VR VISION

Lessons Learned Developing Custom **VR/AR Solutions for Corporate Training**

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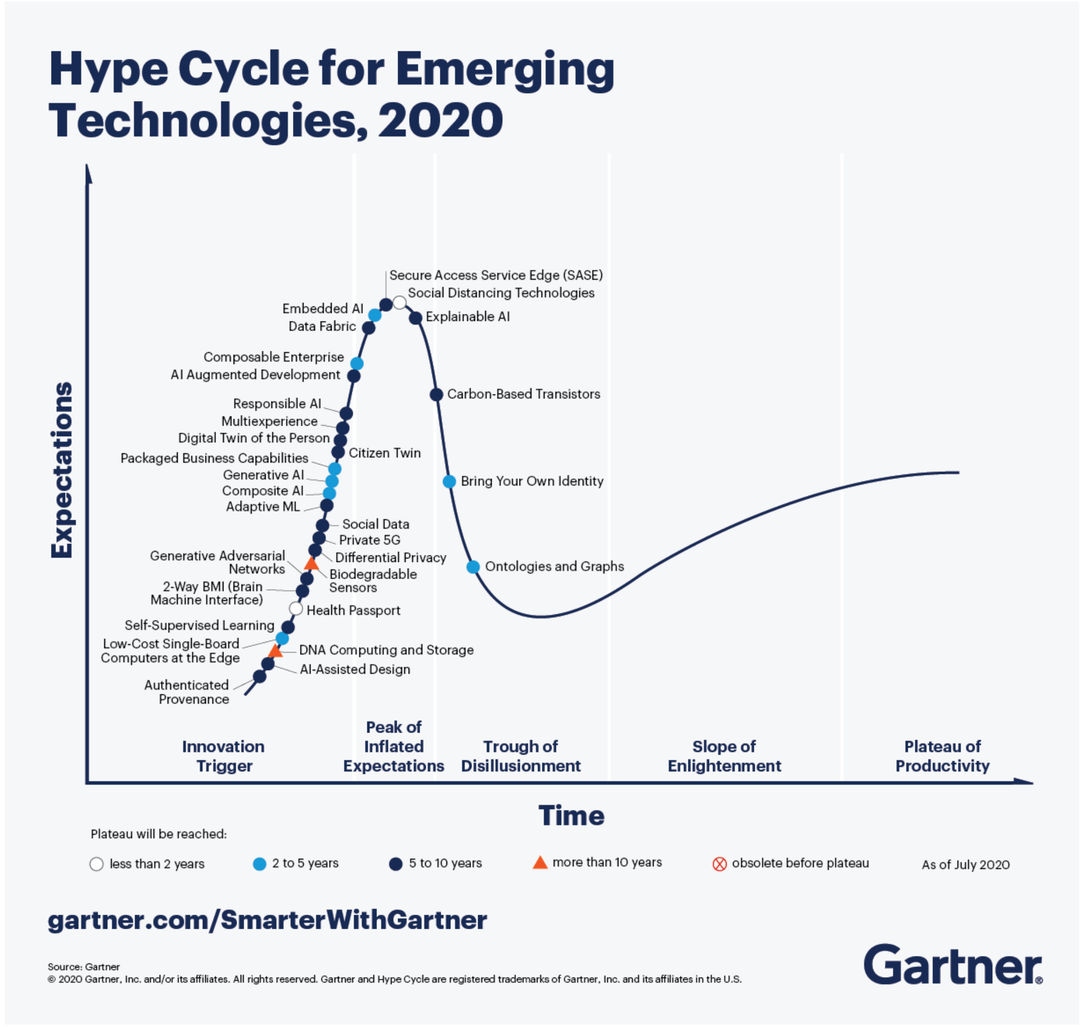
Introduction

The top three challenges for learning and development leaders are Engaging Learners, Knowledge Transfer and The Delivery of Consistent Training.

