Second Life
Virtual Worlds
and v-Commerce

A White Paper

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**Introduction**

Virtual Worlds are worlds realised by computer. They differ from games in that they have no rules, plots or objectives. They are non-prescriptive. In a virtual world you just do what you want to do, for as long as you want to do it. That may range from simply chatting to someone, or doing some sightseeing, through playing games or going to a concert, to running a business. Virtual worlds are potentially the ultimate expression of user generated content.

The first virtual worlds were text based, ran on mainframes, and were typically offshoots of so-called Multi-User Dungeons (MUDs). The coming of the Internet enabled such worlds to be accessed more easily and the late-90s saw several graphic based worlds opening up, such as WorldsAway. These typically required the user to download a client application which drew the world, saving on bandwidth (a major issue in the times of dial-up Internet). The user was presented with either a first-person perspective view of the world, or a typical gaming “over-the-shoulder” viewpoint. Users were represented as avatars, human or non-human characters which they could design and dress as they liked.

During their first decade virtual worlds grew quietly. The basic operation (client and server, avatars) remained unchanged and several worlds competed for users including Alpha World (the place to be in the early noughties) and There.

Since January 2006 things have suddenly hotted up. The focus has been on a particular virtual world – Second Life. Run by a US company called Linden Labs, Second Life has started attracting big name clients, including the BBC, Reuters, Toyota and IBM. It has a developing in-game and real-world economy and business ecology, and is currently not only the best marker for where things are going, but is also the closest we currently have to the Metaverse envisaged in the seminal cyberpunk book, Snowcrash.
This white paper explores the concepts behind virtual worlds, and looks at the present state and future opportunities for virtual commerce.

**A Quick Survey**

Second Life first opened in 2003. It currently (17 Jan 07) has over 2.6 million users, and is growing at a rate of over 30% a month. Usage statistics for some other virtual worlds, and related on-line games are:

<table>
<thead>
<tr>
<th>World</th>
<th>Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second Life</td>
<td>2.6m (1 Dec 06, up from 1.7m on 1 Dec 06, 250,000 in Jun 06, and 50,000 in Sep 05)</td>
</tr>
<tr>
<td>There</td>
<td>Unknown, est 100,000s</td>
</tr>
<tr>
<td>Alpha World</td>
<td>2 million guests</td>
</tr>
<tr>
<td></td>
<td>70,000 citizens</td>
</tr>
<tr>
<td>World of Warcraft (WoW)</td>
<td>7.5 million</td>
</tr>
</tbody>
</table>

The table below gives an idea of the differences between some of the main virtual worlds:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Second Life</th>
<th>There</th>
<th>Alpha World</th>
<th>WoW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture</td>
<td>Client-Server</td>
<td>Client-Server</td>
<td>Client-Server</td>
<td>Client-Server</td>
</tr>
<tr>
<td>Avatar Editing</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Object Building</td>
<td>Yes</td>
<td>Limited</td>
<td>Yes</td>
<td>Limited</td>
</tr>
<tr>
<td>Scripting</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Land Owning</td>
<td>Yes, Costs</td>
<td>Limited, Costs</td>
<td>Yes, Free</td>
<td>Through Game</td>
</tr>
<tr>
<td>Physics Engine</td>
<td>Detailed</td>
<td>Simple</td>
<td>Minimal</td>
<td>Minimal</td>
</tr>
<tr>
<td>Game Rules/Tasks</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Real-world business ecology</td>
<td>Extensive</td>
<td>Minimal</td>
<td>Minimal</td>
<td>Niche</td>
</tr>
<tr>
<td>Character Conversations</td>
<td>Text</td>
<td>Text</td>
<td>Text</td>
<td>Text</td>
</tr>
<tr>
<td>Media Streaming</td>
<td>Audio &amp; video</td>
<td>Audio</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Web Services</td>
<td>Two-way</td>
<td>No</td>
<td>Limited</td>
<td>No</td>
</tr>
<tr>
<td>Subscription</td>
<td>Free or $9.99 a month</td>
<td>Free or $9.95 one off</td>
<td>$69.95 a year</td>
<td>$19.95 a month</td>
</tr>
</tbody>
</table>

