**Virtual Reality**

Unlike [**augmented reality**](https://learn.g2.com/augmented-reality), virtual reality is a fully digital experience that can either simulate or differ completely from the real world. The term virtual reality refers to a computer-generated, three-dimensional environment. In order to experience and interact with *virtual reality*, you’ll need the proper equipment, like a pair of VR glasses or a headset.

Purpose of virtual reality

Virtual reality technology is used to create immersive experiences that can help educate and even entertain consumers. Outside of its popular gaming use case, virtual reality is applied in a variety of industries, such as medicine, architecture, military, and others.

Everything that makes up our perception of reality is due to our senses. So, in theory, everyone’s reality is unique to them. Taking that a step further, it would make sense that if you provided your sense with other simulated or computer-generated information, your perception of reality would change – creating a new, virtual one.

**VR software**

Because VR tech creates a completely 3-D environment, you can imagine the amount of software involved. VR software works together with VR hardware to immerse the user into the virtual world. Developers also have to create interactive components within the environments that look and even feel like the real deal.

[**Virtual reality software**](https://www.g2.com/categories/virtual-reality) can be used to build experiences for consumers to virtually test products, learn something new, or build something themselves. Believe it or not, there are even VR social platforms! Learn more about the types of software required to create these types of user experiences, like VR content management systems, SDKs, and more.

VR hardware

VR hardware is used in conjunction with the software to provide the illusion of being in a 3-D environment.  Common hardware includes VR glasses, gloves, and other accessories to simulate other senses like touch.

## Types of virtual reality

There are three main types of virtual reality used today to transform the world around us, including non-immersive, semi-immersive, and fully-immersive simulations.

To get a better understanding of how the technology is used, let’s break down the different types of VR and see examples of each.

### Fully-immersive simulations

Chances are when you think of VR, you’re picturing a fully-immersive experience – complete with head-mounted displays, headphones, gloves, and maybe a treadmill or some kind of suspension apparatus.

This type of VR is commonly used for gaming and other entertainment purposes in VR arcades or even in your home (empty, non-fragile room advised.)

Fully-immersive simulations give users the most realistic experience possible, complete with sight and sound. The VR headsets provide high-resolution content with a wide field of view. Whether you’re flying or fighting the bad guys, you’ll feel like you’re really there.

### Semi-immersive simulations

Semi-immersive experiences provide users with a partially virtual environment to interact with. This type of [**VR is mainly used for educational**](https://bagogames.com/5-ways-of-using-virtual-reality-in-education/) and training purposes and the experience is made possible with graphical computing and large projector systems.

In this example, the instruments in front of the pilot are real and the windows are screens displaying virtual content.

It’s important to keep in mind that semi-immersive VR simulations still give users the perception of being in a different reality. This type of virtual reality is not always possible to experience *wherever*. Instead, physical environments are created to supplement the virtual reality.

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| **TIP**: Some semi-immersive reality experiences are actually considered [mixed reality](https://learn.g2.com/mixed-reality), where digital objects interact with physical objects. |

### Non-immersive simulations

Non-immersive simulations are often forgotten as an actual type of VR, honestly because it’s very common in our everyday lives.

The average video game is technically considered a non-immersive virtual reality experience. Think about it, you’re sitting in a physical space, interacting with a virtual one.

These types of experiences have become  more advanced in recent years with video games like Wii Sports, where the system actually detects your motion and translates it on screen.

Ethical Implication of VR in society

Virtual reality (VR) has made some impressive progress in the past few years. Despite a false start a few years back, VR headset sales are improving, with [more than a million units shipped](https://techcrunch.com/2017/11/28/virtual-reality-headset-unit-sales-are-slowly-improving/) in a single quarter for the first time at the end of 2017. Sony, HTC, and Oculus are seeing increased sales, and VR developers are moving beyond gamers to target a broader market.

So far, most VR engineers and developers have been focused on solving problems like how to make a more comfortable, portable headset, and how to decrease the costs of production so headsets are [more affordable for the general population](https://www.buzzfeed.com/blakemontgomery/oculus-just-slashed-its-prices-but-vr-is-still-expensive). But there are bigger, higher-level problems that still need to be solved in the world of VR — and how we solve them could have a major impact on the future of the industry.

Rather than focusing on profitability or user adoption, VR developers should be spending more time navigating these all-too-important ethical dilemmas. This isn’t a finite list of the ethical questions of VR, but here are the nine issues I believe are most pressing and that we need to resolve as soon as possible.