An effective way to tackle the above is to innovate and adopt new technologies. With XR out of the Gartner Hype Cycle in 2020 and categorized as a mature technology it has become clear that the organizations who were early adopters gained a clear competitive advantage and were able to tackle the above challenges with unprecedented efficiency.

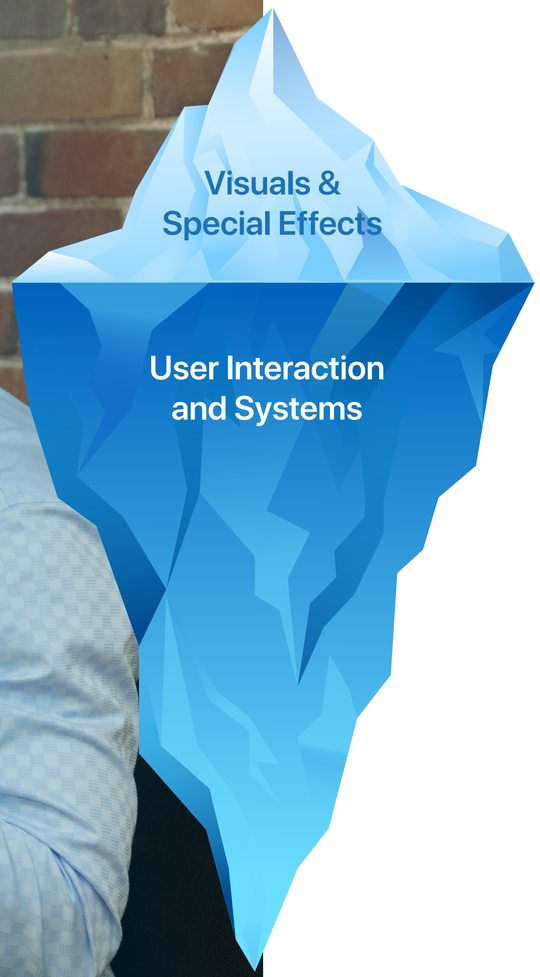
Content that was typically delivered passively through manuals and video and in rare occasions via interactive web based guides was soon disrupted by fully immersive VR training or real time guided workflows in AR.

Even though ultimately successful these organizations and early development partners like VR Vision, learned a multitude of lessons that ultimately made for faster and smoother deployment of this technology. In this white paper we hope to share with you some of these lessons that will hopefully help make your adoption of the technology easier and more successful.



Deploying Successful XR (VR/AR) Training

Immersive technology even though in it's relative infancy has proven some truly ground-breaking returns for enterprise training. This success and level of organizational-wide application have also caused unintentional failures in deployment.



Depth Instead of Breadth

One of the main reasons for failure has to do with how immersive technology content is created and delivered. Traditional software has over the past 30+ years matured to become hyper-specialized based on their respective industries. We take for granted how sophisticated these systems have become and few people remember the early days of early custom-developed applications. Immersive (VR/AR) technologies today are in similar territory.

Because so much of the content is customized and often designed for the first time, the best way to ensure success is to keep it focused and grounded on a single in-depth use case. The benefit to this is that early adopters are often the ones driving the foundation of this system, which innately have their foundation designed by the early adopters.

The drawback is that businesses adopting the technology should only move in calculated and well-planned design stages. Taking a phased and in-depth application design approach ensures that what is delivered works very well for that business need, less capital is spent before ROI is measured and a foundation is set for future growth. This many times begins with a pilot program in order to assess the value and ROI of using immersive technology for training.

Enterprise-Wide Success

When looking to expand or enter the immersive technology space it's advisable to plan beyond its immediate use-case. Using VR/AR technology for a single-use case is not dissimilar to using your smartphone to only send/receive a text or our laptop for just powerpoint presentations, no matter how well thought out the transitions may be.

At first glance, the title of this section may seem to contradict the previous one because we are now advising for breadth. Not quite the case, the focus on depth is mostly related to custom developed content. Often, the hardware will provide other out of the box applications that can be used across different business units. For example, with RealWear, we have created some very specific step-by-step guided training scenarios, but the devices themselves allow for incredibly useful collaboration tools that should not be ignored.