"It is not just social networks that are trying to capitalise on 'Web 2.0', as the increasing role the Internet is playing in peoples’ lives has been termed – virtual worlds, too, are making a noise, and the one with the most sonorous trumpeting at the moment is Second Life"

– Marketing, Dec 2006
The Coming Generation

Whilst many may struggle to see the importance of virtual worlds it is worth taking some time out to look at the activities of teenagers, and even primary school kids. There is now a whole range of virtual environments designed to attract the younger generation, and many have been huge successes. These break down into a number of sub-categories, which also broadly reflect the age of the typical user:

- Cutesy, typically animal-centric games where children “grow” a pet and play games to get more points to buy things for their pet. Category leader is probably Neopets, Disney's ToonTown probably fits here, as does Club Penguin.

- More open worlds (but with some task structure and no building) like Runescape (developed by British company Jagex)

- Worlds that emphasise human interaction (such as Habbo Hotel, and even adult 3D sex worlds such as RedLightCenter)

- Game based worlds such as World of Warcraft, Star Trek On-line, Star Wars Galaxies and Sims On-Line

- Junior versions of the true virtual worlds such as Teen Second Life and AW-Teen

The important point is that a generation is growing up which is completely at home in virtual worlds. They may actually spend more time in such worlds than they do watching TV or playing stand-alone (or even net-play) computer games.

Indeed many are already subverting the virtual worlds to use them in other media. Machinima – creating movies without a camera – is a favourite hobby of game players and virtual world users.

As this generation become independent consumers (and independent producers and business owners) we can expect that virtual worlds will become increasingly important.
System Architecture

Most of the current virtual worlds operate on a client-server model. This means that the main world description, all objects, and the locations and appearances of each avatar are stored and tracked on a central server. Each client programme contains some of the basic primitives (e.g. shapes, textures) used by the world, but relies on the server sending it instructions on what is in view, and so what it should draw on the user's screen, as the avatar moves around the world.

This architecture emerged out of necessity to keep bandwidth requirements low. All that need be communicated between server and clients are a series of object IDs, components and locations – the client can then render the scene that the user sees. Even with the greater bandwidths now available this architecture still provides the best performance over a busy Internet.

Some variation is seen in other worlds, for example game-based worlds with a more fixed environment can store more data on the client, and the simpler, more child-friendly, games can use Macromedia Flash based clients operating in the browser. The “holy grail” would probably be a pure browser based system, but a lack of widely adopted standards for 3D graphics and rich interfaces, and the variability of Internet bandwidth, hamper this.

Avatars

The users of a virtual world are represented in-world by an avatar. In a truly open world such as Second Life this avatar can be of any shape and design – from human or animal to toaster or abstract. Associated with the avatar can be clothes and accessories. In SL there is a whole in-game industry of independent designers creating new body shapes, clothes and accessories and selling them to users for in-game currency. Users can typically have an unlimited collection of clothes, and even body-shapes.

Favourite Places in Second Life

Here are just a few of our favourite places in Second Life:

- Second Life Library
- Science Center, with NOAA and NPL displays
- Midnight City, home of SL shopping
- Suffragem, a dystopian future
- Virtual Dublin, just the place for a pint of "Gwiness" (sic)
- Abbots Aerodrome, for planes, helicopters and parachuting
- Yadni's Junkyard, hundreds of objects for free
- Nakama, three Japanese worlds in one
- Svarga, a natural utopia

Use Place Search in SL to find these, or get a SLURL from our web site.
Whilst some users model their avatar on themselves, others take a more original view. S&M and vampish designs appear particularly fashionable, as do “furries” - anthropomorphised animals.

The client usually allows the user to not only walk or run their avatar through the world, but also to fly (with or without wings). There are also a variety of gestures that the avatar can perform, such as bowing, waving, turning, sitting and so on. In SL actions can be defined in a scripting language and shared through objects. This opens up the way for not only choreographed (and synchronised) dance moves, but also combat actions and artistic performances.

