Understanding Use Cases for Augmented, Mixed and Virtual Reality
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Executive Summary

Immersive technology, in the form of augmented (AR), mixed (MR) and virtual reality (VR), is transforming the way we experience and learn about the world around us. It enhances our reality by letting us interact virtually with people, objects and places we may not have access to otherwise. It has also opened many opportunities for brands, allowing them to create experiences for customers and employees that are not “physically” limited. From demonstrating products to simulating environments, there are endless ways for brands to engage, entertain and most importantly, enhance the customer and employee experience through the use of immersive technology.

However, as with any new technology, the idea of using AR or VR poses more questions than it answers for most companies. What are the specific advantages of each type of immersive technology? How can they be incorporated into our business strategy? And if we have to prioritize among them, which technology is most worthy of our investment?

This report is a guide to the entire spectrum of immersive technologies, and to understanding which use cases might deliver the most value and impact for your company. It also offers a set of recommendations for how to best plan and successfully deploy the technology.
The Immersive Technology Market Is Expected To Grow Exponentially

The combined market size for AR and VR is expected to grow from nearly $18 billion in 2018 to $215 billion in 2021.¹ That’s a staggering amount of growth in only three years. It underscores just how quickly immersive technology is expected to go mainstream, rather than remain a novelty.

According to Emily Olman, CEO of VR/AR experiences company Hopscotch Interactive, every company should have a plan for how they will incorporate immersive technology into their business strategy. “It’s a question of when, not if;” says Olman. “The sooner your company is able to understand the language [of AV/VR] and become fluent in what the possibilities are, the faster they are going to be able to react.”

Multiple factors have brought us to this tipping point for immersive technology growth. For starters, the largest tech companies in the world are well into developing the second or third generations of their AR/VR devices and apps. Samsung, HTC, and Facebook are focusing on VR headsets; Microsoft is betting on HoloLens, its MR headset; and Apple and Google are facilitating the development of AR apps for their mobile platforms. The size of these companies allows them to scale production and offer immersive tech devices at more affordable price points, which has been one of the biggest barriers to adoption for most consumers.²

In addition, the quality of the content for AR/VR applications has improved to the point where it is actually compelling enough for the average consumer. For, the last few years, only the adult entertainment and gaming industries were creating quality VR content.
Now, as more content creators embrace the technology, we’re seeing some exciting possibilities in other industries. Hollywood, for example, has announced plans to produce VR movies shot with a 360 degree camera, and retail giants like Amazon and IKEA have launched AR apps that solve a very real problem for consumers: how to visualize product use before purchase.

Lastly, the wide media coverage of the Pokémon Go craze played a big part in raising awareness for AR. Not only did the coverage showcase a very compelling and engaging use of the technology, it revealed just how easy it was to access it. By making Pokémon Go a downloadable game app that works with just a smartphone, its creators demystified AR for consumers and other companies alike.

These factors indicate that immersive technology is well on its way to becoming ubiquitous technology. There are exciting opportunities for brands that understand how to use it to improve customer and employee experiences—especially since in the future, customers will expect immersive technologies to be a part of their experiences, rather than think of them simply as cool gimmicks.

What’s The Difference Between AR, VR And MR?

Although for this report we’ve slotted AR, MR and VR into one blanket category--immersive tech--each of them has distinct features and advantages. In order to understand their differences, it’s helpful to think of AR, VR and MR as points on a spectrum, rather than discrete technologies. On one end of the spectrum, we have “real reality” which is the real world we experience every day, and on the other end we have virtual reality, which is completely removed from the real world and an environment unto itself. Augmented and mixed reality fall somewhere in between. Here’s how we define them:

**Augmented Reality**

This is technology that superimposes a visual experience over a real environment. A good example is the location-based game Pokémon Go, in which players capture anime characters that appear on the screen of their mobile phones as if they were part of the location where players are. For example, you point your mobile phone camera at a park bench and see, through the phone’s screen, an anime character sitting on it. More advanced AR experiences, like holograms, project “living” 3D images onto real environments, which can be seen without any additional devices.

