

# The State of VR in 2017

Virtual Perceptions



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Statistics and further information are correct as of February 2017.

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**The below are the definitions used for this report:**

**Immersive Reality**

*The umbrella term which encompasses all immersive technology within the industry. (VR, AR, MR)*

**Virtual Reality (VR)**

*The computer-generated simulation of a 3D image / environment that can be interacted with. (Resident Evil 7, Robinson: The Journey)*

**Augmented Reality (AR)**

*A technology that superimposes a computer-generated image on a user's view of the real world, like through a mobile phone, thus providing a composite view. (Pokemon Go)*

**Mixed reality (MR)**

*The merging of real and virtual worlds to produce new environments and visualizations where physical and digital objects co-exist and interact in real time. (Head-up display, holograms)*

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## Introduction: 'The Immersive Reality Revolution'

'Virtual reality' has become a catch-all term in the last few years used to define anything vaguely related to the technology, often not matching strict definitions. Casual individuals interested in the emerging industry would not type 'mixed reality,' or the 'business applications of augmented reality'. They would be searching for virtual reality – to the point where many people believe that Facebook's 360-degree videos and true VR are one and the same. To the casual browser, 'virtual reality' is the umbrella term for everything.

Brands and companies are aware of this, with many labelling their experiences and applications as 'VR' even though they do not fall under the same category. Even the title of this report, 'The State of VR in 2017,' is somewhat inaccurate – the focus is far broader and less constrained than what it implies. Yet the kind of people who would be into the tech would be using the term 'VR' to find relevant content. The title is intentional to rope in the exact kind of people who would enjoy the information in this report.

And that is exactly my purpose – to show how VR is so, so much more than what most would expect.

This report depicts the sheer breadth of technology: holoportals to upload holograms of yourself; builders using augmented reality to guide their work; interactive sweet shops which glow and shriek with a participant's interaction. All the tech has been building up and developing for decades, but ever since 2014 this trend has accelerated, and all the technology being used is so multi

varied that 'VR' is an inadequate term for the revolution.

My proposal is not a paradigm shift – many professionals have been using the term I will describe for some time. But it should be emphasised yet again by the wealth of case studies presented in this report.

There must be a new umbrella term for the revolution we are experiencing today. One which captures the multi-varied bits and pieces of technology cropping up on a weekly basis. One which can be used in a decade's time, looking back at the 'wild west' of emerging technology as label for the period. One which isn't as constrained as the definition of VR.

I propose that we are experiencing an 'immersive reality revolution,' and one which will greatly shape innumerable industries in the future.

This report will show you some of the most exciting applications of immersive reality tech, from engineering to gaming to medical practices. I hope you enjoy reading it as much as I enjoyed researching the topic.

**Thomas Ffiske**  
**Editor**  
**Virtual Perceptions**





## 2016 – What Happened?

2016 saw several headsets come out to a brave new world, when expectant consumers with the cash and space were able to try the tech for the first time. The PSVR did particularly well, shifting hardware for expectant PS4 players to play with. Many commentators in 2015 stated that 2016 was the “Year of VR.” In retrospect, it makes better sense to say that 2016 was the year VR made a few visible swings in the consumer space, while the invisible movements in the business underbelly kept strolling.

Last year saw some exciting steps forward in the world of VR storytelling. Despite only a handful of narrative pieces being released commercially, the industry learned a great deal. We saw the first longer-form productions released, such as Ctrl from Breaking Fourth, and Allumette from Penrose Studios, proving that audiences are ready for more substantial stories. VR cinemas and arcades also made their debut this year taking VR films to new audiences around the globe. As VR film starts to move away from short, experimental pieces towards more mature and challenging productions, I hope to see many more people take up VR as the new entertainment medium.

Yet the technology is not perfect. Some developers find it difficult to minimise motion sickness, while the software can be of poor quality. Stand-out titles did appear, but they were relatively few in number. The overall consensus across commenters were still positive, yet aware that the technology was not picked up as well as they would have liked.

Jeremy Dalton, VR/AR Lead at PwC, argues that all of these kinks will be solved in the coming generations of VR, though calling any year 'the year of VR' is a misnomer: “Ultimately, high quality VR experiences are the differentiator in this medium and they are still in short supply and too expensive for the average consumer.” Quality, in this case, will be explored in the chapter on social VR.

