma display and excellent network connectivity; it was way ahead of its time, and trail-blazed many ideas which have since become mainstream. Some of the games developed on it set out principles which would greatly influence the design of later games on other systems.

Naturally, it had virtual worlds.

It's actually quite difficult to pin down which of several PLATO IV games was its first virtual world; even PLATO enthusiasts seem unable to agree. It's generally recognised that *Avatar*[19] (Maggs *et al*, 1979) probably qualifies: it features high degrees of player interaction, and contains all of the features expected of a virtual world. Its only failing is in its poor persistence, but then *MUD1* was only marginally better in that regard. However, *Avatar* was created to beat *Oubliette* (Schwaiger *et al*, 1977). Was *Oubliette* a virtual world? Well, its player interaction was extremely limited and it was not truly persistent, but does that completely rule it out? *Oubliette* in turn drew from *Mines of Moria* (Miller *et al*, 1976), which had even less interaction, and *Mines of Moria* was itself ultimately inspired by *Orthanc* (Resch *et al*, 1973). *Orthanc* was not a shared *world*, but it allowed shared *communication* between players across games. Does that make it a virtual world?

In the end, it's moot: although PLATO left a great legacy in many areas of hardware, software, interface and game design, its influence on the development of virtual worlds is practically zero[20]. There's no audit trail from today's virtual worlds back to those of PLATO. Golf was invented in China.

This is true of several other graphical virtual worlds. For example, although *Habitat* was a fair success, it didn't inspire any successful imitators; its main influence has come through the authors' must-read post-mortem (Morningstar and Farmer, 1991).

One graphical virtual world from which others did flow was *Islands of Kesmai*, written by Kelton Flinn and John Taylor in 1981 at the University of Virginia. It was an early signing by Bill Louden at CompuServe[21], where it went live in December 1985. The term "graphics" is used fairly loosely here, as *IOK* used groups of ASCII characters to display its virtual world: [ ] represented a wall, for example. These groups were arranged as a flat tessellation of squares to present a bird's eye view. Later game worlds, particularly AOL's *NeverWinter Nights* and MPG-net's *Kingdom of Drakkar* (Lineberger, 1992), copied the idea but replaced the ASCII with 2D images.

Despite these pictorial advances, today's Fifth Age graphical worlds owe very little to *NWN* or *KoD*: their roots lie almost entirely in the Third Age with DikuMUDs. The idea of graphical MUDs was an old and obvious one – it wasn't as if anyone had to see *IOK* to get the idea of them – and although their interfaces are different, the engineering behind a graphical world is much the same as that behind a textual one. There were thousands of people who had experience playing, developing and designing textual worlds, as opposed to a few dozen at most who had worked on graphical worlds; therefore, when companies were looking for people to hire to work on new graphical worlds, they found a huge supply of talented people from a textual-world background and almost none from a graphical-world background. As a result,

today's graphical worlds are not the descendents of earlier graphical worlds, but of textual worlds. Furthermore, this leap from text to graphics happened the same way twice: in the Far East and in the West.

MUDs had arrived in Oriental universities in the early 1990s, and rapidly gained popularity among students in China, Taiwan and South Korea. As elsewhere, the players were keen to write their own games, and some went on to do so.

The South Korean government's decision to promote investment in Internet infrastructure prompted two companies to develop graphical virtual worlds. Perhaps surprisingly, both worlds were designed by the same person, Jake Song[22]. Song had written a MUD called *Baramue Nara* while a student at the Korea Advanced Institute of Science and Technology in 1994. His first graphical world was Nexon's *The Kingdom of the Winds*, launched in 1996; NCSoft's *Lineage* followed in 1997. Both games were enormous successes: *KotW* picked up a million subscribers, and *Lineage*, at its peak, around four times as many. Both games opted for a third-person, isometric viewpoint which has the same tessellated-squares base of the *IOK* derivatives but places the camera at an angle so as to give the impression of a 3D landscape (technically, this is known as a *2½D* approach – it looks 3D but you can't have caves or bridges).

Meanwhile, back in the West, there were four companies working on (what were at the time called) graphical MUDs. Each had a different approach, and, as they all knew about each other, there was something of a race to become the "first" such game.

The winner was *Meridian 59*, designed by Mike Sellers and Damion Schubert, which went live in 1996[23]. It was also 2½D, but presented a first-person viewpoint with proper perspective. Unfortunately, although its design was sound, it launched prematurely: it didn't have enough content; its graphics didn't compare well with those of single-player games of the era; too few potential players had Internet connections[24]; its publisher (3DO) didn't market it well. If it hadn't tried to be first, it could have become the paradigm; instead, it became the pioneer.

