



# Virtual Worlds – What to Expect in 2009

Presented to VWF08 Delegates

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Publication Date: September 2008

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Steve Prentice

Business leaders remain skeptical about virtual worlds but they offer huge potential for enhancing interaction, collaboration and innovation in the enterprise, as well as providing a highly immersive and engaging communications channel for enterprises.

### Overview

It can be difficult to convince business leaders that investing in virtual worlds is worthwhile or that such investments can deliver measurable benefits. They frequently underestimate the size and scope of the technology. Here we describe the current state of the technology and market, examine current and future trends and opportunities for enterprise use, including a three-step incremental approach to deployment.

### Key Findings

- The growing availability of cost-effective, virtual-world technology to simulate interactions in the real world has re-emphasized their value. All enterprises should investigate applicable uses of this technology.
- The growing ease with which real-world geospatial data can be imported into the virtual environment makes creating realistic "mirror worlds" a viable option for training and familiarization.
- Virtual worlds provide a powerful, collaborative environment, but tight controls are required to minimize the risk of failure through overenthusiasm and too-rapid expansion.
- Once the benefits have been proved, virtual worlds will enhance casual social interactions inside the distributed enterprise, which can lead to innovation and produce competitive advantage.
- Best practice is to avoid large and unbounded projects in the first instance, start small to prove the medium, and gain experience to ensure the likelihood of success and a demonstrable return on investment to a potentially cynical and unknowledgeable management.

## Recommendations

- Virtual worlds may be "cool," but projects still need careful planning to maximize the potential for success. Avoid the hype and don't try to move ahead too quickly.
- Keep the focus internal — the benefits of externally focused virtual world projects are more difficult to justify and measure.
- Investigate opportunities to use virtual worlds and simulations for in-house training and education/onboarding. Training already has a budget — use it as the entry point.
- Proceed toward more-general deployment only when success has been demonstrated on more-constrained projects and the organization has developed an appetite for virtual worlds.
- Consider the use of online gaming and simulation environments to explore complex social interactions and study individual behavioral responses to alternate strategies.
- Do not be tempted to embark on large and extensive projects until experience has been gained and management acceptance of the medium has been earned through successful pilot deployments.

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## Strategic Planning Assumption(s)

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By YE 2011, 80 percent of heavy internet users will have a presence in one or more virtual worlds

## Analysis

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### 1.0 The Current Position

Virtual Worlds have been around for a long time, fantasy games like Dungeons and Dragons existed in our fertile imagination long before they found a new audience through teletype access to “Colossal Cave” with its impenetrable maze of twisty little passages all the same, or maybe they were all different! Research scientists programmed their super-computers to simulate the real world events they could not investigate otherwise and a generation of armchair pilots learned to fly on their IBM PC.

But the modern era of virtual worlds really exploded into the global consciousness in May 2006 when Anshe Chung (the Second Life avatar of Ailin Graef) made the front cover of Business Week. Second Life (operated by Linden Lab) had already been in operation for several years and the MMORPG sector was well developed, with millions of users playing “Ultima Online”, “Everquest”, “World of Warcraft” and other fantasy games. As people realized that it was possible to make money inside virtual worlds they started a painful transition from being a personal experience to something quite different – as investors, entrepreneurs and enterprises sought to find the next wave to ride and expunge the painful memories of the dot.com bust.

### 1.1 Defining Virtual Worlds

As a precursor to understanding the driving forces, the market segmentation, success factors, problems and issues with virtual worlds it is necessary to bound the problem and define what we mean by a “virtual world”. Whilst many will seek to build a definition based around technical capabilities, form and function it is more useful in the broader discussion to consider the function, rather than functionality. Function defines usage. Function defines direction. Function is defined by usage and users, not by developers. Functionality can be misleading. Unnecessary functionality will simply be ignored, unimplemented functionality will be developed or work-arounds created.

Virtual worlds are not about technology, or “physics” as I think of it (thereby including elements such as lighting, gravity, object interactions and so on). They are primarily and fundamentally about people. Virtual worlds are about creating an environment in which people interact. In the early days of Microsoft Flight Simulator, interaction was fairly deterministic, the same actions would invoke the same responses every time you played (after all the flight envelope of an aircraft doesn’t change). With increasing computing power, affordable bandwidth and the global internet community we entered a world where interactions become non-deterministic, since behind all those other avatars were other people doing unpredictable things. The primary requirements are the concepts of presence and persistence. We interact with other individuals (via our respective avatars) in real time – they are in a concurrent space at the same time as us – and changes made will persist after we leave the environment (although others may change things whilst we are gone).

Purists will argue the requirement for some representation of the spatial environment, but how real does that have to be? The human imagination can, and does, “fill in the blanks”. We don’t need expansive photo-realistic spaces to create a virtual world and some of the most successful

(in terms of usage) virtual worlds have retained the simplistic isometric 2.5D representation without apparent diminution of their attraction.

Taking this a stage further, if virtual worlds are primarily about interaction between individuals (and the formation and evolution of communities), then can we consider the hugely successful two dimensional social networking sites such as Facebook, MySpace, CyWorld or Bebo (amongst others) to be virtual worlds. A majority would probably say no today, but as we see 3 dimensional virtual spaces being added to Facebook and the like through things like Vivaty and many others still in stealth mode, this will become an increasingly difficult distinction to draw.

Once the virtual environment becomes visible, whether in isometric form such as Habbo Hotel, a simple personal space or room such as Google's Lively or IMVU, or entire continents such as are to be found in Second Life then there is little dispute.

But can we ignore the burgeoning numbers of MMORPGs, such as World of Warcraft, Eve Online, Entropia Universe and many others? These fulfill the essential criteria of presence, persistence and interaction with other individuals via their avatars. The inclusion of gameplay elements, objectives and levels does not distract from these environments and, in reality, is at the core of their huge and ongoing success.

So whilst, from an enterprise usage perspective, it is the middle ground of virtual worlds that is of primary interest, an appreciation and careful observance of the peripheral segments is important to avoid being taken by surprise by future trends and developments.

So the essential elements of a virtual world are:

- 1 The concept of presence in a space
- 2 The notion of interaction in real time with other individuals
- 3 The idea of persistence, environment and objects remain whether we are present or not
- 4 The representation of our online persona via an avatar

## **2.0 Market Sizes and Segmentation**

Defining things is a very human characteristic, usually followed by measuring them. "How big is the virtual universe?". "How many residents are there?". "How many worlds are there?". "How fast is it growing?". "Where will we be in a few years time?". These are common questions, to which there are many answers, but the real truth is that no-one really knows! This is an emerging market, still in its infancy. New virtual worlds are being launched every week. Users move from one world to another seeking their "ideal". Many users have multiple accounts (in order to support multiple personae) in a single world, and accounts in many different virtual worlds. Many, probably the majority, of user accounts are inactive and forgotten as users experiment and move on – but such behaviour and the predominant "free to download, pay for premium features" model adopted by the majority of operators makes accurate statistics all but impossible at this time.

### **2.1 Numbers**

"How many virtual world residents are there?" is one of the most frequently asked questions, one of the most difficult to answer accurately and, probably, one of the least valuable of all numbers.

