What is a virtual world?
Wikipedia has a great description\[1\]:

“A virtual world or massively multiplayer online world (MMOW) is a computer-based simulated environment. The term has become largely synonymous with interactive 3D virtual environments, where the users take the form of avatars visible to others. These avatars can be textual, two or three-dimensional graphical representations, or live video avatars with auditory and touch sensations. In general, virtual worlds allow for multiple users.”
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Some examples of virtual worlds are:


Minecraft [https://minecraft.net/](https://minecraft.net/)

Eve Online [http://www.eveonline.com](http://www.eveonline.com)

Two of these, Eve and Minecraft, are games whereas Second Life is not. Being a game is not a requirement of a virtual world, but perhaps the most successful virtual world is a game. World of Warcraft was launched almost ten years ago and has had consistently high subscription numbers. In 2012 World of Warcraft had a record 12 million subscribers according to statista.com[2]. Today that number, while still incredibly high, is at a much lower 7.8 million.
According to Guinness World Records[^3], "World of Warcraft is the most popular Massively Multiplayer Online Role-Playing Game" with, at that time in 2008, 10 million subscribers.

So what is World of Warcraft?


It is a game created by Blizzard Entertainment and from their own website battle.net[^4],

"World of Warcraft is an online game where players from around the world assume the roles of heroic fantasy characters and explore a virtual world full of mystery, magic, and endless adventure."

World of Warcraft is a Massively Multiplayer Online Role-Playing Game, MMORPG for short. Blizzard says, "In an MMORPG, you play the role of a unique character in a persistent online world shared by thousands of other players."

All of this information about World of Warcraft is interesting, but what does it have to do with the architecture of virtual worlds? Most virtual worlds like World of Warcraft are proprietary and closed source software so there is no real way to examine the architecture of a game like World of Warcraft. However, it is possible to examine the structure of the virtual world and how the users are allowed to interact with that world to determine some of the structural elements of the virtual world.

In addition to examining World of Warcraft, Blizzard has other virtual worlds which we can explore. By comparing different virtual worlds, specifically those made by the same company, we will be able to examine some of the common components of virtual worlds.
What other virtual worlds has Blizzard created?

StarCraft II
http://us.battle.net/sc2/en/

StarCraft II is the sequel to Blizzard's wildly popular science fiction real-time strategy game that was released in 1998. In a real-time strategy game, players take the role of a battle commander and issue orders to units to build buildings or other units and to attack other player units and buildings.

Diablo III
http://us.battle.net/d3/en/

Diablo III is the third action adventure role playing game in the fantasy Diablo series which started with Diablo in 1996. In an action adventure role playing game, players take the role of a fantasy adventurer character and fight monsters and complete epic quests while gaining experience and loot.

Hearthstone
http://us.battle.net/hearthstone/en/

Hearthstone is a collectible card game set in the same world as World of Warcraft. In this game, players create decks using cards they have won or purchased. Players play other players in head to head games. All of the cards in the game represent characters from World of Warcraft.

How can a card game be a virtual world?

While it's true that it can be hard to understand how some of these games can be considered virtual worlds. The two main components of virtual worlds are a computer simulation of a world and the allowance of many users to take part in the same simulation. In Hearthstone, the world is simply represented and simulated in a very different manner than the other games.

Here are some of the observations we can make about these virtual worlds.
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- How is the world represented to its users?
- What can the users do in the virtual world?
- How can the user interact with the world?
- How can the user access the world?

**How is the world represented to its users?**

In World of Warcraft, the world itself is completely 3D dimensional using modern 3D graphics (all four games have the same types of 3D graphics) and a viewpoint that is either first person or more commonly 3rd person behind their avatar. The user has a wide range of control over the view of the world and their character.

![World of Warcraft](image)

StarCraft II's world is represented in 3D also, but in a much different way. In StarCraft II, the view is a more top-down view that is not centered on any certain character. The player in this game does not have an avatar, exactly. Sometimes there is a main character that they may be playing, but they control this character in the same way that they control all of the other units. The view can be zoomed in, somewhat, but that is not how the game world is typically viewed. This view gives the player a more battlefield command type of view.
Diablo III has a similar view, but is much less zoomed out. In fact, they player is not able to zoom as far out as they are in StarCraft II. This gives the player a much more detail-rich view of the world and this allows them to be more connected to the part of the world they are currently in.
Hearthstone's world is represented quite differently than the other games. In it, the view is completely fixed on a top-down view with absolutely no way for the user to change it. The world itself is mainly made up of the cards and the battlefield. The cards represent the characters in the world and are animated and have vocal tracks and sound effects. The battlefield looks like a cartoonish version of the World of Warcraft world turned into a board game. Despite the way that it looks in screenshots, the game is fully 3d and has a lot of animation and movement. It is not a simple card game like the solitaire games that one might play on their tablet.

While all of these games have 3d worlds, they are all represented to the user in different and sometimes very unique ways. The way the world is represented to the user plays a large part in how the user interacts and is allowed to interact with the world.
How does the user interface help to represent the world to the user?

One especially important thing to represent in the UI is the world itself. The best way to do that is with a good map system. This is what the map looks like in World of Warcraft:

Notice that the character is located where the gray arrow is which the blue arrow is pointing to. This map can be zoomed in to see the continent the player is on. It can be then zoomed in again to see the actual local area the character is in.

This information is invaluable in a game with a large world like World of Warcraft. Diablo III has a similar system. The character is in the blue circle.
Both Diablo III and World of Warcraft also show the local area in a mini-map.
In these mini-maps we can see that there are many points of interest in these worlds. There is a similar mini-map in StarCraft II, but it only shows the location of your units and enemy units that you have discovered. Hearthstone has none of this sort of UI information.