Second out, in 1997, was *Ultima Online*, and it is with this game that the tide really turned. Its lead designer, Raph Koster, had co-created the very much admired *LegendMUD*[25] (Delashmit, Koster and Koster, 1994), and he set out to build something which was a *world* rather than a *game*. With the name and setting of the much-loved *Ultima* (Garriott, 1980) series[26] behind it, the *UO* team believed they may be able to attract large numbers of players – perhaps, in their dreams, as many as 40,000! When they hit 100,000 within a year of launch, suddenly what had been regarded as something of a backwater by mainstream games companies was treated seriously. Those 100,000 players were paying $9.95 a month *having already bought the game*, and none of that money was going to retailers. *UO* was no longer simply an online role-playing game, it was a *massively-multiplayer online role-playing game* – an MMORPG.

*UO* was the breakthrough world, but it fell victim to its own success. The flood of players who swept through it rapidly overwhelmed the content and caused severe technical difficulties[27]. There was pressure to deal with problems expediently, papering over cracks that should really have been replastered. Even so, *UO* was to peak at around 250,000 players during the period 2001-2003, and today still has numbers that most start-ups would be overjoyed to obtain.

*Ultima Online* had an isometric viewpoint, like *Lineage*, so again was 2½D. The first fully 3D virtual world was *EverQuest* (McQuaid, Clover and Trost, 1999).

*EverQuest* was basically a DikuMUD with a graphical front-end bolted on[28]. Its look was similar but superior to *M59*'s, filling more of the screen and so increasing the sense of immersion engendered. It launched just as *UO* was getting some bad press, and was publicised very well. Its DikuMUD heritage gave it compelling gameplay, and within 6 months it had overtaken *UO* as the #1 virtual world in the West. In its 2001-2004 heyday, its 425,000+ player base was regarded with envy by every other developer, and over a hundred new worlds were announced that aimed to take its crown (mainly by mimicking it). In terms of today's graphical worlds, it is *EQ* rather than *UO* or *M59* that most deserves to be called the progenitor.

The fourth major virtual world to go live was *Asheron's Call* (Ragaini, 1999), which came out 9 months after *EQ* but was itself a year late. Also fully 3D, had it beaten EQ to the punch it could have done exceptionally well; as it was, it barely managed to break the 100,000 benchmark in *EQ*'s wake.

It was almost two years before the next notable game world appeared – *Anarchy Online* (Godager, 2001). *AO* was Europe's first foray into the marketplace, being a joint Norwegian/Irish venture with a Science Fiction premise. Unfortunately, its launch was a disaster from which it never fully recovered.

The same could not be said of *Dark Age of Camelot*, which materialised four months later. The reason was experience: *DAoC* was developed by Mythic Entertainment, a reinvention of AUSI – the developers of *Dragon's Gate*[29]. Its well-prepared, smooth launch[30] remains to this day a model of exactly how to do things right, and Mark Jacobs' carefully-targeted design ensured that it picked up the players to match. Within a year it had 200,000 subscribers, supplanting *AC* in the "big three" (with *EQ* and *UO*)[31]. These virtual worlds remained pre-eminent until 2004.

With many upcoming virtual worlds in development, promising better graphics and more advanced gameplay, the leading developers decided to bring out new products themselves. These came in two basic flavours: existing virtual worlds with the number 2 after their name; new virtual worlds based on popular franchises.

The first two franchised virtual worlds to gain a head of publicity were *The Sims Online* and *Star Wars Galaxies*. *The Sims* (Wright, 2000) is a hugely successful series of single-player games, and it was natural that executives would consider it a prime candidate for making into a virtual world. Virtual world designers, however, were perplexed: *The Sims* is, in essence, a virtual dollhouse; people play *with* dolls, not *as* them. Sure enough, it shot up to over 100,000 players within a year of its December 2002 launch, but then shed them almost as rapidly to reach a plateau of around 30,000.

*Star Wars Galaxies* had an excellent pedigree: a much-loved movie series and, in Raph Koster, a virtual world designer of proven ability. It was regarded as a serious contender to become the first Western virtual world to rack up a million players – and had it launched to Koster's design it could indeed have done so. However, it ran into production delays, and went live in June 2003 missing several important features. Although it reached an impressive 300,000 players almost immediately, and maintained that figure for nearly 18 months, it then slid badly as the promised content still failed to appear. The "Combat Upgrade" of April 2005 and the "New Game Enhancements" that followed in December changed *SWG*'s character entirely, losing it tens of thousands of players (although successfully stabilising around those who remained).