There is a tendency to collect those numbers that are the easiest, and recording the number of new account registrations is easy. However, with the high numbers of users registering, experimenting and then leaving the virtual world, the number of registrations is very misleading. Linden Lab (the operators of Second Life) do actually report both the number of new account registrations and the number of “active users” – those people who have been “in-world” in the last 30 days. This number is a more realistic guide to the size of the user base and shows a ratio of approximately 12 to 1 between registrations and active users. Whilst most other operators do not report such numbers, the “rule of thumb” ratio of 10 or 12 to 1 has not (to this date) been disputed by them and is substantiated by the (few) other sets of similar figures that are released. Over recent months as the hype surrounding virtual worlds has declined, this ratio appears to have worsened. Figures from Linden Lab (as of September 16<sup>th</sup>, 2008) show a ratio of 17.4:1 between total accounts and residents logged in during the last 30 days. There is some indication that the ratio in worlds targeted at the younger age-groups may be slightly lower (perhaps 8 to 1) – kids have a clearer idea of what they want and the worlds are closely focused on specific interest groups which results in lower dropouts.

With the “free to register” approach there is no financial barrier to entry for new users. The numbers of premium users in Second Life (those who pay a monthly subscription) is reported by Linden as 86,457 (for July 2008), down from the all time high of 94,607 in June 2007. On this basis approximately 10% of active users (and significantly less than 1% of total registrations) are prepared to pay a monthly subscription. However, it should be noted that the requirement to pay a monthly subscription is not a pre-requisite of the ability and willingness to spend money “inworld”.

Rather than focusing on simple figures such as number of accounts or even active users or premium accounts, it is more useful to pose the questions “Who is asking for the number?” and “What decision are they attempting to make?”. Raw data is interesting in an academic sense, but knowing the context, target and purpose allows us to focus more accurately on numbers that actually serve their intended purpose. For example, if attempting to evaluate the value of a virtual world as a platform to reach a specific target audience (a common aspiration of enterprises), then numbers such as “Number of Unique Users per month”, “Number of Unique Visits per month”, “Average duration of each visit” would be more directly valuable.

### **2.1.1 Virtual World Population**

With new virtual worlds being announced almost every week, and many difficult to substantiate claims of users keeping track of the overall virtual worlds “universe” is challenging. Recent figures published by K-Zero ([www.kzero.co.uk](http://www.kzero.co.uk)) indicate just over 300 million registered accounts (as of 2Q-2008). Applying the generic rule of thumb would imply a current user base of approximately 30 million reasonably active users. The numbers prepared to pay a monthly subscription (if we apply the ratios described above) would be less than 3 million.

### **2.1.2 MMORPG Population**

Ongoing surveys of the MMORPG sector carried out and published at [www.mmogchart.com](http://www.mmogchart.com) indicate a global total of approximately 16 million “active” subscriptions to MMORPGs. There is still an imprecision in these figures since they count subscriptions rather than subscribers (players may maintain several accounts) and it is unclear in some cases whether subscriptions during the initial free trial period are included. Nevertheless, since the vast majority (allowing for an element of counting free subscriptions) these numbers represent individual accounts which are being paid for – generally a good indication of active usage. In comparison, the numbers of users in virtual worlds of the non-gaming variety (such as Second Life) who pay monthly fees to maintain a premium account are significantly lower, although it is probable that most “active” users of such

environments are economically active in that they convert real-world money into “in-world” currency on an as-required basis, even if they prefer not to commit to a monthly subscription.

### **2.1.3 Social Networking Population**

Whilst existing social networking may not (yet) qualify as virtual worlds, there is no doubt that they represent the largest population of potential virtual world users in the coming few years. Figures from established monitoring sources such as Comscore ([www.comscore.com](http://www.comscore.com)) indicate numbers of unique visitors (globally) for the leading sites (including Facebook and Myspace) of approaching 400 million in June 2008. Whilst there will be a element (possibly quite significant) of dual counting (users visiting several sites), this number exclude sites such as CyWorld where it is reported that more than 25% of the population of South Korea have an account.

## **2.2 Market Segmentation**

### **2.2.1 Demographics**

Whilst there has been much focus and interest in market numbers the answer to the question “Who is using virtual worlds?” is actually more valuable than knowing how many users there are. Combine the answers to both questions and you have the basic information to allow a focused and prioritised approach towards virtual worlds.

Once again however, accurate statistics are hard to come by. Again K-Zero ([www.kzero.co.uk](http://www.kzero.co.uk)) has published comprehensive segmentation of the target markets for numerous virtual worlds. Other reports confirm the reality that the usage of virtual worlds today is dominated by the kids and tweens segment (typically those aged 15 and under). The fastest growth is in virtual worlds such as Barbie Girls, Club Penguin and Neopets targeting the younger age, typically under 10 years of age. At the opposite end of the spectrum we find Second Life standing almost alone. Figures published by Linden Lab reveal that almost 85% of users are aged 25 and over and almost 50% are aged 35 and over. Even for virtual worlds where the target age is lower (high teens) private discussions reveal significant numbers of users aged 35 and over and the fact that these are frequently the most committed and active residents. Such evidence clearly demonstrates that the market for virtual worlds is distinctly split, with high numbers of users in the lowest age groups and significant numbers of high-activity users in their late thirties and beyond.

Most interesting is the lack of any broad penetration in the late teen and twenty-something audiences. This is a demographic dominated by conventional social networking sites, console gaming and the active MMORPG players (a community whose average age is 26-27 according to most studies).

This perspective is reinforced by discussions with individuals in their teens and twenties. Those few that have investigated virtual worlds will comment “There was nothing to do” and “There was no-one there to talk to”. Neither observation is necessarily correct, but it highlights and validates earlier statements about the importance of people in virtual environments.

### **2.2.2 Geography**

It is often assumed that virtual worlds are predominantly a US-centric environment, but this is not true. Interest has always been high in Asia Pacific (where the anonymity provided by interactions via avatars meets the cultural preferences for personal privacy). Growth in China has been strong and Europe has more Second Life residents than North America. If we extend our perspective to include social networking sites then future prospects also show distinct geographic differences.

Market penetration is low in India for example, where extended families and strong social ties reduce the need for online community participation, whilst the looser family structures of North America and Europe, combined with a cultural inclination towards individual PC ownership, encourage a life centered around online social networks. In China, a one-child per family policy has created a generation with few siblings, aunts or uncles, thus creating an environment where social networking fills a personal need for membership of a community.

## **2.3 Purpose**

Virtual worlds encompass a wide range of environments, intended for distinctly different purposes. As the technology matures and the market evolves we are starting to see clear distinctions in the target markets.

### **2.3.1 Consumer focused virtual worlds**

Whilst the consumer-oriented virtual worlds are always the primary focus of attention, irrespective of their age-group focus, different styles of virtual worlds are starting to emerge.

#### **2.3.1.1 Social networking**

Social Networking virtual worlds are focused in providing support for residents to actively interact with each other and participate in group and community activities. Typical examples include IMVU, There.com, Kaneva and Habbo Hotel. Recent entrants include Google's Lively although it remains unclear whether this environment will remain focused here or as a brand immersion environment. Note that many worlds will span two or more segments, especially in the near term whilst the market is still evolving. Social Networking worlds are effectively providing a "web place" to residents rather than the "web page" offered by conventional social networking sites such as facebook.

They tend to offer residents a personal space – usually borrowing the "room" metaphor and encourage the personalization of the space through the purchase of items – this being the basis of the business model. Typically targeted at teens and below, moderation and control of content are common to reduce intellectual property infringement issues and user created content is not a major element. Developers can create items and arrangements are often established with real-world brands to enable in-world advertising, product placement and sales.

Critical to the success of these environments is an emphasis on continual activity, staging events, concerts and new products to drive individuals to return on a frequent basis. This can best be likened to programming a TV station and emphasizes the role of virtual worlds as an immersive media and communications channel, rather than an content creation environment.