**How can players interact with these worlds?**

World of Warcraft is has interactive elements throughout the entire game. Most of the interactive parts of the world have some sort of relation to a story line or quest. Most of the time, these quest objectives sparkle making them easier to see, like in this quest which requires collecting dung:

In StarCraft II, there is very little interaction with the world itself. Mostly the world is just a backdrop for the action of the battles that ensue there. Diablo III has interactive parts all over its world. They range from destructible parts of the environment, to traps, to lucrative treasure chests, to powerful shrines, and to quest objectives. In Hearthstone, there is little to no interaction with the world. There are bits of the world that you can click on and it will perform some sort of amusing animation. These are very shallow and don't accomplish anything other
than adding a little visual flair. Hearthstone is all about the interaction between the cards/characters.

Another important part of interaction with the world are its controls. All of these games use the mouse and the keyboard but their controls vary in subtle ways. In all of these games they keyboard is used to chat with other users as all of these games are multiplayer.

In World of Warcraft, the keyboard is used to move the character in the world, to use abilities, to interact with the world, and to interact with the UI. The mouse is used to change the view of the world, to interact with the UI, and to interact with the world itself. In World of Warcraft, it is absolutely necessary to use both the keyboard and the mouse to play the game. These are not optional.

In StarCraft II, the game is mainly played with the mouse. The keyboard is used mainly for command or UI shortcuts. The mouse is used to interact with the units and the buildings.

Diablo III is somewhere in between World of Warcraft and StarCraft II as the keyboard is less used than in World of Warcraft, but more so than in StarCraft II. Four of each characters six abilities are mapped to the keyboard as well as potions and other shortcuts. The mouse is used for moving, aiming, attacking, and interacting with the world and other characters. Diablo III was also ported to the Xbox 360 and the PS3. This is interesting because it introduced new ways to control the game. All of the mouse/keyboard controls were converted to gamepads for both systems. This introduced the need for some new UI elements and it also introduced the ability to dodge incoming attacks which is not present in the PC/MAC version. Blizzard has commented that it has no plans to allow gamepads to work for Diablo III on the PC/MAC.

Hearthstone uses the keyboard the least. The mouse is used for, or at least can be used for, every action in the game save for chatting with other players. This is an important note because this is the only one of these games that has been released on a tablet operating system. It was released on iOS.

**How do users move around in these worlds?**

In World of Warcraft, the users are free to move around in normal ways such as walking, running, and jumping. The user is only limited in their movement by the world itself. Once a user reaches level 60, they can purchase flying mounts that allow them to fly in complete freedom. Some areas of the world are off limits to flying, however. In both Diablo III and StarCraft II movement is mostly 2 dimensional. In StarCraft II there are some units that can move over terrain by jumping or flying, but most ground units must go around the terrain. In Diablo III, there is no vertical movement at all. In hearthstone, there is no real movement in the world.

**What kinds of activities can the players engage in in these worlds?**

World of Warcraft is the heavy hitter in this category as it is, by far, the largest and most complicated world of the four. Here's a non-exhaustive list of activities users can engage in:

- Fight monsters
- Gain experience/levels
- Earn money and items
- Complete quests with story lines
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- Participate in seasonal holiday events (think Halloween, Christmas, etc.)
- Earn reputation with in-game factions
- Team up with other players to take on themed dungeons with their own story lines, environments, and enemies
- Fight other players
- Compete with other players in player versus player battlegrounds and events
- Buy and sell items in the online marketplace
- Form communities called guilds for any variety of reasons or purposes
- Master several in-game professions
- Collect many of the collectables in the game (pets, mounts, achievements, etc.)

In any one of these areas there are opportunities for competition from other players, ally and foe alike. The lists for the other games are much shorter. In StarCraft II, players can play the single-player campaign which has an engaging story line and cinematic elements. The only other real option is to engage in one of the games many multi-player modes where the goal is to destroy the enemy either solo or with a team. Diablo III has a similar feature set to World of Warcraft as both games are role playing games. Diablo III just has a smaller subset of those features. For example, in Diablo III, there are no professions, no player versus player battlegrounds, no themed dungeons, no in-game factions/reputations, and no seasonal holiday events. In Hearthstone the user has the ability to take on computer opponents in practice or take on other players in several head to head games. They can also collect cards and create new decks with those cards.

**How can players access these worlds?**

With the exception of the iOS version of Hearthstone and the console version of Diablo III, all of these games are accessed through Blizzard's "Battle.net" client.
In this client the user can download and install the games, purchase the games or subscriptions for the games, buy items from the real money store, interact with their friends, or read news about Blizzard and its games. It is interesting to note that to access these games, the player must have an active internet connection. This allows Blizzard to keep all of the player's information centrally so it is the same regardless of what machine the player logs in from. This is true for both the iOS and the PC/MAC versions of Hearthstone. This does not work, currently, for the PC/MAC and the console versions of Diablo III. Those game worlds are saved separately creating 3 unconnected worlds.

What conclusions can we draw from all of this information?

While we can't derive from this what makes a successful virtual world, we can at least examine what common components these popular virtual worlds contain. While it could be argued that these of these components are elementary, one company would disagree. Worlds INC is currently in litigation with Blizzard over patents regarding virtual worlds\[5\]. Worlds INC has already settled out of court with other companies that own virtual worlds. However, the outcome of the case with Blizzard could be monumental given Blizzard's stature as having the most successful virtual world.

Sources