Device Management & Implementation

Another paramount consideration when looking to implement new technologies like augmented and virtual reality will be the device management internally. Many companies will have restricted networks and adding new hardware to their network will often undergo scrutiny from IT teams. When adopting new technology it should be discussed how maintenance and support will be provided upon implementation.

Integration With Existing Infrastructure

It is important to consider how your VR application will exist in your existing software infrastructure. This could include Learning Management Systems (LMS), Customer Relationship Management Software (CRM), data security compliance and network security requirements. These topics fall outside of the typical content development cycle, but they're an important consideration in order to choose a vendor who can provide a solution which fulfils requirements from all sides.

Kiosk Mode

Single App loading
Multi App library
Lockdown

Console

Company User Rights
Groups
Tags
Operator assignment

App Control

Push and Pull
Uninstall
Update
Real Time Usage

Device data

Battery Status
IP Address
WIFI Name
Usage data log
Memory & storage usage

Advanced Security

Geo lockdown*
Remote device data wipe
Location tracking*

Integration With Existing Infrastructure

When you're looking at VR training, you can consider it to be an app based form of e-learning.The learning activities created in VR can be tracked in a LMS and they can also be part of a larger course. These courses follow SCORM or xAPI compliance, so that it will fit nicely with your existing course structure with the same enrollment process as a typical course. This makes things easy for your trainers, using the same process they're used to and not having to reinvent the wheel. The relationship between the VR training and the LMS is symbiotic, as the insights gained from the data collection systems in the LMS allow for further understanding of the quality of the VR courses, identify bottlenecks and establish performance benchmarks.

There is also an option of pulling employee records in order to use their info for advanced features in VR. This can include automatically assigning a trainees name in multiplayer experience, for a huge boost in user experience and multiplayer communication capabilities. Lastly, it facilitates the collection demographic information for your custom dashboards, which we'll discuss in the next section.

CRM Integration

Under circumstances where customers or distributors are using VR training to learn about a company's products, there is an opportunity to gain insights through integrating with CRM software. It facilitates regional comparisons of product knowledge and specific product interest, which is complementary to parallel digital campaigns. These metrics can also guide outbound sales initiatives and marketing campaigns with further understanding of specific clients, which roles in their organization show the most interest and which location they're based out of. The activities can also be linked to buying behaviors, to create a more predictive sales process, if you see a specific team in an organization focused on learning about a specific suite of products.

Data Analytics & Visualization for Business Intelligence

In order to take full advantage of the capabilities of VR and to utilize the data collected, there are two integral components in addition to the integrations mentioned above. A custom analytics dashboard and an API to access training records at will.

The custom dashboards allow deep insights with benefits such as benchmarking, and productivity prediction to be used in your overall business intelligence data. We typically categorize our metrics into 4 main buckets:

Usage

data related to how many users are using the application, this can include new registrations, active users and average session duration. This is important to measure employee engagement and customer traffic.

Demographic

data related to the people using the app, where are they using the VR, where are they based out of, how old are they and gender. This is important for better understanding who is using your application and why.

Training Overview

This gives a snapshot of the learning activities taking place throughout all of the available training modules. This can include average scores, completion status, average time to complete, amounts of employees completed specific modules etc.

Training Details

This data relates to the finer details of each module, such as how long they're taking to complete specific tasks, how many mistakes they made, missed tasks, failed tasks etc.

To bring this to the next level, an API for organizations to access their employee records from VR is integral for the data to be utilized. With this API your existing BI infrastructure can ingest this data, allowing for enhanced data comparisons and more accurate measurements of your KPIs.

Utilize Internal Resources

It's important to find a trusted service provider who has in-depth industry experience to help your organization on its journey to successfully adopting immersive technology. Many times larger organizations will have someone or even teams in an XR capacity in order to test out the usage of the technology. You may be that person reading this whitepaper -- the key is to ensure that the training program has widespread use.