### Key statistics of 2016:

**Sales** - SuperData Research offers estimates that **6.3 million VR headsets** were shipped in the whole of 2016. Of these numbers, **4.5 million Gear VRs** were sold through last year, and Playstation VR “**approached a million**” by the end of 2016.\*

**Investment** - Digi-Captial estimates that **\$2.3 billion** was invested in VR/AR through 2016, **three times that of last year**. Investors include Alibaba, Warner Bros, Google, Qualcomm, Fidelity, J.P. Morgan, Morgan Stanley, T.Rowe Price, Wellington, CIC, Intel, Amazon, Fidelity, CITIC, NetEase, Softbank, 21st Century Fox, MGM, Lenovo, Tencent, Comcast, Samsung, and HTC.\*\*

\*SuperData Research and Unity, “Can’t Stop, Won’t Stop: the 2016 Mobile Games Market Report” (Feb, 2017)

\*\*Digi-Captial, “Augmented/Virtual Reality Report 2017” (Feb, 2017)

## 2016 and the lack of female representation in VR

In various events through 2016, many noticed a great gulf in the representation of women in conferences. In an industry where talented women work tirelessly to provide quality work, a board of white males masks their impact. Though not the case in many places – such as VRWC – and while the industry itself is diverse, its representation is sometimes not.

Nina Salomons, Filmmaker at Jellybee-films, is passionate about the gender divide: “Women are fighting an age-old patriarchy, wherein they come second to man. Look at Silicon Valley, Gaming, Film and TV. Most men also take bigger risks and start their own start-up companies, whereas women often take supporting roles within them.

“A huge gender gap exists within these fields, which naturally translates to new technologies such as VR. [These fields] are dominated by men, and instead of thinking about equal gender representation at conferences, they just want somebody talking about VR – they want experts. Those expert roles are often not given to women, especially in the tech start-up world.”

Nina raises excellent points. The patriarchy is a strong element across many segments of society, and generations upon generations of societal norms crush the hopes of many aspiring females who rise up. It is hard to tackle a young industry when it is bagged by centuries of

silent sexism – it is never intentional, but it is apparent. Yet the tech world is changing, with many initiatives designed to increase the acceptance and progression of women working in technology – we will come to one example later.

Instead of thinking about equal gender representation at conferences, they just want somebody talking about VR – they want experts. And sometimes – not all the time, but sometimes – those expert roles are not given to women.

Nina was not the only person who was passionate about the topic. VR / AR World took place on the same day and, again, there were few female speakers who took the stage. Catherine Allen, VR Producer for the BBC, had a few thoughts on why this may be:

“VR and AR conferences tend to be pretty male-heavy, especially when they are hardware or software related, rather than content centric. This is a shame. The reason why it is this way, I am assuming, is because VR is still in its early stages, and perceived as derivative of other industries, rather than as a distinct industry and communication medium in its own right.

“VR offers us a fresh start. As a society, we don’t need to bring the baggage of the past with us – all those assumptions, unconscious bias and the default male perspective. If we are conscious, now, that it can be different, and strive for diversity in every part of the VR process, we can make a huge difference, not only from a career opportunity perspective,





but also in terms of the change we can foster in society as a whole.”

The key word Catherine highlights here is ‘unconscious bias.’ These organisers are not deliberately selecting men over women out of conscious choice – such outright displays of sexism are now very rare. But these divides do unconsciously happen, and though harder to detect, they happen everywhere.

There are many groups out there who are seeking to reverse the bias across the industry. Catherine is one such person, and another is Luciana Carvalho Se, a Chief Evangelist who organises the UK meetups for UNFOLD. It isn’t just restricted to women – the group helps those of differing ethnic backgrounds and sexual orientations in the industry develop and get noticed as well. In particular, they are developing a directory where thought-leaders can be more easily found and contacted.

Luciana is hopeful for the industry: “I do think there is a group of women paving the way for greater female representation – and doing so in a way that is more collaborative, welcoming, supportive than any other tech vertical I’ve seen. Nonny de la Pena (the “godmother of VR”), Helen Situ, Julie Young, Jenn Duong and in the UK, Sarah Jones, Tanya Laird, Sammy Kingston among many of the amazing women I have the pleasure of sharing WIVR and UNFOLD meetups with, are all, in their unique way, beating the drum for female involvement & making sure that VR/AR has a female voice.”