#### **2.3.1.2 Brand extension**

This has been an active sector for virtual environments, with existing media companies such as Disney and MTV, program and content owners such as the CSI franchise and toy manufacturers such as Mattel, Webkinz and Lego seeking to extend their products, programs or services into a parallel channel. Worlds such as Virtual Laguna Beach and Virtual Eastside allow fans of the TV program to interact with the characters and become immersed in the storyline and set beyond the confines of the scheduled program. A number of worlds intrinsically linked to physical toys and products have also emerged, such as Barbie Girls. Because of the clear targeting and good understanding of the wants and needs of their target demographic these environments have proven popular and successful, attracting large numbers of new accounts in a short period after launch.

Virtual worlds in this category serve to significantly increase brand immersion and exposure, with clear benefits to the brand owners. Rather than the typical engagement time measured in

seconds (for conventional advertising and media) visits to the virtual world will typically be 15 minutes duration or longer. With its business model based on advertising and an emphasis on relationships with existing new media development agencies, it is probable that Google Lively will feature strongly in this category as brands seek to re-introduce their brands into the virtual environment in 2009.

### **2.3.1.3 Gaming**

Many virtual worlds contain elements of gaming, usually of the “casual gaming” style rather than more serious games typically referred to as MMORPGs. At the same time, MMORPGs contain strong elements of social interaction (outside direct gameplay) and many now include strong economic elements and trading activities (such as Eve Online and Entropia Universe).

### **2.3.1.4 General**

Virtual worlds with no specific goals or focus represent a major category, with Second Life being the primary example. This environment emphasizes the ability for users to create content, from simple objects through to extensive structures and complete user “experiences”. Their flexibility has made them an attractive option for experimenters looking for a platform, for enterprises and individuals looking to exploit virtual world environments for a wide variety of purposes. The downside is that the extensive functionality (in terms of design tools etc.) that they support complicates the user interface and the broad focus can make it difficult for individuals to locate like-minded residents in order to interact. This often leads to accusations of “it wasn’t interesting” and “there was no-one to talk to”.

## **2.3.2 Education focused virtual worlds**

Virtual worlds, building on a history of academic research and simulation have a well established presence in educational establishments.

### **2.3.2.1 Simulation**

Virtual worlds recreating deterministic environments (such as Flight Simulator) have a long history and are well understood to provide a valuable and increasingly realistic training environment. They have particular value where the real world activity is either expensive, dangerous or complex. With the steady advance of affordable computing power simulations are increasingly implemented on desktop systems rather than the supercomputers of previous generations.

### **2.3.2.2 Role/Scenario playing**

Building on the roots in simulation, the ability to link multiple systems together and enable multiple individuals to interact in a common (virtual) space has extended the role of virtual worlds into human-based, complex, non-deterministic scenarios. Role playing and scenarios are widely used and recognized as effective training environments and typical examples now include military exercises, emergency services and disaster scenarios. The advantages of cost, safety and the ability to repeat exercises are clear. Leading vendors who have concentrated on this space include Forterra Inc. and Proton Media, but many organizations have created effective environments in generic virtual worlds such as Second Life.

### **2.3.2.3 Teaching**

Virtual worlds are increasingly being used for teaching at all education levels from primary through to tertiary level education and beyond. A growing number of universities in various countries are making courses available to students via virtual environments and there is growing interest in the use of virtual environments to enhance existing distance learning solutions.

### **2.3.3 Enterprise focused virtual worlds**

In 2007 following the initial high levels of interest in virtual worlds a wide range of well known global brands (as well as lesser known organizations and a number of public sector and non-profit organizations) established a presence in Second Life. These early experiments have proven problematic and very few have achieved any real success. A growing number of organizations have either formally closed their presence, have significantly downgraded their involvement or simply abandoned the environment – leading to the “ghost town” syndrome of commercial presences with nobody around.

The reasons for this are various, but are generally due to a failure of the usual due diligence carried out by organizations to plan effectively and monitor progress throughout the project. In conversations with enterprises it becomes clear that the majority, swept up in the hype and “cool” factor of virtual worlds, abandoned their usual structured approach and went ahead with few clear ideas of what they were trying to achieve, who the audience was, what the value proposition was and what would constitute success.

As a result, enterprise involvement in virtual worlds has declined significantly over the last 6-9 months and the growing economic concerns are unlikely to make matters better, as enterprises seek safety in proven solutions and well established channels of communications. In reality, such a conservative attitude may not be the best approach, but in the current circumstances it is all too understandable.

The majority of enterprises viewed virtual worlds as a simple extension of web-based or e-commerce and looked to establish business models accordingly. Without understanding the demographics (the profile of the resident community was generally older than expected) and their attitudes were significantly biased against enterprises, authority and government. A comment at one virtual world event regarding commercial advertising was “that was exactly what I moved into the virtual world to avoid!”.

#### **2.3.3.1 Training & Education**

Education, or more specifically training in the enterprise environment is proving a rich opportunity for virtual worlds, especially when developed in internally hosted environments (often referred to as “intraverses”). Scenario based role playing is well established in the business world and the public sector, and any scenario which involves potential risks to individuals (such as military training or emergency evacuations), high costs (such as civil defence scenarios), complex environments where the outcomes are non-trivial (such as disaster or famine relief) or take a long time to play through (such as aid programs) is a prime candidate for transfer to a virtual world. Other options take advantage of the lack of constraints in the virtual world compared to the physical. The ability to explore inside a molecule, or to fly through outer space, or get inside confined spaces to see what is happening are all huge opportunities for virtual worlds.

#### **2.3.3.2 Collaboration**

A growing number of enterprises are starting to deploy virtual worlds, either via private islands in something like Second Life, or stand-alone solutions or services like Qwaq Forums to hold virtual meetings. You can collaborate on documents, view slides, review information and discuss progress - all without setting a foot outside your door. We are starting to see business-oriented “shells” being built on top of Second Life to integrate more effectively with existing calendaring tools - Immersive Workspace from Rivers Run Red is a good example of this, and with its origins in the collaboration teams at Sun Microsystems, Project Wonderland is likely to emerge as another strong contender sometime next year. We will see many more as the demand for remote

collaboration grows - fuelled by an increasing attention to rising travel costs and environmental impact and a recognition of the countless hours being wasted in global travel. And cost can be a big issue, especially when hundreds of employees are involved for big offsite meetings. As the costs for these type of meetings head towards the million dollar mark, the virtual world alternative is going to start to look increasingly attractive.

### **2.3.3.3 Socialisation and community building**

Apart from the problems of collaboration within projects today's organisations also suffer from their very virtual nature. When people don't go into the office anymore the social elements of work, those casual conversations you have in the lobby, in the lift, around the water cooler or the coffee machine simply don't happen anymore. Virtual worlds are starting to be examined by enterprises as solutions, however partial, to this problem. It is all very well having great tools for collaboration within the project team, and between individuals who have a direct need to communicate with each other - but enterprises also need to maintain the casual conversations, the serendipitous remarks, comments and ideas which are often the spark that initiates a new idea or solves a problem.

### **2.3.3.4 E-commerce**

Although virtual worlds had their early exposure with enterprises as potential E-commerce platforms, this application sector is lagging behind at this time, and this is likely to continue for the next 18 months or more. Until resident populations increase, become more mainstream, and the overall user experience becomes simpler, doing business in a virtual world remains an unlikely proposition for most enterprises.

### **2.3.3.5 Mirror worlds**

Recent developments have led to an increasing availability of comprehensive 3-D spatial and geographic data, and the ability of many virtual-world platforms to import this and use it to re-create the original landscape. Mirror worlds are virtual re-creations of real-world environments that can be exact duplicates. This builds on the long history of spatial simulations. Transportation simulation — including flight, shipping and ground-based transportation — is increasingly used to train operators without the costs and risks associated with the real-world environment, and is recognized as highly immersive and accurate.