We developed an ROI calculator tool to help enterprises measure the impact of VR training organization-wide, you can check it out here:

Try ROI Calculator Now

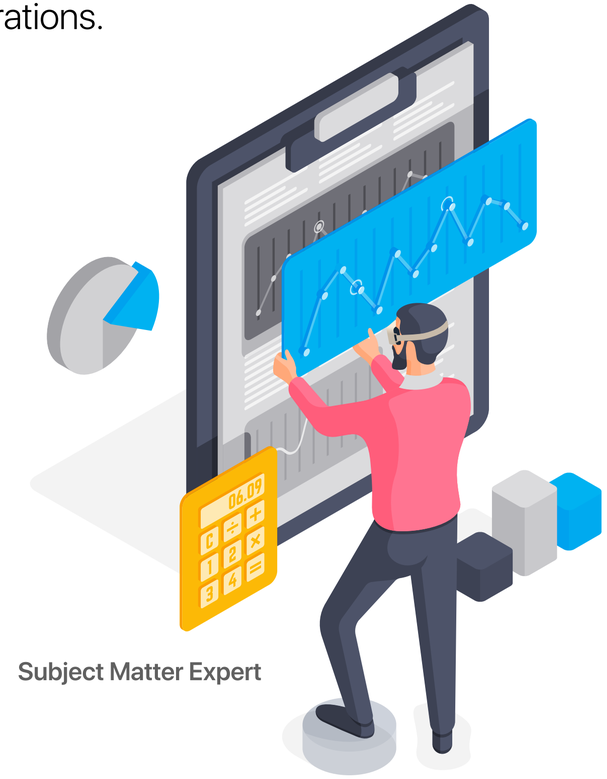
That said, a strategic partner is the only one who is willing and encourages collaboration. There are two types of internal resources who in our experience provide the most value. They aid to both increase the quality of applications created, assist in integrations, as well as reduce the cost of outsourcing development.

Subject Matter Expert:

This is perhaps the most important component to ensuring that the VR/AR applications are a perfect fit and meet the true needs of the end-users. Their time commitment is minimal but critical. They are usually more engaged in the early planning and final validation stages of the project.

IT Specialist:

In order for a smooth integration and data collection process, an IT specialist should be involved early in the project, or even before the project kicks off. This ensures their team is aware of the new initiative and has time to prepare the essential resources. The typical resources to be provided are network security details, data security compliance information, configuration requirements for software systems and sandbox environments for integrations.



Lessons On Virtual Reality Training

It's important to consider the kind of training application you are looking to have created in order to find the best fit for implementing technology. There are two main ways to deploy training applications in VR, one is through 360-video based content and the other is by developing custom CG-based graphical content.

Hard Skill Training

Using virtual reality for training doesn't always fit the process that is looking to improve. C-level (CIO/CLO's) executives and business leaders need to be cognizant and think strategically about how the learning outcomes will be developed and then implemented company-wide. Many times soft skill training needs to administer a lifelike interaction to be effective. This is where CG (Computer Generated Graphics) and virtual reality combine to produce effective learning results.

Imagine you are a nuclear plant operator or technician, and you have learned typically from manuals and outdated web-based videos traditionally. Moving to a virtual reality-based learning system would require a lot of interaction and hands-on movements to elicit a valuable learning outcome. Using computer-generated graphics and a simulated 3D environment that is a 1 to 1 replication of nuclear reactor operation can allow a newly trained technician the ability to interact and manipulate any kind of learning process as if they were working in the field live.

This has a tremendous impact on the way safety is taught as well as for risk mitigation. You would much rather have that newly trained employee make mistakes on the "virtual reactor" than the live one. And these kinds of scenarios have applications across a wide array of industries where hands-on training is necessary but also carries a significant amount of risk or hazard.