Character Interaction

Central to virtual worlds is character to character interaction. This is typically a text based interface - with users typing and reading what is said. One recent independent innovation in SL has been to implement translation software so that you can type in English but have your character “speak” French or another language - and vice-versa.

Worlds emerging from games have started implementing voice based interaction – an obvious step with the wider use of VOIP and heavily used in combat orientated on-line multiplayer games, whether PC or set-top box based. However in open worlds such as SL such interaction has its drawback – particularly for male players playing female avatars (and vice-versa), or anybody playing an animal (or toaster). The use of Skype alongside Second Life is, though, common for business meetings and conferences.

A possible line of development may be to implement text-to-speech systems so that audio is used by the avatars, but driven by typed input. This would allow a user to choose a “voice font” that better matched their character. The final step would, of course, be to use speech recognition to interpret the users speech into text, and then use that directly (or via a translator) to drive a different text-to-speech voice.
Most virtual worlds also support Instant Messaging communications between players who are out of sight but in-world. Some also offer out-of-world messaging. Friends lists are also a staple, alerting users when their friends are on-line.

**Building**

The “open” virtual worlds allow you to build your own things, or buy and/or copy things that have been built by other users (another in-world industry). These things may range from hand-held objects such as coffee mugs (complete with steam) to skyscrapers. All are built in a modular fashion using an in-world what-you-see-is-what-you-get editor. Functionality (e.g. a lifting lid on the coffee cup) and dynamics (such as the steam) can be added by writing small computer programmes (called scripts) and “attaching” them to an object.

SL has already bred not just object builders, but specialist designners. Some are virtual architects – concentrating on structures, some build vehicles, and some even specialise in virtual musical instruments.

The environment is just another collection of objects as far as a virtual world is concerned, so trees, grass and even snow are just objects to be designed (and re-designed) and scripted.

In some worlds you need to own land to build on (eg SL, There), others let you build anywhere that isn’t already claimed (eg Alpha World). Of course the advantage of a virtual world is that you can easily build in 3 dimensions, so that a 512 sq m plot can become not just a skyscraper but also a series of unique 512 sq m tiers.

**Economics andOpportunities**

Economics operates in a number of ways in a virtual world. The business opportunities are closely linked.
First is the business model of the virtual world provider – how do they make money? Most have settled on a subscription model. Prices depend on the target market. Game players typically pay the most (there's a brand to account for), and pre-teens the least (pocket money prices). Some have a free basic membership (usually with no building or land ownership rights), and then a tiered full membership (SL is $9.99 a month as at Dec 06).

This base is then supplemented by selling things and land in game currency, and allowing users to “buy” game currency with real-world currency. Second Life uses Linden Dollars (L$), and you can currently (Dec 06) buy around L$500 for £1.

Game based worlds have also started to look at in-game advertising as an additional source of revenue (in SL there is nothing to stop anyone putting up a billboard – if they can find the right plot).

The in-world economy is where users buy and sell in-world items, land and services with the in-world currency. This is the dominant form of in-world economics. Linden Labs reckons that there are over $1m (US Dollars) worth of transactions every day in SL.

For sellers there's the issue of what to do with the world currency they earn. Almost uniquely Second Life lets you convert Linden Dollars back into real currency. Second Life has just clocked up its first US Dollar millionaire (in terms of assets owned if converted back into US$), and there are reckoned to be over 200 people earning over $1000 a month, 20 making a full-time living, and five making more than $200,000 a year (Nov 06). However, for most real business the serious money at the moment is to be made in the real world by using virtual worlds as a business tool or marketing platform driving real-world sales.

For those who do want to leverage the in-world opportunities one approach is to look at a classification of real-world activities and to identify how they apply in the virtual world. For example:
A housing company could build virtual houses
A train company could operate part of the Second Life railroad
A sports company could host in-world sports events
A university could provide learning spaces

A table based on this approach is at Annex A. This same analysis could help inform where the opportunities are for using SL to help build RL brands and drive RL sales.