As recreational and educational use of mirror worlds becomes more widespread, opportunities for virtual tourism will arise, offering environmental benefits and opportunities for disabled/disadvantaged travelers to experience locations otherwise inaccessible to them. (Virtual tourism not only reduces travel but also could help protect sites such as Machu Picchu in Peru, where real visitor numbers are strictly controlled to prevent massive erosion of the fragile site.)

At a scientific level, NASA is using virtual simulations of remote landscapes to evaluate extraterrestrial transportation options and operators. Enterprises' re-creation of complex environments, such as offshore platforms or chemical/manufacturing plants, as virtual worlds to teach staff safety procedures and escape routes is also becoming an option.

## **3.0 Critical Success Factors**

### **3.1 Learning from the past**

The explosion of interest in virtual worlds in 2006 and 2007 led to the rapid growth in enterprise interest and large numbers of poorly executed virtual world projects by enterprises. As has previously been mentioned, the failures were made worse by the lack of the usual business management and project planning. The underlying reasons for the failures, the lessons to be learned as it were were twofold, a failure to understand the demographics of the virtual worlds they were entering and a failure to engage effectively with the community. Most projects failed because they enterprises didn't do their homework, they failed to understand who the residents were, how many (or how few) of them were actually there, and what they wanted. As a result they were not able to engage effectively, they didn't offer anything the residents wanted and, as a result, found the welcome was, at best one of indifference, at worst outright hostility.

The list of failures is long, the list of successes from the last two years is very short. Those enterprises that did manage a successful foray into virtual worlds have tended to keep fairly quiet and avoid publicity, preferring to take advantage of the competitive advantage their entry into this new communications media provides. Few, if any, of the B2C targeted deployments have been successful, most of the more promising experiments were focused more carefully on internal deployment and had strictly limited goals and expectations. But there are some segments where the results have not been so depressing.

#### **3.1.1 Success in Some Areas**

In the educational sector, virtual worlds have progressed steadily as both a teaching environment and a self-paced learning environment - both at the primary and K12 stages and also in secondary and higher education. At this point in time numerous universities and education authorities around the world are engaging with students via virtual environments although there is still much growth to come. The familiarity and immediacy of the virtual-world environment appeals particularly to children, who already are exposed extensively to computer gaming. This makes some of the educational explorations especially powerful and effective (for example, the relief agency simulations sponsored by the United Nations) at teaching the difficult compromises and interrelationships that exist in the real world. More ambitious projects have included Arden — a re-creation of Shakespearean England to provide students with an exploratory environment rich in background context and supplementary information about the playwright's actual plays.

Broadcast media companies have been fairly prompt to embrace virtual worlds as an adjunct to their existing broadcast media delivery channels. Companies like Viacom have been growing their portfolio of virtual environments to support popular TV franchises, and last year saw the rather uneasy alliance between Anthony Zucker (owner of the CSI franchise) and Second Life. Not all of these early efforts have been immediately successful, but the opportunity to really engage with the audience and to control the brand placement and access is a very attractive proposition. Success comes with careful targeting of a specific demographic group, a good understanding of what they want and the ability to create a community where everyone has a common and shared interest. Virtual worlds provide a very immersive environment which requires a much greater level of engagement than is required to watch, or not watch, a TV program playing on the set in the corner of the room. People want to belong. They want to be part of something. They want to be engaged. And virtual worlds enable that in a way that broadcast television simply cannot. Virtual worlds are the 21st century equivalents of the fanzines, fan clubs and groups of the 80's and 90's. In a world where entertainment on demand is increasingly the norm I can see us moving to a situation where the virtual environment is the product, and the TV program is the supporting advertising trailer and recruitment vehicle - although that will take a few years yet.

Combine educational aspirations and the promise of a safe and controlled environment for kids, as many TV companies are now promising, and you potentially have a winning combination, certainly for the broadcasters and their advertising partners - if not their parents. Factor in the attraction of casual gaming (as opposed to serious gaming which may require several hours of dedicated time to successfully achieve a goal in something like World of Warcraft) and the continued growth of kids and tween virtual world populations seems pretty certain for the next few years.

Education, or more specifically training, is another area where virtual worlds have met expectations. We are now moving away from the arena of publically accessible virtual worlds into the area of internally focused virtual environments. So far many of these have taken advantage of the 3D creation capabilities of platform worlds like Second Life (showing the value of strong user created content capabilities and tools) to build private islands and use them for internal training and education purposes. These projects build on the history of virtual reality as a tool for simulation and exploration of scenarios - something that has previously been constrained by the lack of computing resources, graphics and communications bandwidth. Historically we have seen a greater deployment of computer-based simulations of fairly deterministic environments - things like flight simulation and so on, where the physics of the flight envelope are well understood and can be replicated accurately in the virtual environment.

With the arrival of multi-player gaming, increased communications and computing power, we can now link many individuals together to simulate non-deterministic scenarios for training purposes - creating complex scenarios in which individuals play their various roles and interact with each other and the environment. These have previously been implemented on controlled platforms, such as the Olive environment from Forterra Inc, but the ease with which environments can be created in something like Second Life is very attractive - often sufficiently so to offset the uncertainties of availability, control, access and security which are of such importance to enterprises.

## **3.2 Theory**

### **3.2.1 People vs Physics**

The IT industry as a whole, and business in general, tends to be dominated by people with a technical background, an analytical approach or an engineering mindset. Whilst social scientists and anthropologist use technology extensively to analyse their results and observations, programming and product creation in technology markets still tends to fall under the control of the technically minded.

As an inevitable response to this we can see a preponderance of technically oriented solutions, where “function creep” has created solutions which are more complex than actually required to solve a problem. In some cases, it is not even clear what problem is being addressed. User interfaces become complex (an endemic problem in IT as increasing computing power has removed the need for tightly programmed solutions). Technologists are very good at deploying technology to solve technical problems, but as technology has become an inherent (and increasingly invisible) element in people’s lives, the problems are no longer so much technology issues as usage and usability issues. Virtual worlds are not about technology, they are about people and communities.