Soft Skill Training

On the opposite spectrum, we have soft skill training methods. These are the kind of roles where learning outcomes require much less interaction but are still necessary to be educated on. Many times, a soft skill training scenario will be mapped out and then replayed similarly to watching a movie. The benefit of using virtual reality for this kind of learning method is that it immerses the learner in a virtual world that is distraction-free and provides a much more lifelike visual of that specific scenario.

A great example that is currently being used by several of our clients involves mock scenarios of various kinds of disgruntled customers that a bank teller would interact with during a typical workday. A specific scene is directed and filmed using 360 cameras to capture an entire production playthrough of an outcome for training. An angry customer begins belittling or yelling at the bank teller, and then the trainee is tasked with various options in a "choose your own adventure" or multiple-choice format to gauge if they would handle the scenario correctly.

Using immersive technology, specifically virtual reality, for this kind of mock scenario can prove to be extremely beneficial for trainees but also for learning and development leaders looking to improve onboarding efficiency and reducing costs for training. VR environments are much more memorable and offer a uniquely interactive way that engages learning like never before. The scenarios, once fleshed out, can be replayed infinitely and offer trainees the ability to go back and re-engage learning outcomes much more effectively.

Another great example of using 360 video content is any kind of process that can easily be watched and mimicked or that has easy replayability. This allows the trainee to watch an immersive training video and then have the ability to try to replicate through watching and learning.

Lessons On Augmented Reality Training

When looking to adopt AR-based training solutions, companies need to be aware of the different types of hardware deployments available as well as the best fit for usage with each means of hardware. With both mobile AR and Wearable AR, there are benefits and disadvantages to each, which we will cover below

Wearable AR

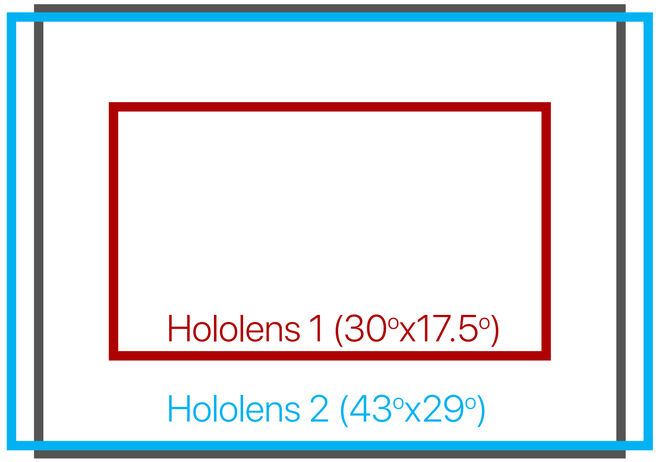
There are three major players currently in the wearable AR market (four if you count Google Glass). There is the Microsoft Hololens, The MagicLeap 1, and relative newcomer to the enterprise market, RealWear with their HMT-1Z1. Each device has their merits and disadvantages of which we will cover below.

Microsoft Hololens

RealWear

The MagicLeap 1

The Microsoft Hololens provides perhaps the most robust platform for training solutions as it has been the longest standing wearable AR device on the market. The Hololens 2 is the current iteration and it provides ample viewing space for collaboration in AR environments. You can see the FOV compared in the graphic below:



While both Hololens and MagicLeap are more of an immersive wearable experience, the Realwear headset is different in that it works as a smaller picture-in-picture style of AR that is less intrusive and more for ruggedized and industrial applications.

RealWear - HMT-1 & HMT-1Z1

Focused on Advanced In-Situation Training in rugged and potentially dangerous, real-world environments.

(Real-world focus first, digital focus second.)

Microsoft - Hololens 2

Focused on Basic Digital Training in safe environments, contextualized in the real world.

(Digital focus first, real-world focus second.)

Mobile AR

Mobile AR is using a mobile device like a cellular phone or a tablet to overlay CG-based graphics on top of the real world using the device's camera. Think of Snapchat's filters where, with the flick of a finger, you can take dog-eared selfies or swap faces with your friends. However, mobile AR isn't just for fun photos, it can be used brilliantly in mobile marketing to boost engagement and create realistic, virtual experiences with products.