A second approach is to look at what models have been successful on the web, and see what the equivalent would be either in SL, or to support the SL community. For instance:

- Snapzilla replicates the Flickr model for sharing images captured in SL
- BlogHUD replicates the blogging model
- 411 Search replicates the search model
- SLURL replicates the Google Maps model
- SLEExchange and SLBoutique replicate the on-line retailer models

When will we see the Del.icio.us, Yahoos, and eBays of Second Life?

- Support Ecology (SE)

There is a growing business ecology operating very much in the real world in support of virtual world users. The most well-known are the south-east Asian “sweatshops” building high ability characters for time-poor, cash-rich players in the West.

Other examples though are the consultants now working on major projects for corporate clients, for instance equipping the BBC Island or building the Reuters offices. For people and organisations with good virtual world expertise this will be a significant business opportunity, particularly as the user base extends beyond those willing to put a lot of time and effort into getting established in the world.

"By emphasising creativity and communication, Second Life is different from other synthetic worlds...From new approaches to corporate branding to education, Second Life is a petri dish for innovations that may help people in real life"
– The Economist, Sept 2006
A virtual world can act as a catalyst for purely real-world transactions. The most obvious opportunities are where the world is used for sales and marketing purposes, driving users to a real world product or service. Advertising will no doubt play a role here, as does PR. Recent campaigns in SL by Toyota and Nissan show the way here.

The other approach is just to see a virtual world as a business tool - one that can enhance a business’s own services or operations. Simple examples are using the virtual world to support virtual meetings and conferences, using it as a simulation tool as part of a regeneration programme or medical education initiative, as an e-learning or distance learning platform, or as an advanced platform for collaborative data visualisation and analysis.

Second Life is particularly suited to this type of usage since it supports a two-way web interface. This lets you move data easily between the web and Second Life, either to display data and objects in SL automatically (eg pricing, inventory, process data etc), or to bring SL data into the real world for further analysis (eg footfall, visitor and shopper data etc). See Annex B for more information about web integration and some example systems.

A final use is to see virtual worlds as a "sandbox" for real life. This could apply not only to the testing of architectural designs for human interaction with the built environment, but could also apply to technology and even social modelling.

- The Two by Two Model

<table>
<thead>
<tr>
<th>Virtual World Cash</th>
<th>Virtual world trades and access (VWE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real World Cash</td>
<td>Sales &amp; Marketing</td>
</tr>
<tr>
<td></td>
<td>SL as a tool for simulation and collaboration (RWE)</td>
</tr>
<tr>
<td></td>
<td>Some product sales and access Virtual World “consulting” and &quot;design &amp; build&quot; (SE)</td>
</tr>
</tbody>
</table>

Second Life Lingo

Here are some common terms used in Second Life:

- **Avatar:** The character that represents you in SL
- **Continent:** SL has two continents, Main and Southern. Main is the older.
- **Estate:** A large area of land - usually many sims, owned by one person/company
- **Inventory:** the place where you keep all your belongings in SL
- **Island:** an area of land usually privately owned and not associated with one of the two continents
- **Linden Dollar:** The SL unit of currency. About L$500 = £1.
- **Lindex:** The SL currency exchange
- **Prim:** one of the basic shapes out of which all SL objects are built
- **Region:** synonymous with sim
- **Resident:** an SL user
- **Rez:** creating a unit in-world, typically by dragging it form your inventory
- **RL:** real life
- **Sim:** the standard unit of land, 256m x 256m
- **SLURL:** an HTTP type URL that can be used on a web page to link to a location in SL
- **Teleport:** the ability to move instantly from one part of SL to another
All of these models can be summarised in a 2 x 2 matrix (well we are consultants!):

The unpopulated quarter is for external services paid for with virtual world cash. Why shouldn't a user buy their MP3 downloads, or even clothes or books, from a virtual world store but have the delivery made to them in the real world. The implementation of this mode is surely only a matter of time, but is surrounded by some serious economic issues as the different virtual "worth" of real and virtual objects could cause significant inflation and other instabilities in the virtual world. Like any other currency the controller of the Linden Dollar will have to pay attention to the sound control of money supply.