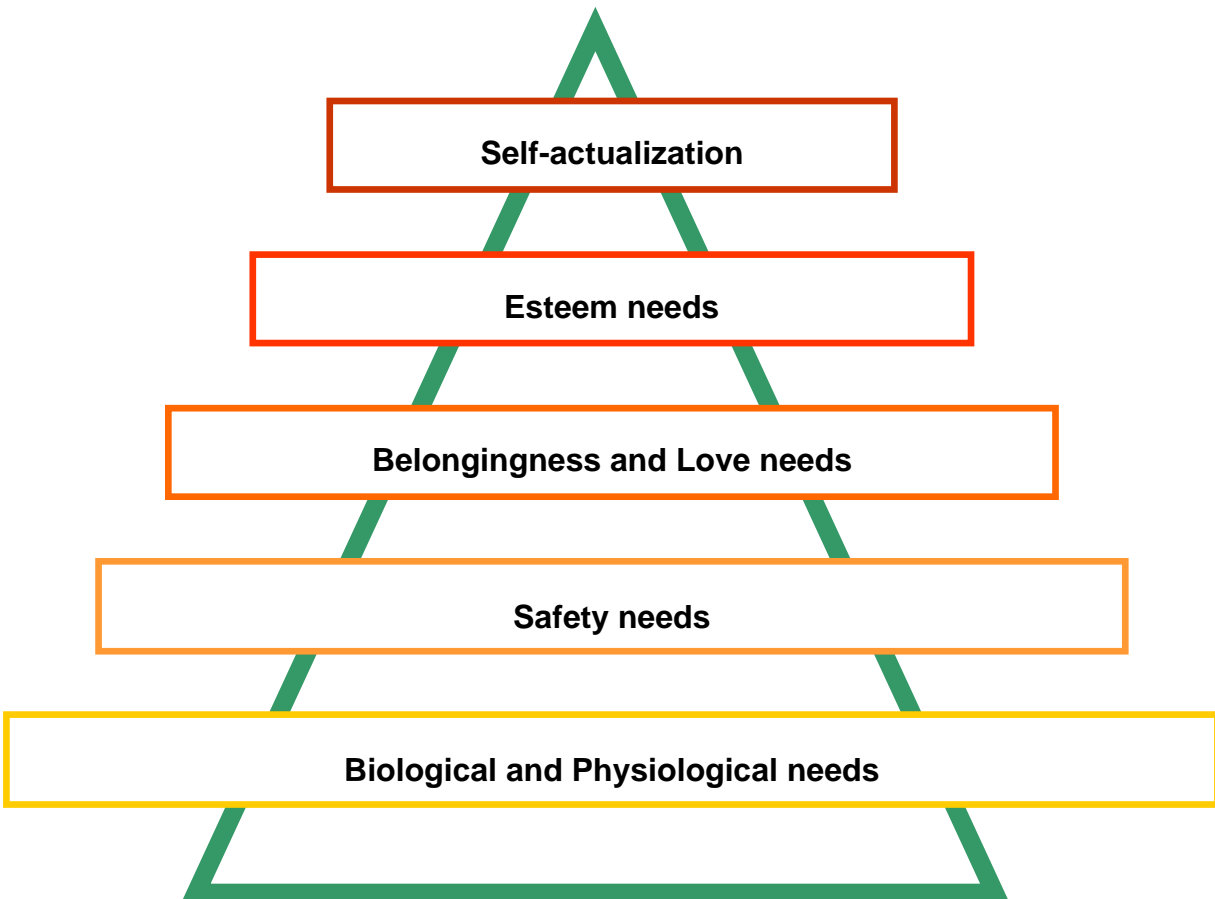
### **3.2.2 Community vs Creation**

Whilst some virtual environments have made a great play about their powerful content creation tools, and these are very valuable for those who need them, the reality is that most users neither have the skills nor inclination to create objects in a virtual world. This mirrors their actions in the real world – we shop rather than build. The increasing democratization of IT – growing

affordability, easy access to communications and a global internet – has enabled global communities with rapidly expanding reach, participation and influence. Communication, and a need to belong are essential and fundamental aspects of human behaviour.

### 3.2.3 Maslow's Hierarchy of Needs

Research into human motivation and behaviour published by Abraham Maslow in 1943 (See A H Maslow – *A Theory of Human Motivation*, *Psychological Review* 50 (1943):370-96) provides clear support for this. After basic biological and physiological needs are met and safety and security assured the need for “belonging” (either to a family or social group or in the context of work, towards the workplace community) comes into force, followed by self-esteem, respect and status. The higher levels, addressing the need for self-actualisation are less directly relevant in this context, although individuals activities inside virtual worlds may play a significant role in achieving these higher order needs. (Note, later versions of the hierarchy contain up to seven levels, but the original 5 level model is adequate for our purposes in this context).



**Figure 1:** Maslow's Hierarchy of Needs

Belonging is about being part of a group, be it in the real world or in the virtual environment. Virtual worlds that ignore this to concentrate on functionality do so at their peril. Esteem comes from how we interact with others and how we are perceived by others. It builds on our membership of a community and our role and position inside that community. Exercising our creativity and talents to build objects, create art is a hollow achievement if there is no-one to share the creation with or to offer the respect and praise for our efforts which the human animal craves. Community and belong must come before creativity.

Community and socialization must precede creation in order to maintain an active and viable environment and those virtual worlds that have fully appreciated and addressed this reality have generally speaking been more successful at attracting and nurturing an active and expanding resident community than those which have focused on creation over community. In addition, most people find it is easier to engage with other individuals who are like them. We may desire new experiences but we value familiarity. This means that worlds that are tightly focused on a specific group of individuals are easier to enter than those which are more general. If you are a fan of Barbie dolls and you visit Mattel's Barbie Girls then the value proposition is clear. There is a very high probability that the first person (avatar) that you meet will share your interest, and is probably very much like you. Therefore you have something in common and it is easier to build on that to create a relationship and become a respected and valued member of the community – building on the need for belonging and then esteem described by Maslow. The common heritage allows us to engage actively, to get involved and to start to care about the other individuals we meet, the community we have joined and the virtual environment we share. In simple terms our loyalty is to the community, not to the underlying technical platform.

In contrast if we look at the value proposition of one of the general purpose consumer targeted virtual worlds where the emphasis is on user created content and users are left to their own initiative to form communities, what do we find? Within the total user community there will no doubt be many people who share your likes and dislikes, who are just like you, whom you might want to engage with – but can you find them? In reality, your chances of finding them by accident are slim and the vast scale and geographic scope of these worlds makes the task even more challenging. The result can be a generally unsatisfying experience which is not compensated for by the wide variety of tools and rich functionality on offer.

### **3.3 Secrets of Success**

#### **3.3.1 Focus and Engagement**

So both well established academic research and recent evidence from existing virtual environments points towards the secret of a vibrant, active, dynamic virtual world is actually community rather than creation, it is to focus on people rather than the physics. And when you focus on people you must really focus – know your demographic in detail, understand what they want, who they are, how they behave and meet those needs. In fairness, the general purpose worlds like Second Life cannot be described as failures because they are not, but their growth has slowed as the market has broadened and many new users are turning towards worlds which match their needs more closely.

#### **3.3.2 Availability of Content**

However, worlds which offer rich development environments, support creativity and emphasise content creation have an important place in the market and act as a critical sandbox for enterprises wishing to experiment with virtual environments, but we do not expect to see a return to the explosive growth of 2007/2008 in this sector.

Worlds which focus on community cannot ignore content creation, people want to spend their in-world credits or money to personalize their experience. It is therefore important for these worlds to develop and maintain active developer programs and make tools available to partners to create the broad array of products and services which are required to fuel the in-world economy. Content creation tools do not have to be made available to all users, but they must exist.

### **3.3.3 Enjoyment and Fun**

In addition to focus, engagement and the availability of content there are two other factors which are critical to success. The first is the notion of FUN! Kids, by and large, know how to have fun and can, and will, make a game out of anything. Educationalists have learned that we learn through play and exploration and that enjoyment is a crucial element in keeping young minds engaged. For adults the challenge is somewhat different. Societal pressures, the need to conform, to provide security, food, safety (Maslow again!) conspire to push us into doing things which are required, often leaving little time for discretionary activities. What is clear however is that when faced with alternative ways to spend those discretionary resources (monetary or temporal) we tend to favour those things which we enjoy rather than those which we do not.

Significant published research into the activities of gamers indicates that some individuals are spending 20-30 hours per week in online gaming, much of this time having been “stolen” from activities like television or other forms of entertainment. Online games fulfil all the major motivational needs, they combine the sense of belonging to a community, the opportunity to gain respect and esteem within that community through demonstrating our prowess, the opportunity to help others as well as being fun, engaging and often unpredictable (when we are playing against others). It is no surprise therefore that many of the virtual worlds targeted at younger individuals contain strong elements of casual gaming and this trend is likely to grow.