Other new virtual worlds set in existing imaginary universes have fared even less well than *SWG*. *The Matrix Online* (Ragaini, 2005), despite being designed by Toby Ragaini (who was also responsible for *Asheron's Call*), didn't even reach

50,000 subscribers after launching in March 2005. Only Turbine Inc.'s *The Lord of the Rings Online* can be regarded as a success – but it followed at least three failed attempts by other companies to fit the licence.

Most of the "add a 2" worlds were not great triumphs either. Electronic Arts canned several follow-ups to *Ultima Online*, one after the other, before any were even launched. *Asheron's Call 2* removed all the gameplay elements that players complained about and was left with a boring, empty husk.

There were attempts by console manufacturers to crack the virtual world market, beginning with SEGA's 2000 offering, *Phantasy Star Online* (Sonic Team, 2000) for the Dreamcast, but the lack of a keyboard as standard with most consoles undermined this effort. To date, the only real success has been Sony's 2002 *Final Fantasy XI* (Square Co., 2002) for the Playstation 2, helped largely by its additional provision of a PC client.

In practice, the cost of creating graphical worlds was so high that most of the new games announced never made it to beta-testing. Some, however, did. Furthermore, the ones that survived tended not to be the *EverQuest* clones that comprised the bulk of the announcements. Of particular note are the following, all of which went live in 2003: *A Tale in the Desert* (Tepper, 2003), *Toontown* (Walt Disney Imagineering, 2003), *Yohoho! Puzzle Pirates* (James, 2003) [32], *Project Entropia* (Timkrans *et al*, 2003) and *EVE Online* (Emilsson, 2003).

With dozens of new virtual worlds now appearing every year both in the West and in the Far East, it would be fruitless to list them all here[33]. To bring us up to date, there are two, however, that merit special mention: *Second Life* and *World of Warcraft*.

*Second Life* is not a game, because it has no embedded gameplay. It's a social world, the latter-day successor to *LambdaMOO*. Developed by Linden Labs in 2003, all its content is created by its players, who buy and sell their wares for "Linden dollars" – an internal currency that can be purchased with real currency. Its player-empowerment innovations are ground-breaking, and it leads the way in establishing virtual worlds' relationship to society at large. It is the automatic first point of call for non-gamer journalists and academics who want to find out more about virtual worlds, and its precedents are marking out the real/virtual boundary in ways that game worlds are reluctant to consider. There are other free-to-play social worlds that have a larger user base (in particular *Habbo Hotel*, which has over 4 million unique visitors per month[34] compared to *Second Life*'s 1 million[35]), however it is *Second Life* that is the more likely to affect real-world social policy.

By all rights, the other virtual world I should be talking about is *EverQuest II* (Cao, 2004). Unlike its fellow sequels, *EQ2* did very well: it had a superb launch, was critically acclaimed by players of *EverQuest*, and had over 300,000 players within 3 months. It had a solid design, proven gameplay, quality graphics, stable hardware, experienced customer service representatives, excellent publicity *and* the *EverQuest* name. It couldn't fail, and indeed it didn't: by all previous metrics, it was a success. So why does it now barely rate a mention ?

The answer is that a few weeks after *EQ2* launched, *World of Warcraft* arrived. *WoW* has some 11 million players at the time of writing, and those numbers are still rising.

There are several factors that contributed to *WoW*'s success – the *Warcraft* name, its huge development budget[36] – but what it really comes down to is *craftsmanship* and *design*. The developers, Blizzard Entertainment, had some experience of running a large-scale online game in *Diablo II* (Hedlund, 2000), the

success of which had been marred by their making a number of classic mistakes. They learned from these, put all the necessary infrastructure in place, and polished the software until it shone. It was unquestionably going to be a quality product in terms of its implementation.

*WoW*'s designers were Rob Pardo, Jeffrey Kaplan and Tom Chilton. Pardo and Kaplan had been heavy players of *EverQuest*, and Chilton was lead designer of the fifth *Ultima Online* expansion, *Age of Shadows*. They gave *WoW* a more whimsical look than its competitors (which were heading towards photorealism) and made it easy to play solo (instead of always in groups). There were many reasons to play and few reasons not to, and while *WoW*'s design elements are not all particularly original, the way they are fitted together is done *very* cleverly. Crucially, the different forms of gameplay that coexist alongside each other make *WoW* just as popular in the Far East as in the West: around half its players live in China (Scheisel, 2006).