**1. User protection**

Users may require at least some physical protection, depending on the nature of the headset. If deprived of real-time sensory feedback, users could end up walking into walls or fail to recognize key dangers in their immediate surroundings. There are already some suggested resolutions for this, including [using a circular walking arc](https://www.digitaltrends.com/cool-tech/vr-infinite-walking-wall/) to simulate straight-line walking without ever walking past an intended boundary, but they still need time for development.

**2. User isolation and social effects**

Already, we’ve seen [the rise of technology capable of forming physical addiction](https://thenextweb.com/contributors/2018/03/25/social-media-apps-addictive-slot-machines-similarly-regulated/). Though rare, some individuals are so consumed by social media and/or video games that they isolate themselves from society to an unhealthy degree. When entire, immersive worlds are available to explore, who’s job will it be to prevent that from happening?

**3. Pornographic content**

There’s already some evidence that excessive exposure to pornography could [influence harmful behavior toward women](http://www.dianarussell.com/porn_as_a_cause_of_rape.html). If users engage with pornographic content in an even more realistic environment, with a first-person style of interaction, what effects could that have on violent crime? The problem becomes even more complicated when you introduce the possibility of simulated interactions with real-world people, or the possibility of virtual sexual acts that are illegal in the real world.

**4. Virtual crimes**

Speaking of crimes, how are we going to manage the execution of crimes in a virtual world? Today’s video game culture is separated by the veil of screens and controllers; titles like *Grand Theft Auto*may allow a person’s avatar to kill and steal, but using thumb gestures to control an onscreen character is much different than executing a stabbing motion or pulling the trigger yourself in a hyper-realistic environment.

**5. Real–world applications**

After spending too much time in a virtual environment, it may be difficult for users to return to the real world and behave the same way they did before the virtual experience. They may be desensitized to certain types of violence or interactions, which could damage their social relationships. They may also overestimate their physical abilities, attempting a jump they can’t make or trying a skill they’ve only perfected in a VR environment.

**6. In-game trauma**

It may not be necessary to experience an event in physical reality to experience [the effects of Post-Traumatic Stress Disorder](https://www.thevideoink.com/2015/08/26/virtual-reality-the-rewards-the-risks-with-mike-rothenberg-of-river-accelerator/) (PTSD). For games that require tough moral decisions, or experiences that simulate a harrowing ordeal, participants may be forced to deal with lasting psychological consequences. How are VR developers going to prevent this, or manage it when it occurs?

**7. VR as torture**

What if you could inflict trauma on someone in a virtual environment? Would that count as torture? The answer isn’t black-and-white, but it’s a question we need to explore — and [one that’s been raised by philosophers](https://www.newscientist.com/article/2079601-virtual-reality-could-be-an-ethical-minefield-are-we-ready/).

Military personnel may view VR as a kind of ethical alternative to torture, putting people through horrible experiences without ever inflicting any physical harm. You could make an easy case that this is immoral behavior, but who’s responsible for controlling or stopping it?

**8. Virtual travel**

VR could help people explore the world, introducing them to new countries and locations they might otherwise never get to visit. But what about [sites that severely restrict visitors](http://mentalfloss.com/article/66305/10-coolest-places-youre-not-allowed-visit)? Is it ethical to allow someone to remotely visit a site that’s considered holy? Or allow someone to peek around an ex’s apartment? What kind of limits are we going to impose for virtual travel?

**9. User privacy**

As with most new technologies, we also need to think about user privacy. Users will be able to take more actions and interact with more types of content than ever before, engaging in behaviors they may avoid in the real world. Who is responsible for ensuring users’ privacy, and how could this data be used? Should it be allowed to be given to advertisers, or remain in the individual’s control.

So without any clear, objectively “correct” answers, how are VR engineers supposed to go about answering these questions?

So following strategies can be proposed

**1. Consult:**No matter how simple some of these questions might seem to an individual, VR developers aren’t going to have the answers. Developers and investors need to work alongside psychologists and philosophers to find and support their conclusions.

**2. Invest:**For every dollar we spend on VR tech, we should be spending a dollar on research into the effects of the technology. New studies are necessary to learn how VR could shape our minds and behaviors.

**3. Safeguard:**If a VR developer doesn’t understand the ramifications of a certain feature, they should take measures to protect users just in case; for example, they can downplay the realism of a traumatic scene, offer detailed warnings about the potential effects of a new feature, or somehow proactively detect aberrant user behavior.

Until we have a better understanding of the long-term effects of VR, we need VR developers to prioritize these three important steps.