### **3.3.4 User Interface**

Finally there is the inevitable technology related element. The barriers to entry must be low and usability high. The current user interfaces leave much to be desired, especially when they cater to content creation and broader functionality which the majority of users don't want. Good user interfaces should be essentially invisible – providing just the functionality required and essentially intuitive. These concepts are well understood in other areas, so why have they not been universally adopted in the virtual worlds space? Whilst there are challenges in using existing hardware devices which have evolved over 25 years or more to accommodate the window-based GUI that has become the industry norm, the virtual worlds industry could take a leaf from the console gaming industry in addressing the problems of movement and control in a 3 dimensional environment.

### **3.3.5 Secondary Factors**

There will always be a myriad of additional factors which make one world successful and another less so. Many observers believe that the richness of the 3D environment is critical to success, pointing out the growing acceptance and attraction of HDTV programming and the increasingly photo-realistic environments to be found in the gaming world. Whilst a beautiful environment is undoubtedly pleasing and satisfying to view, does it make a difference? Human imagination is incredibly powerful and no-one would deny the compelling visions and “virtual worlds” created by writers, which have no substance or realization other than in our own imagination. Parents will have experienced the ability of young children to turn a cardboard box into a palace, a stagecoach, an airplane and much more besides, and the intense satisfaction they derive from this.

Academic research indicates that once the human brain focuses on a task then our ability to see peripheral objects or alternative activities is significantly diminished. It is referred to as

“Perceptual or Inattentive Blindness”. We simply don’t notice things we are not focusing on. Thus in virtual world environment such as a racing game, our attention is dominated by the road ahead and the detail in the scenery speeding past becomes unimportant.

Similarly, one of the most successful and long lived virtual worlds, Habbo Hotel, uses a simplistic 2.5D isometric rendering of the environment and cartoon characters as avatars. Many worlds targeted at younger children use similar simple graphics with no apparent loss of engagement and significant benefits in terms of processing power and bandwidth utilization to render the images.

At the opposite extreme, when we attempt to recreate the real world in convincing detail (especially people) we encounter the “uncanny valley” (first described by Japanese roboticist Masahiro Mori in 1971). Essentially as we create a more and more lifelike image, the human response increases in empathy until it suddenly collapses, recovering only when the level of realism reaches almost 100%. Scientists debate the evidence but the entertainment industry is all too aware of the reality, following significant negative responses to films like *The Polar Express* and *Beowulf*.

The significance of avatars in virtual worlds is equally debatable. There is no doubt that as individuals we can increasingly empathize with our avatar and in many cases spend many hours and funds to create a truly personalized avatar which represents how we wish to be perceived by the in-world community. The ability to realize fantasy characters is attractive to many, although such characters are declining in number (especially amongst enterprise users) and even in the consumer space there has been a move towards the creation of avatars which more closely resemble our real selves rather than stylized aspirational figures. Such attitudes are cultural. Recent events in the social networking market have highlighted the significant differences in the desire for anonymity in virtual environments between Japan and the USA for example.

Realistic environments, lifelike avatars and a wide range of animations are attractive to some users and in some environments, but are probably not critical to overall success.

### **3.4 Best Practices for Enterprise Deployment**

With continuing high levels of media attention, enterprise interest in virtual worlds remains considerable, but many business leaders are skeptical of investing, because of the continuing lack of clarity regarding the proven benefits. Such skepticism is likely to increase, as criticisms surface and ongoing projects are seen to fail. Despite understandable concerns about investment during a time of growing business uncertainty, we believe that the internal deployment of virtual worlds offers most enterprises significant benefits in cost savings and improved productivity.

Gartner recommends a structured approach to internally focused virtual-world projects that best meets the objective and return-based investment criteria of most businesses. Externally focused virtual-world projects are difficult to justify for many enterprises. Early attempts suffered from a lack of clear objectives and a limited understanding of the demographics, attitudes and expectations of virtual-world communities. As a clearer understanding of the dynamics of this new media channel develops, we expect this situation to change during the next three years.

#### **3.4.1 Virtual Worlds as Training Environments**

Every organization has a training budget, and the use of role-playing and simulation is well established as a valuable interim step between the safety of an enclosed learning space, such as a classroom, and the uncontrolled and diverse experiences of the real world. In activities where risks or costs are high, effective simulation enables students to learn, practice and make mistakes

(an essential element of the learning process) in a safe environment, repeating procedures or exercises to fine-tune their skills and perception, and to optimize the outcome. While hands-on experiential learning in fields such as medicine or the military remains indispensable, simulations enable participants to build confidence in their abilities without placing patients or other participants at risk.

The ultimate goal of simulation is to mimic the real system with such accuracy that it can be explored in a cost-effective and safe manner, before attempting to replicate those actions in the real world. When simulating physical objects (such as the flight envelope of an aircraft), the mathematics are well-understood and predictable, making simulation relatively easy. Simulation of complex and unpredictable social interactions is more challenging. However, simulation can be preferable to the real world, allowing time to be compressed and extraneous details to be removed. Modern virtual-world platforms enable a high degree of realism to be introduced into the simulation, creating a highly immersive environment where skills (hard and soft), procedures and knowledge can be enhanced and practiced in a way that is impossible in the real world.

Substantial virtual environments are being used in training emergency services (such as medical, fire and police) and military/law enforcement services to simulate real-world scenarios, including public order control and medical emergencies — especially complex scenarios involving multiple agencies, such as biochemical emergencies or terrorist incidents in urban locations. The market leader in this sector is Forterra Systems, which has a significant established customer base in local, state and national-level authorities, as well as a smaller, but growing, base in the educational sector.

On a smaller level, users are building limited environments in public virtual worlds (such as Second Life), although using a private island to control unauthorized access is strongly recommended. Private virtual worlds or "intraverses" (which are hosted inside the enterprise firewall) avoid issues of identity and access control, as well as problems with the security of conversations. This sector is less well-developed, but a growing number of emerging solutions — including Sun's Java-based Project Wonderland, Multiverse, Open-Sim and Croquet — are available.

The ability to stream media into virtual worlds and embed documents into display objects enables trainees to proceed at their own pace to assimilate material, and then interact with each other and their trainers to explore their understanding and knowledge. Such environments do not need to be extensive, to have expansive land areas, "cute" design ideas or unnecessary adornment to be successful. Indeed, such unnecessary adornment is potentially counterproductive and risks attracting negative attention by highlighting the "game" aspects of virtual worlds to senior management.

Because the learning curve for trainees can be considerable (especially for those without previous computer-gaming experience), accounts should be established in advance for all trainees. Limited avatar customization options should be provided in the initial phases, and significant effort should be expended to provide basic training in the early sessions to ensure a basic level of competence. The complexity of the standard Second Life user interface is a negative at this point, and every effort should be made to limit the complexity of interface options to enable trainees to concentrate on the material to be absorbed, rather than the process itself. Academic research demonstrates that, once users focus on the content and have clearly defined short- and medium-term learning goals, their distraction levels from the user interface and concerns over the unfamiliarity of the experience begin to decline rapidly.

At this stage, the costs of virtual-world involvement are easily constrained. The benefits of improved employee knowledge and training can be clearly enumerated, and the savings (or transference of funding) compared with established training methodologies can be reliably calculated to build a credible and substantiated business case.

### 3.4.2 Project-based Avatar-enhanced Collaboration

Having established a viable presence for virtual-world technology inside the enterprise, and begun to build basic virtual-world skills in the employee base, the second phase involves extending virtual-world deployment to support collaboration and employee interaction. For small project teams based in a single office, the real-world meeting remains ideal; however, in the typical virtualized business environment with large project teams spread across multiple physical locations (and often time zones), team meetings and collaboration can be problematic.

