Augmented Reality 101: AR vs. VR

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Augmented reality (AR) and virtual reality (VR) add new dimensions to how we engage with technology, opening up innovative ways to work.

And even though the two are often bundled together under the catch-all label of “immersive tech,” AR and VR are not the same.

In an interview with the Independent, Apple CEO Tim Cook offered his take on what makes the two technologies different. Unlike VR's fully immersive experience, AR provides "an improvement on what's happening presently.” He noted that “most people don't want to lock themselves out from the world for a long period of time. With AR you can have it be a part of your world, of your conversation. That has resonance."

Let’s take a look at the differences between augmented reality vs. virtual reality and explore how business leaders can use them to enhance efficiency and transform workflows across a diverse set of enterprise sectors.

AR vs. VR: What is the difference?

What really sets augmented reality and virtual reality apart?

Augmented reality: Simulating participation in the real world

Augmented reality enhances what we see in the present by bringing simulated objects and information overlays into the real world.

The technology is commonly available to many of us already—Apple and Android devices can provide AR experiences for users without the need for additional hardware. Simply hold up your device with a suitable AR app open, and voila! You will see virtual objects placed in your camera's view.

Having a phone or tablet act as a “window" into the augmented reality scene does, however, create a barrier to total immersion. Wearing a dedicated headset makes the experience more realistic, ensuring virtual objects blend seamlessly into the environment around you.

No matter how you experience AR, your movement is completely free. As you move around your physical space, you move around the augmented experience as if the simulated content was directly in front of you. And if you walk down the corridor or into a different room, that content stays where you left it. As we'll see, it's that freedom of movement that truly opens up opportunities for augmented reality in the workplace.

Combining “virtual” with the reality around us, AR opens up many opportunities to enhance daily tasks. For example, remote assistance through AR can help frontline workers and field technicians remain engaged and focused on their tasks as the AR technology eliminates the limitations of their physical environment. Digital documentation can be shared instantly and updated easily, eliminating the need for paper processes that tend to be manual and inefficient. Technicians and frontline workers can record sessions for future reference, push notifications, transfer files, track progress on a project, and even bring others into a meeting or conversation.

Virtual reality: Complete immersion; total isolation

While augmented reality blends digital objects into the real world, virtual reality offers a self-contained, multi-sensory 3D experience, where entire environments can be simulated and explored.

There's no way of experiencing VR other than wearing a dedicated headset, which tracks head movement through 360 degrees to adjust the “view” seen through the lenses.

But it's when additional sensors are connected, such as movement trackers (allowing you to move around the simulated environment) and hand controllers (giving you the means of interacting with virtual objects), where the immersion level ramps up.

Throughout the virtual experience, however, users remain “locked in,” so what's going on around them in the outside world is removed entirely from view.

Architects and interior designers can use VR to help clients experience virtual walk-throughs of designs, replacing drawings that are sometimes hard for people to interpret or picture in their minds. And construction projects, such as residential and commercial buildings or bridges, can benefit from VR applications to examine every aspect of these projects, including safety precautions, checking deviations from original or desired designs, testing processes to improve efficiency, and so on.

VR has also been used in the tourism and hospitality industries. For example, hotels and resorts can create a virtual experience for customers to realistically immerse themselves in the location and imagine themselves in the space before they choose to stay there. This can result in improved brand engagement as the VR experience creates a lasting impression on users. Internal to the hotel or resort, VR can help train staff with simulated scenarios in order to improve customer satisfaction.

Virtual tours of real locations can also encourage potential travelers and visitors to experience museums, festivals, vacations, and landscapes, especially with an interactive application. Rather than show travel agency visitors brochures or photos, agents can provide them with an immersive virtual experience. For example, the German National Tourist Board recently launched several immersive travel experiences for tourists who want to explore Germany without leaving home.

How are AR and VR used in the workplace?

Embracing augmented reality and virtual reality has become a logical choice for businesses looking to re-create environments or experiences that are challenging to model in the physical world. As a result, a growing number of companies harness AR and VR to re-think operations across many business functions, from simulated training scenarios to collaborative design processes.

AR: Blending the digital and physical workspace

AR's ability to keep “reality” in focus is a significant advantage that is driving its uptake in commerce. With AR content layered over real-world business assets, employees can access deeper insights to enhance their daily tasks or share observations about the simulated objects presented to them.

So how are businesses using AR in the workplace?

Collaboration: Platforms such as Cavrnus and Spatial use AR to facilitate advanced co-working, regardless of how widely a team is dispersed. Digital assets can be viewed and manipulated by collaborators from multiple locations as if everything was available in one room. With most businesses adapting to the new realities of post-COVID-19 pandemic office work, this offers a level of team working that's way more productive than dialing into a Zoom call.