The key feature of AR is that it simply adds to our experience of a real environment without actually interacting with it. If someone came and sat next to or on the anime character on the park bench, for example, the character wouldn’t acknowledge them, or move out of the way. It would simply disappear from the player’s mobile screen.
Mixed Reality

Mixed reality technology is similar to augmented reality in that it superimposes visuals onto the real world. However, the key difference is that the virtual image in mixed reality actually interacts with the real environment onto which it is projected. Microsoft’s HoloLens is an example of a mixed reality device. It projects images onto the real environment you are viewing through a headset, but those images are interactive, and can be manipulated by your real hand. To continue the example above, in MR, the anime character on the park bench might interact with a real person sitting next to them, perhaps moving out of the way, or sitting on top of them.

Virtual Reality

VR transports users into a simulated, interactive, three-dimensional environment that is completely separate from the real world. In its simplest form, a 360-degree video can qualify as a limited VR experience—limited because it allows you to view, but not interact with, the virtual environment it projects. In its more complex form, VR transports users into an environment that’s constructed completely outside their current environment, with completely virtual visuals and audio. For example, by using headsets such as the HTC Vive or Oculus Rift, users can play VR games in which they are “dropped” in the middle of a warzone or on the side of the world’s tallest mountain.

VR is an excellent tool to simulate environments that are too costly, challenging, or dangerous to interact with in the real world—for example, training police officers for high-pressure situations—or even environments that simply don’t exist—such as the mythical kingdom of Westeros from the TV show Game of Thrones. The potential environments we can create in VR are limited only by our own imaginations.
The Five Use Cases For Immersive Technology

With immersive technology on the cusp of mass adoption, it’s no surprise that companies have started seriously considering how they can incorporate it into their business strategies.

However, before deciding to invest in one type of immersive technology over another, companies should have a clear idea of what they want to achieve with it. From our research, we have identified five primary use cases for immersive technology that either solve a problem or improve an experience for the company’s customer or its employees (or, in some cases, both). The unique characteristics of each type of technology can make it more suitable to one or two use cases over the others.

As companies consider adopting immersive technology, we recommend prioritizing the use case that will have the biggest positive impact on employee or customer experience. Doing so will in turn give them clarity on which immersive technology to invest in, along with the best practices for implementing it.

Use Case #1: Create Brand Awareness

For companies looking to get in the news and create brand awareness, immersive technology can be a great way to generate a lot of buzz. The technology is still new enough that companies can appear creative and innovative by using it at events, product launches or in simple advertising campaigns. Experiences such as inviting customers to interact with a celebrity hologram or to play games like Pokemon Go are effective at reaching a mass audience and generating positive brand sentiment.

Recommended Technology: *Augmented Reality*

AR in particular is well suited for creating brand awareness because, unlike MR and VR, it doesn’t require devices for people to experience it, other than at most a mobile phone. In the case of holograms, a person does not need any devices to enjoy the experience. This allows many more people to participate in the experience, which is a crucial requirement for any successful awareness campaign. In addition, Apple and Google already provide AR toolkits for developers who want to create apps for their mobile platforms. This has made the technology more accessible for advertising or marketing departments since it’s now quicker and cheaper for brands to develop apps and content for a platform that already has a mass audience.
To engage fans during the 2015 US Open, Mercedes-Benz capitalized on its endorsement deal with tennis legend Roger Federer by creating an interactive hologram of him. Developed by augmented reality platform VNTANA, the hologram was a full, 3D projection of Federer that virtually “hit” tennis balls served by fans. The VNTANA platform automatically recorded the experience and sent a branded email with a GIF or video to share on social media.

According to VNTANA, almost 8,000 fans went through the activation, a 20 percent increase in consumer engagement over past year’s events. VNTANA CEO Ashley Crowder believes using AR in this case is a far more effective way to leverage an endorsement deal than traditional advertising. “You pay millions of dollars to air one commercial, but that’s usually it,” says Crowder. “With the hologram, the celebrity can interact with thousands of fans, in a way that just wasn’t possible before.”