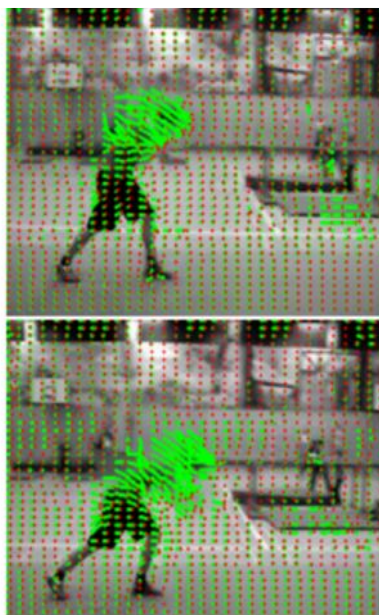
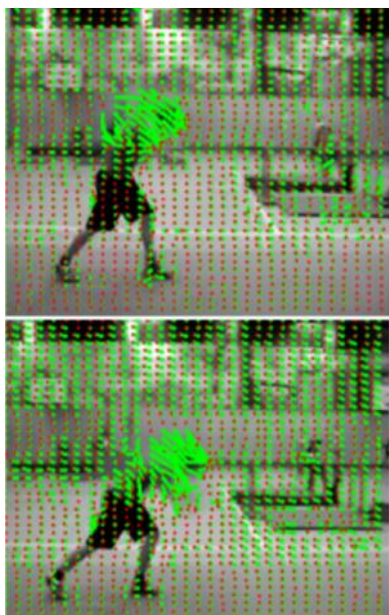
At the heart of all these issues, Luciana believes that the solution is through teaching others: “There are so many

cultural-social shifts we need to take place, and I think one of the most important ways we can do that is through education, and confront stereotypes about women in tech/VR with campaigns like #heforshe and #Ilooklikean-engineer... But then again we are talking about inclusion, not just diversity – we are talking about talent and equal opportunity, not just diversity for diversity’s sake.”

After years of built-up sexism which manifests as unconscious bias, followed by the number of men who work in the industry, it is important to make sure industry practitioners are educated on the great women who work alongside them. As Luciana states it is not ‘diversity for diversity’s sake’; it is vital to highlight the strong figures that have always played an influential role for the last few years.

**UNFOLD** is a networking and advocacy organisation with a mission of increasing diversity (LGBT, women, ethnic background) in virtual reality, as well as attracting more people to the field. They will soon host a directory for people to find people working in the industry.

To support the organisation, please visit: [unfolduk.org](https://unfolduk.org)



**Jaunt** provides the most comprehensive overview of VR production publicly available, and I highly recommend it to all VR creatives.

To read more, take a look at "The Cinematic VR Field Guide" (Jan, 2017)

## Technology being used in VR

No creative is complete without its tools, and very few things are more interesting than the tech capturing footage of immersive reality.

For example, many cameras are capable of creating up to a 12k resolution image, though working with this size image with today's technology is quite impractical. Yet a large file size is necessary to capture as much data as possible, utilising multiple cameras and angles to gather enough footage for compositing, editing, colour correction and CGI. Given this, Jaunt has currently limited the resolution we output to 3840 x 3840 stacked left/right eye equirectangular stereo 3D at 60fps.

Beyond this, another issue is the resolution of the headset, which currently supports around 1K per eye. This is satisfactory, but not the highest quality possible for now. With greater quality in images come crisper, more immersive visuals.

Another cool technical concept is Optical Flow, illustrated above. This is a technique that has several applications including motion estimation, tracking and camera creation, matte creation, and stereo disparity generation. At its core, optical flow algorithms calculate the movement of every pixel in a scene usually across frames in a time based analysis from frame to frame.

In the case of stitching a stereo panorama, the flow graph is used to track distinct pixels representing like visual elements in the scene between adjacent cameras. Using this in conjunction with known physical camera geometry and lens characteristics, it is possible to determine the distance of each pixel between the cameras and therefore a disparity (depth) map of the entire scene.

This is just a small snippet of the tech being used for the industry, but it should convey the large amount of data being played with, and the techniques use for mapping content. Several bottle-necks exist, though some of the hurdles should be bypassed over 2017.

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## Social VR

With Facebook and Youtube's implementation of a 360 mode on their platforms, there has been a rush to exploit the technology in a variety of ways. Some are commercial - Clash of Clans had a 360 Youtube advert of a minion riding a pig to battle, advertising their mobile game. Others fall in the subcategory of empathy VR, placing viewers in a first-person, high-intensity situation for immersive effect.

What is vital about the tech is that it would be the very first time in which most people would be able to experience a 360, immersive effect on their phones. While most would not wear a headset to experience the content, they would move their phones around to get a good view, if for a few short seconds. It's not a powerful effect, in much the same way that Google Streetview does not transport people into a new world; but it does grant a broader, more in-depth level of immersion which is a small step beyond lines of words on their screen.

What is vital then is that this is the easiest, most accessible way to view immersive content – and developers are aware of it, with 76% of devs focusing on mobile VR.\* Having access to Facebook or Youtube are only barriers of entry for consumers to view the content, without the need for expensive computers. It is the most shareable, viewable, and basic kind of content, at least for the moment.

There are three key areas of attention for the mass-adoption of VR. Fabio Murra of V-Nova identifies three key areas to focus on:

**Picture quality:** Without high quality, VR lacks life-like details and loses the core of its market proposition – its capacity to engage deeply with the consumer.