**First Movers**

2006 saw a number of major brands and organisations beginning to buy up Second Life land and establish first-mover operations there. Some examples are:

<table>
<thead>
<tr>
<th>Who</th>
<th>What</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBC</td>
<td>Staged the Radio 1 Big Weekend in Dundee and video fed it into a festival tent in Second Life</td>
</tr>
<tr>
<td>Adidas</td>
<td>Made virtual Adidas trainers available to SL residents</td>
</tr>
<tr>
<td>Aloft Hotel</td>
<td>Built a virtual equivalent of their new real-world hotel</td>
</tr>
<tr>
<td>American Apparel</td>
<td>Established a virtual shop selling virtual clothes for avatars which copied their real fashion lines</td>
</tr>
<tr>
<td>Cisco</td>
<td>Opened two islands, one as a demo area and the one as a private area for company developments and partner and client education and training</td>
</tr>
<tr>
<td>IBM</td>
<td>Established a private island - Hursley - as an R&amp;D facility. It is not yet open to the public.</td>
</tr>
<tr>
<td>Lexus</td>
<td>Created virtual models of their new Scion and made them available in-world</td>
</tr>
<tr>
<td>Queens, NY</td>
<td>Used SL to build a consultation model of a new park development</td>
</tr>
<tr>
<td>Reuters</td>
<td>Opened an in-world office and established an in-world news desk</td>
</tr>
<tr>
<td>US Government</td>
<td>Has reportedly built a virtual small US town for Homeland Security training</td>
</tr>
</tbody>
</table>
Other Worlds

This White Paper is deliberately entitled "Virtual Worlds" since there is activity beyond Second Life - although Second Life is the most powerful, and most commercially developed of the current virtual worlds.

The sidebars describe two other worlds. Alphaworld predates Second Life, and whilst it was the place to be in its time it now looks antiquated against Second Life. Whilst a few corporates have made use of it (eg Wells Fargo), the real activity is around SL. One major difference between AlphaWorld and SL is that AlphaWorld was just one of many virtual worlds hosted by ActiveWorlds, and accessible through their client. As a user you could readily create your own, consistent, world, rather than being forced to "buy in" to a consensus world. Multiverse, currently in beta, again makes use of this model and for some brands this "own universe" model may be better than the "island" model of SL. This is particularly going to be the case for things like films where the studio may wish to create a completely immersive environment - and not risk a bunch of goths or hobbits setting up camp in the middle of their gritty thriller or sci-fi space opera.

'There' is different again. Whilst being a single consensus world it offers users far fewer options in terms of what they can do. The emphasis in There is on fun and chat. This makes it a bridge between the more chat based environments such as Habbo Hotel, and the open ended virtual worlds like Second Life. Although demographics aren't available, anecdotal data suggests that There attracts a young crowd - and this is reflected by the fact that MTV opened its Virtual Laguna Beach in There.

There are several other virtual worlds, and virtual world platforms either in operation or under development. Of the latter group one of the most interesting is Croquet. This is an open-source virtual world platform and appears to be technically the most advanced of them all. Apart from displaying not only HTML but Word and Excel documents on objects in the world, you can also create windows and portals from one part of the
world to another. Alice Through The Looking Glass indeed....

Getting a Foothold

If you've read this far and are interested in getting a foothold in a virtual world (probably Second Life) then what can you do?

First, of course, you need to decide what your aim is. This could be:

- to just explore the potential of the technology, but not expect any return
- to get real world PR
- to drive sales and marketing
- to support and deliver real world activities
- to create a collaborative communications environment
- to build a virtual business (possibly as an analogue of your real business)

Your choice may well be driven by the current demographic match between virtual world users and your real world customers - although many of the more serious current opportunities revolve more around bringing in your own staff and clients, rather than selling to those already there.