Figure 1: Roger Federer gets ready to serve the ball to his hologram at the 2015 US Open
Use Case #2: Train Employees

Immersive technology has proven to be an effective way to train employees on using new products, interacting with customers and responding to situations. It gives employees as close to a real-life experience as possible, without having to bear the costs of mistakes. And it’s also a faster and more compelling way to teach than handing out manuals or offering the information in a presentation, since people can learn by doing, rather than reading.

Recommended Tech: Mixed, Virtual Reality

Although all types of immersive technologies can be used to train employees, MR and VR are particularly well suited since they allow users to interact with, rather than just view, the projected images they see. Doctors at Cleveland Clinic, for example, used Microsoft’s HoloLens to teach surgery and anatomy. Students used their hands to manipulate the projected human bodies and parts they see in their goggles. The recall and performance of these students was much better than those using only two-dimensional training materials, such as textbooks and videos.

In some cases, it’s cheaper to simulate and control the entire training environment using VR, rather than project it onto a real environment like we do in MR. For example, a leading airline decided to train its technical operations team using virtual reality headsets because it was cheaper than getting access to a real aircraft.

Figure 2: Medical students can view and interacts with a 3D image of the human body through Microsoft’s Hololens
Walmart partnered with VR training company STRIVR to create a virtual reality training program at all 200 of its training academies across the country. Using Oculus Rift headsets, the virtual program trains new employees on three types of situations: special events such as Black Friday, customer service protocols, and logistical best practices such as re-stocking shelves and storage.

In each training session, trainees’ headsets are hooked up to a large screen so the rest of the classroom can see what they are seeing, while a teacher critiques their actions. In addition, the headset records the eye-movements of the trainees, giving valuable feedback to the program creators about how the users are engaging with the content. As a result, 70 percent of trainees who used VR did better on their learning evaluation exams versus those who didn’t. The VR trainees also reported a 30 percent increase in overall training satisfaction, compared to the non-VR trainees.

Figure 3: A Walmart employee undergoing situational training using a VR headset
Use Case #3: Test And Learn Customer Needs And Preferences

Companies that make large or complex products often run into problems when they want to test their prototypes with real consumers. It can be too expensive or logistically difficult to transport prototypes to a place where there are enough testers to provide credible results. By letting testers interact with a virtual prototype of a product instead of the real thing, companies can get early insight into consumer preferences, design issues and usage.

**Recommended Tech: Augmented, Mixed, Virtual Reality**

Although AR, MR and VR are all good choices for this use case, MR and VR have the added advantage of being able to track eye and hand movements of the users as they interact with the product. This gives brands an additional layer of insight as they can analyze in real-time how users are responding to visual stimuli, which is more accurate than asking them to recall their responses to the product after the experience.
Organic baby food manufacturer Happy Family used VR to figure out the best way to stock their products in retail stores. Partnering with VR experiences company InContext Solutions, Happy Family created a realistic shopping experience where customers could browse virtual shelves stocked with baby food, pick up products and read their labels, and finally place them in a virtual shopping cart. Customers navigated the virtual food aisle projected on a large screen by controlling their actions with a mouse and special controller.

This shopping simulation allowed Happy Family to virtually test several different product layouts on a large number of consumers in a cost effective way. Over 200 baby food purchasers generated 800 responses, giving Happy Family valuable insights into consumer behavior and optimal shelf configuration. For example, they found that reducing the number of brands on the shelf got more positive responses from consumers, and taking up more space on a shelf improved consumer confidence in that brand.

Remarkably, setting up the entire test took only three and a half months from the time the initial idea was conceived to the day the first virtual test was conducted, further highlighting the speed and effectiveness of using virtual tech to gain real-world insights.

Figure 4: A virtual shopping aisle created to test shoppers of Happy Family baby foods
Use Case #4: Build Customer Trust And Confidence In The Product

Immersive technologies offer companies a great way to demonstrate the value of their product to customers who might be skeptical. They are especially useful for companies whose products are likely to elicit buyer’s remorse, for example, luxury cars, large appliances or furniture. Since these products are not easily purchased-- and cannot be easily returned either--buying cycles are very long and consumers often have a great deal of anxiety about purchasing them.