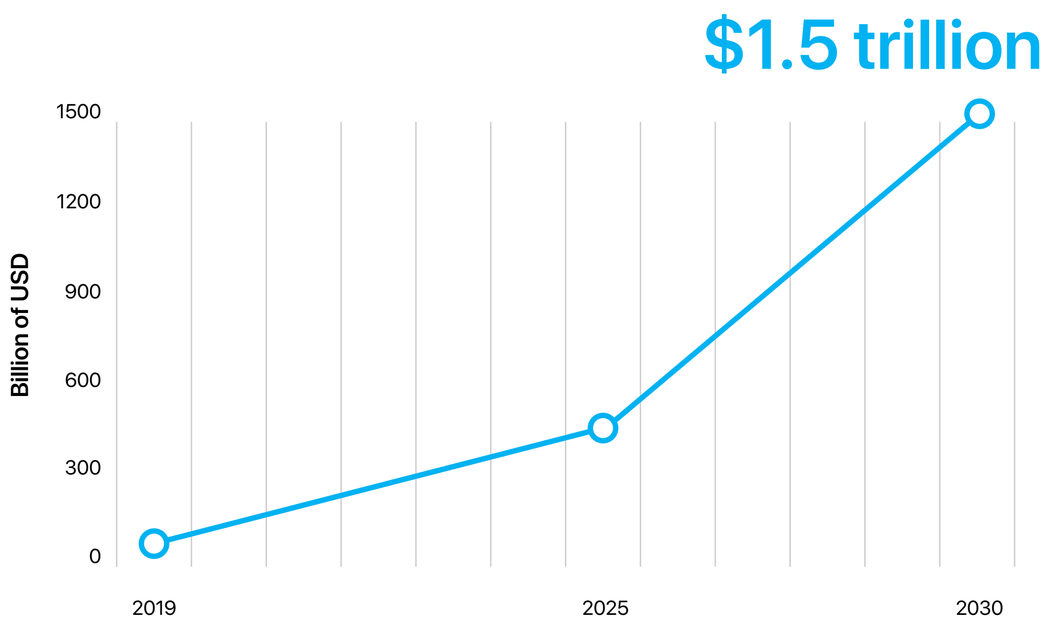
Apps like IKEA Place allow shoppers to virtually see how a couch or lamp would look anywhere in their home so they can make sure it fits their space and aesthetic before they purchase.

For complex manufacturing scenarios, factory workers trial equipment maintenance using AR, without any real risk. For example, to increase the efficiency of installing its devices, Cisco ordered a customized AR app to let technicians launch virtual demonstrations straight from the devices.

A Look to the Future

According to a recent repower by PWC, Development and Training has the potential to boost Global GDP by $294.2 billion (By 2030) while VR/AR in total is forecasted to add more than $1.5 trillion. This is because we now have conclusive evidence that VR and AR in training boosts engagement and knowledge retention as well as enabling enterprises to enforce consistent, measurable standards at scale. The technology also provides a way to train employees where it is not always practical or safe to do so in the real world.

VR and AR have the potential to boost GPR glabally by 2030 by up to $1.5 trillion



Bringing It All Together

Now that you have an understanding of the different types of use cases for VR/AR technology, you may be wondering what the best next step is for adopting each specific technology. It all comes down to ROI for a lot of companies, that is, choosing the best use case where therein lies difficulty for training and/or scaling. A lot of times immersive training programs have a great fit for roles in which there is high turnover or a steady need for consistent learning.

If you have outdated training programs that could use a refresher, XR can be a useful tool to bring things into the 21st century as well. Lastly if you have trainers that have limited availability, it is useful to use them in a virtual environment that can be scaled and repeated without strain on them to be present all the time.

Every company is different and these decisions are part of the iterative process in deciding to develop an immersive training program or module. You will have to look internally and see where there is a definitive need and then brainstorm with our immersive content specialists to figure out where the best fit would be.