Most businesses will want to establish a virtual presence, essentially their shop or office in the virtual world. This will involve identifying a location (close to a roadside, teleport hub or popular destination maybe), and then building the structure, and any supporting objects, scripts or interfaces.

Then, of course, you may need to advertise your presence both in the real world (letterheads, collateral PR, marketing, virtual world media etc) and the virtual world (billboards, sponsored events, networking).

A basic user account to get you in-world is free, and even a premium account so that you can own land is only around £5 a month. For your presence in world reckon on around £1000 for a small island (plus £1800 pa maintenance) and anything from £2000 to £20000 for your first project (depending on scope), and then an
allowance for on-going development, maintenance and management.

With your bridgehead established you can then begin to examine how best to further exploit the virtual world. And of course we would be delighted to help you with any or all of this.

A Word of Caution

Virtual worlds are far too early in their development cycles to be completely robust, secure and a dream to use. As such any organisation getting involved in a virtual world needs to go in with their eyes open, aware of the threats and risks, and have a management plan in place to counter them. A few things to be aware of are:

- How secure is the currency system? Can it be hacked or exploited for money laundering or other purposes?
- How secure is property and object ownership?
- Is it prone to in-world viruses and griefing attacks, and how can they be managed.
- How are neighbour disputes and unacceptable behaviour managed.
- How scalable is the system? How is it coping with rapid growth? What planned and unplanned downtime is there?
- How safe is the business and the technical environment.? Is the code open source?
- How prevalent (or possible) is identity or brand theft/hijacking?

Conclusions

Virtual Worlds are genuine early-stage developments. They are not (yet) for everyone. Whilst those currently in their teens and 20s grew up with the Internet those who are currently pre-teens are growing up using virtual worlds. Virtual Worlds and v-commerce will become more and more important over the coming decades. Initially there was a very clear distinction between virtual worlds and the web, but this is now changing. Web services are letting us bring web data into virtual worlds, or control web (and real world) applications and services from the virtual world. As browser interfaces and applications become richer and

Glossary

AI – Artificial Intelligence
Avatar - A 2D or pseudo-3D representation of a person or character
Flash - A programme for creating dynamic 2D and 3D graphics on the web
RL – real life
RW – real world
SL – Second Life
VRML – an XML based language for creating 3D environments.
VW – Virtual world
XML - Extensible Markup Language – the emerging standard for representing data on computer systems
more graphic (e.g., Google Earth), the potential to merge the environments becomes ever more apparent.

As with almost all web undertakings the costs of getting involved are low, and relatively risk-free. You can do it yourself, or bring consultants in to help you. The important thing is that you should start learning about and experiencing virtual worlds now, and work out not only how they can help you with your business, but also how they might affect your business and industry in the future.

**Who are We?**

Daden Limited is an information company based in Birmingham, UK. We have been working with avatar and virtual world technology for almost 10 years. We have built environments in several virtual worlds, and also developed interfaces between virtual and real environments. We have a deep understanding of the possibilities offered by new technologies, but with good understanding of the marketing and usability issues to know what might work, and what won’t.

We have worked on strategy, marketing and technology projects for a variety of companies and organisations including FTSE100, hi-tech start-ups, and public sector organisations, in the UK and abroad.

If you think that we can help you understand virtual worlds and v-commerce a little bit better, or even help you take your first steps into virtual commerce then please contact us:

- By phone: +44 (0)121 247 3628
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- By email: info@daden.co.uk
- In Second Life at: Nari <48,170,134>
- By post to:
  
  Daden Limited  
  103 Oxford Rd  
  Moseley  
  Birmingham  
  B13 9SG

or IM Corro Moseley, our virtual representative in Second Life.
## Virtual World Activities by RL Sector