Gartner recommends that accounts and avatars (with limited customization options) be created for all project members in advance. Because of the commercially sensitive nature of the materials that are likely to be discussed in meetings, deployment in a secure (intraverse) virtual environment is strongly recommended. Even when private facilities are used in public worlds, records of chat and conversations may be stored on remote servers under foreign legal jurisdiction, leading to concerns about e-discovery and disclosure regulations. Examples of successful projects of this type include worldwide product launches involving training, presentations and project planning that eliminated the need to bring employees from multiple locations to a single site, with substantial savings in travel and associated costs and time.

For most purposes, it will only be necessary to build a conference facility/"war-room" in which meetings can be held or presentations made. Enterprise-targeted offerings, such as Qwaq, which provides fine-grained, multiuser access to Microsoft Office documents and other enterprise applications, may prove adequate. Alternative solutions could involve creating appropriate facilities in the chosen intraverse environment. Again, the specific focus on the content, rather than the distraction of unspecified exploration of a virtual environment, aids acceptance and accelerates the learning curve. By scheduling meetings at a specific time, users who might otherwise be reluctant to participate are forced into using the environment and are clear about what they're meant to be doing, rather than coping with the ill-defined expectations and goals in a generic virtual environment.

At this stage, limit deployment to the specified project, protecting the scope of the project from "creep," which could undermine the measurable benefits from a senior management perspective. The clearly defined and tightly constrained link between the use of the virtual environment as a collaboration tool and the scope and success of the project enables the achievement of objectives and the enumeration of the benefits to be clearly demonstrated.

Deployment costs should be minimal and be clearly linked to the project. Apart from project-based success metrics, the ability to show cost savings — that is, reduced use of expensive videoconferencing or telepresence facilities, as well as reduced international travel and "downtime" — to support and offset the initial investment forms the basis for a credible and defensible business case.

### 3.4.3 Non-specific Social Collaboration

Employee interaction and collaboration are well-understood as key drivers in employee satisfaction, productivity and innovation. However, in the modern distributed business environment, with employees working from home offices, on the road or in multiple locations overseas, "casual social conversations" that (in the days of employees being concentrated in a few large, office-based locations) took place around the water cooler, the coffee machine or the staff restaurant (or after work) no longer occur. Employees increasingly work in isolation, with communication focused on planned meetings, teleconferences, e-mail, instant messaging and so on. Although these work within the confines of planned communications, the broader-based interdepartmental discussions that are often the source or seed of new ideas and innovations no longer take place.

A virtual-world recreation of the social environment — seating areas, white boards, even a virtual water fountain — can serve a valuable function in recovering the disassembled social cohesion of the workforce. With a workforce already familiar with avatar use through previous stages, restrictions on avatar customization can be eased, and only limited training and support are likely to be required. Again, deployment in a private facility of a public environment or on an internal intraverse is the preferred solution, and the costs of building this type of facility will be minimal, because it represents a simple extension to established facilities.

The benefits can be significant, but will be hard to enumerate, because they will be predominantly in the "soft benefits" area of employee satisfaction, morale, retention and innovation. Nevertheless, with a proven record and established management acceptance of virtual-world projects, the business case for this final stage should be acceptable.

### **3.4.4 Top Mistakes to Avoid**

Take a cautious and staged approach toward introducing virtual world projects into the enterprise. Moving too far and too fast will significantly reduce the chances of success, increase costs and make the benefits more difficult to quantify and attribute.

#### **3.4.4.1 The "Games" Syndrome**

Virtual worlds are not a game, and strenuous efforts should be made to avoid unnecessary embellishments of the environment or fantasy elements of the environment and/or avatar. It may be possible to give your avatar pink fur and a tail in a virtual world, but such options have no place in the business environment, and nothing will undermine virtual-world projects in the eyes of skeptical senior management more quickly than needless embellishments.

#### **3.4.4.2 Poor Project Planning**

Virtual worlds are just a tool. They're not a silver bullet, and, despite the media hype, their deployment will not automatically confer success on any project. Good project planning, tight control of expenses, careful adherence to timely deliverables and all the usual project controls need to be applied. Determine what your objectives are, assess your achievement of them and be prepared for objective external scrutiny.

#### **3.4.4.3 Deployment Creep**

Don't be tempted to add additional features "because you can" and get carried away with the potential of the environment. You are rarely trying to create a parallel universe — simply a functional environment with the functionality and facilities to get a job done. Unnecessary extras will impinge on the achievement of project objectives, soak up resources and budget for no gain, and undermine credibility with a skeptical management. Know what you need and keep tight control over the scope of the deployment.

#### **3.4.4.4 Providing Users With Too Many Choices**

Avatars may only be cartoon-like characters on a computer screen, but individuals rapidly start to build considerable empathy with their avatars. In the early stages, however, they can waste a lot of time selecting and experimenting with avatar features. For business projects, limited options are perfectly adequate. Leave greater freedoms until later in the life cycle, when they will not distract from the attainment of necessary project objectives.

#### **3.4.4.5 Taking It External**

You will encounter pressure to build externally focused virtual-world projects, to give customers and partners access, to support e-commerce and to strive for a wide range of public-relations objectives. At this stage, resist these absolutely. Most of the early virtual-world projects

undertaken by enterprises in public virtual worlds such as Second Life have been less than successful. A combination of unclear objectives, overambitious expansion, unspecified goals and exuberant enthusiasm have caused widespread disillusionment, and many projects have been closed down, quietly abandoned or struggle on in a visitor-free ghostlike state. The time for external virtual-world projects for general enterprise use will come; however, for now, success is largely limited to child-targeted virtual worlds and broadcast media tie-ins.

### **3.4.5 Computer Gaming becomes respectable!**

Recognizing the complexity and inherent reality (albeit in a science fiction/fantasy genre) of their online game EVE Online, operators at CCP Games recruited a full-time economist to further study the dynamics of the fiscal transactions and behavior in the environment. More recently, the difficulty and complexity of succeeding in this game (and others, such as Entropia Universe) have made business leaders and management trainers realize that these so-called "games" are significantly more complex and realistic than the traditional business simulations used in management training. In a similar vein, the complexities of the financial trading opportunities in Linden Lab's Second Life have led to a re-creation of almost the entire real-world financial infrastructure, including banks, stock exchanges, fraud and crime.

The IBM Global Innovation Outlook Report on Gaming ([http://domino.watson.ibm.com/comm/www\\_innovate.nsf/pages/world.gio.gaming.html](http://domino.watson.ibm.com/comm/www_innovate.nsf/pages/world.gio.gaming.html)) provides a useful overview of the transferable nature of gaming skills, the profile of players and the enterprise value to be realized from taking a more serious look at this increasingly popular source of entertainment.

## **4.0 Technology Directions – 2009 through 2011**

### **4.1 Browser-based virtual worlds**

The current virtual worlds pose significant problems to casual users from the complexity of their user interfaces, the size of the client program, the technical issues they pose (especially to enterprise users attempting to run from behind the firewall and with typical enterprise-standard notebooks) and the substantial learning curve. Whilst browser-based virtual worlds cannot currently (and will probably never be able to) offer the rich functionality and powerful user interface of some of the thick client environments, they do provide a solution to many of the current problems. They tend to be simple, almost intuitive to operate (cursor and mouse keys to move and limited range of options regarding camera position relative to the avatar for example) and allow inexperienced users to move effectively within minutes. They frequently lack the powerful tools to support user created content and the ability to heavily customize and animate an avatar. Whilst many regard these as critical failures, for the new user they allow access to the virtual environment with little or no learning experience.