Medical care: Healthcare professionals have access to advanced 3D imaging equipment, but scans captured by these devices are often presented on flat 2D screens. Brainlab's Mixed

Reality Viewer software, used on the Magic Leap platform, for example, harnesses AR so doctors can view and manipulate scans as if they're immediately in front of them, providing a complete 360-degree picture of a patient's anatomy. And SentiAR is developing solutions that connect physicians to 3D clinical data via Magic Leap to help patients visualize and understand their procedures.

Training and skill development: Overlaying information and intelligence over real-world business scenarios significantly enhances what's possible within a training session. Consider manufacturing environments where new employees are exposed to expensive plant machinery for the first time. Their trainers could “place” a virtual manual next to the equipment for quick reference, then present how-to guides alongside the kit to walk trainees through it all in real-time. Jabil is one manufacturer using PTC’s Vuforia Enterprise AR Suite on Magic Leap for immersive training experiences like that. And PBC Linear, with the help of Taqtile’s Manifest and the Magic Leap AR platform, is seeing an 80% reduction in training time for new workers, and an annual savings of 20% due to less scrap and fewer mistakes. Ultimately, the manufacturer is saving more than $7,000 in onboarding costs per machinist, decreasing the downtime of machines, and increasing productivity.

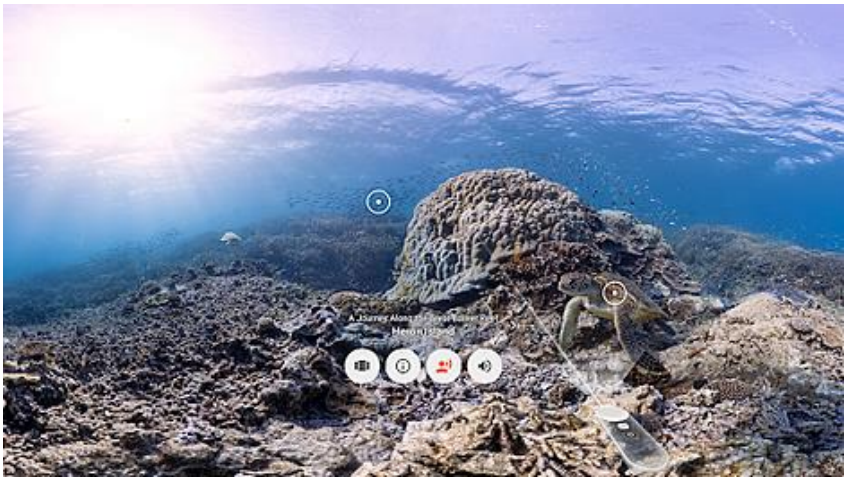
VR: A closed-in environment for immersive experiences

There are some instances where the total isolation offered by virtual reality may be beneficial to a particular application. It's in those instances that VR can be a powerful tool in commerce.

Design: Virtual reality is a great way to visualize 3D design projects, particularly in the property sector. With applications such as The Wild, architects can present their vision in a way that flat blueprints can't, giving clients the chance to explore layouts from every conceivable angle. Likewise, interior designers can also reveal their plans to customers virtually, well ahead of taking a sledgehammer to their walls.

Training: As with AR, businesses can use virtual reality to facilitate more immersive training, albeit training in VR means time away from the workplace. Trainers can simulate work scenarios virtually, a pragmatic approach when equipment is expensive—or environments are too hostile—to risk real-life training delivery. The Industrial Training International's VR Crane Simulator, for example, offers a safe experience for trainee operatives around the world.

Travel and tourism: VR has been used extensively in the travel and tourism industry, offering travelers the chance to fly to far-away places without leaving their sofa through virtual tours of hotels and locations. And, capitalizing on pre-trip planners and stuck-at-home explorers, galleries and museums such as The Tate Modern have also developed VR applications that allow visitors to browse their collections, regardless of their location.



Augmented reality vs. virtual reality: Which is best for your business?

Every business has a unique set of requirements, so when assessing the pros and cons of AR vs. VR in your operation, there's no definitive answer as to which is a better fit.

For blending the real and the simulated world without locking users out, AR is a great choice for businesses looking to enhance daily work practices. The types of practical enterprise applications that can be created using AR are expansive. Imagine a warehouse where the staff saves time navigating the aisles with the aid of live augmented information. Or a factory where technical support is delivered by remote experts, guiding operatives on the shop floor through AR overlays and thereby minimizing down-time.

VR, on the other hand, requires users to be away from their daily activities, which can impact productivity. However, there are instances where total immersion may be preferable. Training police officers on how to take control of a range of complex situations is one example of how VR can recreate challenging scenarios without placing anyone at risk.

What's next?

The journey into the metaverse is already here, and over the coming years, we'll see even more technological advances that will further blur the line between what's real and what's simulated, expanding the possibilities of what AR and VR can achieve in business. Whatever comes next will be even more impressive, but investing now can improve productivity, collaboration, and innovation across your operation.

In case you missed the previous "Augmented Reality 101" series, they're available here:

Augmented Reality 101: What It is and How It Works
Augmented Reality 101: The Future of Work and AR for Business

Image: Google Expeditions, courtesy of Google.