The state of play at the moment is:

- *World of Warcraft* rules virtual worlds as games.
- *Second Life* has the most influence over policy-makers and opinion-formers, at least in the West.
- Large populations of players frequent social spaces that may be regarded as virtual worlds, such as *Habbo Hotel*[37], *Active Worlds*[38]and *Virtual Magic Kingdom*[39].
- Browser-situated games, which can be played through office or school firewalls, are an emerging category. The leader here is Java-based *RuneScape* (Gower, 2002), which has 800k paying customers and over 9 million playing for free (Radd, 2006).
- There is a renaissance of virtual world design, with developers seeking new angles and genres rather than trying to compete on the centre ground. They're going with micropayment business models, rather than subscriptions.
- Games that use licensed IP still have potential.
- The Far East, particularly South Korea, is way ahead of the West when it comes to integrating virtual worlds into mainstream culture.

So where will virtual worlds go next?

# Conclusion

We've been here before.

Graphical virtual worlds have pretty well followed the same historical path as their textual predecessors. We're currently at about 1992. We had an original paradigm which gave rise to three or four early successes that ruled the roost for a period, a sudden flourishing of different designs, and a split between social and game-like worlds. The current market is dominated by a handful of large operators that make it increasingly difficult for others to compete for players.

If graphical worlds follow the textual precedent, we can therefore expect to see the following:

- The introduction of some equivalent of codebases – free or inexpensive game engines that allow the creation of new virtual worlds without major programming effort. This is already starting to happen with projects such as *Multiverse*[40], *Realmcrafter*[41] and *Worldforge*[42].
- Serious use of virtual worlds as tools for education and training.

- The proliferation of virtual worlds created by and for groups of friends, perhaps even down to the granularity of a personal *Facebook* page. *Metaplace*[43] looks to be the model here.
- The continued existence of large-scale commercial worlds, albeit with less of a grip on more experienced players.
- Increased understanding of design issues.
- Some major paradigm-shift which will start the cycle all over again.

Virtual worlds have been invented on at least six separate occasions: *MUD*, *Sceptre of Goth*, *Avatar*, *Islands of Kesmai*, *Aradath* and *Monster*. They were always going to happen, and they were always going to go graphical. Today's extravaganzas are the latest in what promises to be a long chain of developments. Although some of what we can expect in the next decade is foreseeable, much is not. Will there be some kind of world wide web of worlds, or will society move on? Is *World of Warcraft* the zenith of large-population worlds, or will something appear that is to *WoW* as *WoW* is to the once-dominant *EQ*? Will the real world welcome the virtual, or seek to weaken them through regulation?

Whatever happens, we can be sure of one thing: the history of virtual worlds does not end here.

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[1] Even though it was banned there by the parliament of James II in 1457. They banned football (soccer) at the same time.

[2] Conflict of interests warning: this is me.

[3] My oldest extant program listings for *MUD*, along with original design artefacts, are deposited in the archives of Stanford University Libraries and Academic Information Resources. They asked first. http://library.stanford.edu/.

[4] He acknowledged this in *MUD*'s very name: the *D*, while chosen primarily to complete a memorable acronym, formally stands for *Dungeon* (a Fortran port of *Zork* that Trubshaw had encountered).

[5] This "personal freedom allows people to do good" world view was common among those who worked with computers at the time, probably because only those holding to that particular set of values could function as programmers in those experimental, tool-free days (Levy, 1984).

[6] The best-known of these were *ROCK* (Fox, 1983) and *MIST* (Barham,*et al*, 1987).

[7] As part of a joint project with the Post Office (now British Telecom), Essex University had an X.25 connection to the ARPAnet, the network which later evolved into the Internet.

[8] There was no *Federation I*: the game began life in 1985 as a CompuNet project called *Multi-User Galaxy Game*, in an attempt to create a home-grown alternative to *MUD1*. It is notable for being the first virtual world to use a Science Fiction setting, although few (if any) other SF virtual worlds directly descend from it. Its de-emphasising of combat did influence other early virtual worlds, however.