Enter immersive tech. By demonstrating exactly how a product works or what it actually looks like, these technologies help companies overcome consumer doubt. For example, IKEA’s AR app allows customers to “place” a 3D image of a piece of furniture within their room to see what it looks like before they buy it.

**Recommended Tech:** Augmented, Mixed, Virtual Reality

The decision to choose between AR, MR and VR for this use case comes down to the type of product a company is selling and the cost of setting up a demo. For manufactured goods or products that involve quick buying decisions, AR is a better choice for a demo. Not only is it more accessible and cheaper to build, it can also quickly convey the physical or spatial features of a product (e.g. furniture, real estate). For brands more focused on selling experience and emotion (e.g., hotels, amusement parks, movies), VR and MR are better investments since interactivity and deeper immersion are more likely to generate positive emotional responses compared to 2D video or less immersive experiences.
Hardware and home improvement retailer Lowe’s partnered with Microsoft HoloLens to create a mixed reality experience that helped customers visualize what a home renovation project would look like. Customers wearing the HoloLens headset could stand in a Lowe’s kitchen showroom and use simple hand gestures to superimpose different options on the real objects they were considering. For example, customers were able to “try” various colors, sizes or textures for cabinetry, hardware, counter tops, and appliances. They could also instantly view the price for any option they chose to try.

For Lowe’s customers, the HoloLens mixed reality experience helped take the guesswork out of a renovation project and gave them the ability to visualize the options they had to choose from. By providing this experience, Lowe’s removed one of the biggest obstacles to buying their products: the fear that it could all turn out wrong.

Figure 5: A Lowe’s customer viewing a virtual kitchen with features being customized in real-time by an employee
Use Case #5: Bring People Together

Companies that want to extend the reach of their events, bring communities of customers together to discuss products or tips, or foster greater communication between their employees can benefit greatly from immersive technologies. For example, a large, global organization might be able to bring together several teams from different countries in a simulation that feels as close to an in-person meeting as possible. Or a company might be able to allow customers to virtually experience a live event they aren’t able to physically attend (think of sold out musical concerts).

**Recommended tech: Virtual Reality**

Since VR has the ability to “transport” users to a three-dimensional simulation where people can connect with each other as if they were in the same physical space, it is particularly well suited for this use case.
VR-based communication is a natural progression for Facebook, a company whose entire mission is to facilitate social connections. The social media giant is developing compelling ways for users to connect with each other using VR headsets, interacting in environments far removed from their current realities.

To prove the positive emotional and social impact of VR-based interactions, Facebook commissioned a study that observed 60 participants aged 18 to 51 who took part in one-on-one virtual conversations while wearing an Oculus Rift VR headset. Each “VR conversation” took place in an environment that resembled a train cabin, where participants interacted with virtual avatars of each other. The participants had EEG sensors record their brain signals and monitor their levels of comfort and engagement.

The study found that most participants had overwhelmingly positive emotions during these virtual interactions, which, they found got easier and more positive over time. These results were especially true for people who identified themselves as introverts. Participants also noted that they felt comfortable revealing personal details about themselves and believed that VR reduced appearance-based judgments.

“It was a lot deeper, and enjoyable, and closer to life than I expected,” said one 43-year-old male participant. “We moved from two strangers having the same (superficial) conversation to two humans revealing themselves and their experience of life.”

Figure 6: Strangers meeting and talking to each other in a virtual room using Facebook’s Oculus Rift VR headsets
Getting Started: First Steps For Incorporating Immersive Technologies Into Your Strategy

As you begin to consider incorporating immersive tech into your business strategy, we’ve compiled a list of initial steps that will help you fully capitalize on it and adapt to its continued evolution.

**Decide what you will use it for:** The best way to choose a use case for immersive tech is to have a deep understanding of your customer and employee needs. Create a data-proven ranking of your customers; or employees’ biggest pain points and see where immersive technology could make the biggest impact.