<table>
<thead>
<tr>
<th>Real Sector</th>
<th>Virtual Equivalent</th>
<th>Existing in-world businesses</th>
<th>Major Brands in SL already</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT</td>
<td>Scripting</td>
<td>Many</td>
<td>Not for scripting</td>
</tr>
<tr>
<td>Construction &amp; Building Services</td>
<td>Structure &amp; Environment Building &amp; Management</td>
<td>Many</td>
<td>None</td>
</tr>
<tr>
<td>Audio Visual &amp; Media</td>
<td>RW Media commenting on VW</td>
<td>Many, eg SL blogs, Metaverse Messenger</td>
<td>BBC Reuters</td>
</tr>
<tr>
<td></td>
<td>VW in-world media</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Machinima</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Access to RW media</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science &amp; Research</td>
<td>Education and Research</td>
<td>Science Center</td>
<td>NPL, NASA, NOAA</td>
</tr>
<tr>
<td>Manufacturing &amp; Engineering</td>
<td>Object Building</td>
<td>Many</td>
<td>None</td>
</tr>
<tr>
<td>Sport &amp; Recreation</td>
<td>Games Organising</td>
<td>Several</td>
<td>MLB</td>
</tr>
<tr>
<td>Land based</td>
<td>Landscape Building</td>
<td>Many</td>
<td>None</td>
</tr>
<tr>
<td>Health</td>
<td>Avatar Building</td>
<td>Many</td>
<td>None</td>
</tr>
<tr>
<td>Motor Retail</td>
<td>Vehicle Building</td>
<td>Many</td>
<td>Nissan, Toyota</td>
</tr>
<tr>
<td>Financial Services</td>
<td>LindeX</td>
<td>Linden Labs, A few others</td>
<td>ABN Amro</td>
</tr>
<tr>
<td></td>
<td>Financial Information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal Services</td>
<td>Contracts, disputes, IP</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Passenger Transport</td>
<td>Teleports &amp; Transit Systems</td>
<td>SL Railroad</td>
<td>None</td>
</tr>
<tr>
<td>Food &amp; Drink</td>
<td>Food and Beverage Objects</td>
<td>Few</td>
<td>None</td>
</tr>
<tr>
<td>Education &amp; Training</td>
<td>SL and RL Learning</td>
<td>SL Library, SL University</td>
<td>Few US Colleges</td>
</tr>
<tr>
<td>Hospitality, leisure, travel and tourism</td>
<td>Clubs</td>
<td>Many</td>
<td>Aloft Hotels</td>
</tr>
<tr>
<td></td>
<td>Hotels/Apartments</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Virtual Tour guides</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Justice</td>
<td>Bouncers</td>
<td>SL Police</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Police</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retail</td>
<td>Retail of own goods</td>
<td>Many</td>
<td>Adidas, American Apparel</td>
</tr>
<tr>
<td></td>
<td>Retail of others goods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>Estate Ownership</td>
<td>Few</td>
<td>None</td>
</tr>
<tr>
<td>Creative &amp; Cultural</td>
<td>Event Hosting</td>
<td>Many</td>
<td>None</td>
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<tr>
<td></td>
<td>Selling Art forms</td>
<td></td>
<td></td>
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<tr>
<td>Personal Services</td>
<td>X-rated clubs &amp; services</td>
<td>Many</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Avatar counselling</td>
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</table>

We can't yet think what the virtual world equivalent of power, logistics, energy and utility companies might be - but who knows....
Interfacing

Most virtual worlds started as relatively stand-alone environments. Any connection to the outside world was limited to the import of images or the streaming of sounds. Alpha World was one of the first to provide a scripting language which could provide some limited virtual world - real world interface.

Second Life now supports both a REST interface for in-world initiated web interfaces, and RPC-XML for web initiated SL interfaces. These open up considerable opportunities for SL and web (and by extension any system) integration. Possibilities include:

- Stock holdings and pricing information from corporate systems
- System status maps (from roads to IT systems)
- News stories
- Entertainment listings
- Chatbots (ie two-way conversations with AI based virtual characters)
- Data analysis

Essentially almost any information that can currently be displayed on a web site can now be accessed from within Second Life.

The advantage of using web services to access your data is that there is no need to make any change to your back end systems as new uses for the services are created (such as the SL interface).