[9] He is also well-known for his pioneering work on the Linux operating system, in 2005 receiving a *LinuxWorld* lifetime achievement award in recognition of his efforts.
[10] *TinyMUCK* came with its own language, TinyMUF ("Multi-User Forth") embedded within.
[11] As with the MUCK in TinyMUCK, the MUSH in TinyMUSH wasn't intended to be an acronym.
[12] "I didn't think I would be able to design a good adventure. By allowing wizards coding rights, I thought others could help me with this." Lars Pensjö, quoted in (Reese, 1996).
[13] Katja Nyboe, Tom Madsen, Hans Henrik Staerfeldt, Michael Seifert and Sebastian Hammer.
[14] Datalogisk Institutved Københavns Universitet.
[15] The usual figure quoted is 70%, but according to Neil Harris, who was Director, Marketing at GEnie, it peaked at 40%.
[16] CompuServe had well over a million around this time; GEnie claimed 400,000 but the reality was somewhere between 100,000 and 125,000.
[17] Note that although this shares the *Forgotten Realms* setting of the 2002 BioWare game of the same name, there's no formal connection between the two.
[18] Renamed the *ImagiNation Network* in 1994.
[19] *Avatar* was the most successful ever PLATO game, accounting for 6% of all PLATO usage during its tenure.
[20] It would be completely zero, but a few influential people in the virtual world industry did cut their teeth on PLATO. In particular, producer Gordon Walton, lawyer Andy Zaffron and designer David Shapiro ("Dr Cat") played a lot of *Avatar*.
[21] It was also offered to The Source, but was not received favourably even though it already ran on the same type of mainframe (Prime Computer) it used.
[22] Perhaps unsurprisingly, he's now regarded as one of Korea's most esteemed game designers.
[23] Indeed, it went live exactly ten years ago to the day that I'm writing this: 27th September, 1996.
[24] It garnered around 12,000 players, with each instantiation of the world capable of holding around 250 players – about the same as for contemporary textual worlds.
[25] It was an offshoot of the 1992 *World of Carnage* (where the Koster met *Meridian 59*'s Damion Schubert), and although ultimately derived from *DikuMUD* was – and remains – an incredibly detailed fantasy world, with deep, hand-crafted quests. Delashmit, its programmer, left in 1995 to become lead programmer for *Ultima Online*, and it was he who recommended the Kosters to Origin Systems (*UO*'s publisher).
[26] The Ultima series of role-playing games was famed for combining open-ended gameplay with a strong narrative. For a list of the full series, see http://www.mobygames.com/game-group/ultima-series .
[27] At one point, the Internet bandwidth used by *UO* was greater than that used by New York.
[28] So close are the similarities that *EverQuest*'s programmers were obliged to sign a sworn statement to confirm that they didn't use any *DikuMUD* code in the game. http://www.dikumud.com/img/server.gif .
[29] This is why I said Fifth-Age virtual worlds were *almost* entirely descended from Third-Age worlds. Mythic products *DAoC* and *Warhammer: Age of Reckoning* came from a Fourth-Age world, and are currently the only major MMORPGs not to be a direct descendent of *MUD1* (although Simutronics' *Hero's Journey*, a derivative of *Gemstone IV*, will shortly join them).
[30] A launch is said to be smooth if: the players can buy and install the software without problem; they can access the servers without problem; there are neither too many nor too few servers available; the servers don't crash; the clients don't crash; there are no horrendous bugs that render the world unplayable. All this is well known to virtual world developers, yet products are still launched which manage to fail in every one of these respects…
[31] Alternatively, for those with a soft spot for *AC*, expanding the "big three" to the "big four".
[32] Daniel James has long experience in virtual world design: he was a player of *MUD1* (for which he wrote the wizards' guide in 1984), and was one of the designers of *Avalon* in 1989.
[33] For a reasonable list, see http://www.mmorpg.com/gamelist.cfm/gameId/0 .
[34] http://www.sulake.com/pressroom_releases_01122005.html .
[35] Daily-updated figures are shown at https://secondlife.com/currency/economy.php (free registration required).
[36] The amount spent to develop *World of Warcraft* is variously quoted at between $30m and $60m, both with and without the promotional costs.
[37] http://www.habbohotel.com/habbo/en/ .
[38] http://www.activeworlds.com/ .
[39] http://vmk.disney.go.com/vmk/en_US/index?name=VMKHomePage .

[40] http://www.multiverse.net/ .
[41] http://www.realmcrafter.com/ .
[42] http://www.worldforge.org/ .
[43] https://www.metaplace.com/ .