It is likely that coming developments will find some middle ground between the functionality of the thick client environments and the simplicity of the browser-based ones. However, for many enterprise oriented uses, such as virtual conferences, content delivery, virtual commerce, training and a myriad of other uses, the simplicity of interface, the ease of use and the ability to operate with only a simple plug-in to the existing browser is a powerful advantage. Whilst some form of download is still required, these environments are more acceptable to the enterprise IT department, concerned with client desktop stability, maintaining a corporate firewall and eliminating support for non-standard application environments. On top of this, the ability of these environments to operate effectively in the older, less powerful enterprise notebooks is equally critical. For many enterprise users, still using 2-3 year old systems, a single core processor and

512Mb RAM is still a common environment. Compared to today's powerful consumer-oriented devices where support for rich media and gaming is taken for granted and dual core processors and 2Gb and more of memory is standard, browser-based virtual environments are the only viable option.

New developments in this area include Webflock, recently announced by Electric Sheep Company and Google's Lively. A key target of these worlds will be to provide brands with immersive brand "experiences", where the exposure time will typically be measured in minutes rather than seconds.

## 4.2 Interoperability

Interoperability sits alongside browser-based worlds to provide simplicity and ease of use, combined with simplified access to multiple environments. Over the past year or so there has been much talk of interoperability, of one single metaverse rather than the constellation of unconnected islands that we have today. This is unlikely to happen, because of business-related issues rather than technical constraints, and because it doesn't really make sense. There must be a reason to travel, with my avatar and assets (skills, features, and objects) from one world to another. In reality there are few reasons to do so, and little inclination on the part of most users. Why would I want my World of Warcraft avatar to appear in a more commerce oriented world? People are getting increasingly used to maintaining separate digital personae as a means to segment their increasingly complex online lives and to control the otherwise free flow of personal information when it isn't strictly necessary. We don't have a single website, nor do we tend to frequent only one social networking site, but we do tend to use a single browser (kind of) and have standard ways of rendering and navigating around webpages. The same level of uniformity in the virtual worlds arena would be beneficial and will slowly emerge over the next 2-3 years. The issues will be primarily related to asset ownership and transferability, identity management and trust and reputation management rather than the somewhat simpler technical challenges of standardization.

## 4.3 Mirror Worlds

The next two years will see a huge explosion in mirror worlds – using the growing availability of geospatial and location-based information to recreate a virtual representation of the real world without having to create it prim by prim. The ability to import existing information, using standard 3d data description languages and standards will become a standard capability for most virtual world environments, at least in their developer toolkits if not in the user client software.

Virtual travel, being able to visit a location and check out the details that matter to us personally; being able to go into a hotel and book a room (by dropping through to the existing website) is an interesting and compelling notion that could eliminate some of the nasty surprises from traveling in real life. However, the travel industry need not worry (although it will need to take note) – people are still going to want to experience the real thing, despite growing concerns over carbon emissions and fuel prices that are unlikely to fall in the foreseeable future. What people want to avoid however is the unexpected discovery of a refuse tip just beyond the carefully positioned photograph in the holiday brochure.

## 4.4 Extending User Interfaces

Technology is advancing rapidly, especially in the consumer electronics sector and the area of "gestural computing" – using gestures and human movement (rather than a simple mouse) to control computers. The advances in video processing have radically changed consumer electronics. Facial recognition, ensuring that cameras focus accurately on faces in the frame are now commonplace, and systems can even recognize a human smile and trigger the shutter accordingly to capture the moment. The same capabilities can be applied to recognize an upheld

hand and display a menu (specific to that user, based upon facial recognition) and have now found their way into the first generation of high-end media-oriented notebooks such as Toshiba's new Quosimo.

Alongside this we have the demonstrations of 3d video cameras being used to interpret body movements and provide inputs to the computer system. Targeted at online gaming (which represents the current leading edge of computer technology) such systems are currently expensive, but the first order for a million units will see process fall dramatically. The ability to move forward simply by leaning forward, to move left by looking left and to have avatar hand and body movements, to say nothing of facial movements, mimic those of the user would revolutionize the user experience.

Multi-touch user interfaces such as those introduced by Apple and the mainstream adoption of inertial sensors from the early introductions in the Nintendo Wiimote through the the current release of mobile phones offer a broad range of new opportunities for virtual world developers to radically improve the user experience. These type of user control experiences will trickle out into the virtual world arena over the next 18 months. If they do not, virtual worlds will be abandoned by the next generation of mainstream casual user who is simply not prepared to spend hours familiarizing themselves with complex user interfaces. They simply expect things to work and to be intuitive.

#### **4.5 Mobile Access to Virtual Worlds**

Access to the internet via mobile devices has become the norm, especially for the younger generation. Mobile virtual worlds will be a huge opportunity over the next two years. Mobile access to mainstream social networking sites like Facebook, MySpace and content distribution sites like YouTube are commonplace. Mobile oriented social offerings such as Twitter and the ability to automatically add location information will become more widespread. If virtual worlds are to meet the challenge of attracting the next generation of social networking users, they must ride the mobile wave or be left behind.

Virtual worlds are about community, and people will wish to remain in touch with and involved with their community even when they are away from their notebook or desktop environment. Functionality may be restricted, the screen size will force a simplification of the interface (which may be a good thing!). Projects like Sulake's Mini Friday have demonstrated that a limited interface is acceptable and if people identify with a community they wish to remain involved even when they are on the move.

#### **4.6 Extending Virtual Environments to the Web**

As computing power grows then so will the levels of detail and realism, whether it is strictly required or not. However, this is not likely to be a high priority for users. More valuable, especially to commercial enterprises, will be increasingly seamless connectivity with the existing (2 dimensional) web environment and the real world. Shopping on the web today is a pretty lonely and isolated experience, and shopping in the real world is time consuming and less than satisfactory – physical stores are challenged to stock all the items in all colours and all sizes. The ability to take advantage of the social possibilities and rich, immersive environment of the virtual world , but when you want to buy something for real, simply dropping through a “window” into the existing 2 dimensional website, offering a proven and secure environment for e-commerce is a compelling idea that makes a lot of sense and integrates well with the existing infrastructure, preserving the huge investments already made.

## 5.0 Grand Challenges

Virtual worlds have come a long way in the past few years, although they can trace their roots back to the early days of computing. However, to realize their full potential will require some significant challenges to be addressed.

Firstly virtual world developers and operators must switch their focus from the technology towards the user experience. They have emphasized user created content over community support and ease of use, have put physics before people, with all too predictable results.

Secondly, user interfaces must improve dramatically, through the elimination of unnecessary functionality (or it's submergence to lower layers of the menu) and the integration of gestural computing technologies – to make the interaction through a virtual environment as natural as face-to-face.

Browser-based, or at the very least thin client, environments must emerge to provide a simpler, easy to download environment that will open up virtual worlds to the mainstream.

Finally, developers should recognize the huge opportunities offered by increasing enterprise interest in virtual world technology – but not in a publicly accessible environment. Enterprises need secure platforms to avoid the issues of security, scalability and control which constrain their exploitation of public virtual worlds. There are more than one billion PCs in the world today (and another one billion or more smartphones) and the majority of those are still in the enterprise environment. Today's developers appear overly focused on consumer facing virtual environments, but the bigger market lies within the enterprise and the business model is considerably easier to work with than attempting to monetize a community in the consumer space – a challenge which is facing (and has currently eluded) most of the social networking operators.