“Every application we create is rooted in solving a big ticket customer problem,” says Josh Shabtai, director of lab productions at Lowe’s Innovation Labs. “We never looked at AR/VR as simply an area we had to go after; we looked at how we could help out customers better visualize their homes and their lives in their homes.”

Immersive technology is at its most compelling when it is used to make a process easier, describe a situation better, or enhance positive feelings. And when it is used to make something unimaginable close to possible--then it transcends into a truly special experience.
Visualize outcomes to secure executive support: The best way to sell a new technology to skeptics and naysayers within a company is to paint a picture of its potential success. That is quite literally, what Lowe’s Innovation Labs did, when it first had the idea to deploy a mixed reality experience for visualizing home renovation.

The Lab created a comic book that told the story of a young couple who couldn’t agree on how to redecorate their kitchen. The couple then walks into a Lowe’s showroom, where they both wear VR goggles to visualize and discuss their new kitchen, and walk out in harmonious agreement.

Lowe’s eventually brought this comic book vision to life several years later when they partnered with HoloLens. The compelling imagery of the idea—and what it would look like if it worked—was instrumental in securing executive support and aligning stakeholders to a common goal.

Assign an internal champion: As with any new technology, an internal champion is essential for the successful implementation of immersive technology. This internal champion should be the person who has the vision for what the AR/MR/VR application will look like. Ideally, he or she is also passionate about emerging technology and has the eye and support of the C-suite.

According to Juan Sotelo, chief operating officer at VR payments company Payscout, having an internal champion isn’t just crucial for implementation. The champion is the single point of communication for all immersive technology-related vendors working for the company. “If you don’t have one, you’re going to be outsourcing a lot of information that should be held more internally,” Sotelo says. “In addition, you are going to communicate more effectively because you will be speaking the same language to vendors and be capable of translating value internally.”

Imagine the impossible: Merely replicating real-world experiences isn’t a very compelling use case for immersive technology. Many companies who want to get started in AR or VR make the mistake of only creating simple experiences which are quantifiably worse—or less convenient—than their real-life equivalent.

For example, a company might try to create a virtual reality shopping experience that looks like a virtual brick-and-mortar store. While shopping in this simulation might be more convenient for a customer who doesn’t want to physically visit the store, it is probably not very compelling. But what if the virtual store were located on the surface of the moon? Or the clothes were floating in zero-gravity? This kind of creativity is what makes virtual experiences worth choosing over real-life experiences.

Companies merely looking to replicate what already exists in real life, or to simply solve a matter of convenience, aren’t exploring the full, exciting potential of immersive technologies.
Get your 3D assets together: On a more practical level, it’s a good idea to locate, gather and centralize all your company’s 3D creative assets (AutoCAD files for example) in an easily accessible repository. This makes it a lot easier for vendors who are tasked with creating immersive experiences for your company. “Every company has 3D models of their product somewhere, but finding them can be really hard sometimes,” says Ashley Crowder, CEO of VNTANA. “It can keep costs lower if you can organize your 3D assets, or at least know who to ask and where to find them.”

Plan for interoperability: An immersive technology, is, ultimately, a digital channel that records customer interaction data. To continue delivering a unified customer experience across all channels of engagement, companies must merge the data generated from AR/MR/VR devices with traditional customer data systems, such as web analytics or CRMs. Some immersive technology vendors will build this integration along with the simulated content—but other times it might have to be custom-built by your company’s own IT department.

Not only does the integrated data flow help recognize customer preferences across all channels, it helps align all the different stakeholders within the company on the goals and expectations of the immersive technology.

Endnotes


ECOSYSTEM INPUT

This report could not have been produced without the generous input from the following people (input into this document does not represent a complete endorsement of the report by them):

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ABOUT US

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As an analyst for Altimeter, Omar publishes research that helps companies thrive on digital disruption. His areas of focus include content strategy, digital marketing and marketing technology. These research reports include industry benchmarks, maturity models, guides for developing strategies, and frameworks for evaluating people, processes and tools.

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ABOUT ALTIMETER, A PROPHET COMPANY

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