**Device support:** Smartphones have the great advantage of being ubiquitous TV consumption devices, enabling consumers to access content in any format, from 2D to 360 and VR.

**Affordability:** VR and 360-video need to enhance existing programs through short, high value content at a reasonable fee; without impacting mobile data bundles, ISP contracts, or excessive consumer investment in new playback devices.

All three are common points which are well-known in the industry, but it bears repeating here as social VR fulfils these categories. Affordability and device support is brought down to basic levels when a large chunk of the population has sophisticated smartphones to access the content on their favourite platforms. Though picture quality is low when compared to the HTC Vive and its competitors, the key point is that it is *good enough* - in a world where the general consumer is *not* aware of 8K or HDR and the like, it's enough for an introduction into the technology. In this case, the right applicability can beat crystal-clear quality.

With its low barriers of entry for brands, it is expected to become a first-step place for companies to experiment with the technology, if at least for the short term.

\*Sketchfab, "VR Industry Trends" (Jan, 2017)

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*To ensure that truly immersive 360-video and VR experiences can be successful at scale and consumed by the majority of the population, operators need to deploy solutions that leverage their existing infrastructure and ecosystem of current devices.*

”

**Fabio Murra**

SVP Marketing at V-Nova

## Marketing and Brand Applications

With the hype around VR, it is important to recognise how few people are actually tapping into the area. In a recent report, a very low percentage of marketers surveyed are currently using virtual reality (8 percent) or augmented reality (7 percent). Similarly, under a quarter are thinking of using the technology in the future.\* This may indicate that marketers are sceptical about how it can be applied, whether it can be applied to their organisation, or whether there is any point pursuing something which may not reap the awards they want. Yet times may change, and interest is improving - so for those who would like to dive in, there are a few points to consider.

The first aspect to consider is how distinctly different it is from TV and YouTube. Both mediums can convey the core messages of a brand quite clearly with proper positioning, select scenes, and the proper use of music. The cut is vital – everything seen in a precisely edited video was made precisely to entertain and direct a call to action of some sort, whether to donate to a charity or purchase a product.

The Nintendo Switch's reveal is a fantastic example of this, with a clear demographic re-orientation of sorts for its audience. The trailer shows young, somewhat affluent people using the Switch on the go, with friends, and eventually at home after a day of travelling. The video's content and editing was telling – it shows that Nintendo is aware that a large part of its audience has grown up, while keeping in touch with its roots for children.

Because of this, immersive reality provides a new perspective which doesn't take a small step – it's a leap into a whole new place in another conceptual galaxy. The added complexity of having a layer of interactivity provides a new level of empathy – and empathy is the best way to describe how to best use the technology. It allows the viewer to slip into another person's skin, get a feel of their situation, and much more intensely than with a simple video.

Because of this brands are experimenting with the technology, though the focus must be on how it can be properly applied. "VR should not be seen as a gimmick to bring in crowds," says Albert Millis of Virtual Umbrella. "In the past we've have seen brands who have not grasped this concept. Believe it or not, you can't use a VR rollercoaster simulation to sell IT infrastructure consulting."

Like Albert, many worry in its misuse. VR is already a hot topic, and many websites are using it as a trend to hop onto – a hype train where they can farm a few more clicks or views.

Pedantic-wise, it makes sense for the advertising to be native to the software, not a pop-up within a virtual space. Mark Castle of VRTize argues that integrating static or video ads sensitively into VR environments doesn't destroy immersion or annoy users. This makes sense – it needs to be an integrated experience for it to be accepted within the virtual framework, without detracting from the overall experience – then again, pop-up ads on YouTube, while annoying, are still a major revenue stream for the company and are unlikely to go in the future.

\*Yes Lifestyle Marketing, 'The 2017 Yes Lifecycle Marketing Channel Report' (Jan, 2017)

## Case Study – Etihad Airways

Taking a stab at using Hollywood talent to push their brand with VR, Etihad Airways released a 360-degree virtual reality film starring Academy Award winning actress Nicole Kidman. This marked the first time that a Hollywood actor has ever starred in a fully immersive virtual reality movie.

The five-minute feature, titled 'Reimagine', immerses its viewers in a fully experiential journey following Nicole Kidman through one of its new Airbus A380s flying between New York and Abu Dhabi. An Etihad Airways A380 was used for three days and fully customised prior to filming; overhead lockers, seats Red Dragon cameras, which were used to capture the actress' movement through the aircraft. Hundreds of individual lights were required to ensure smooth and uninterrupted shots. In other words, it was a massive project.

Peter Baumgartner, Etihad Airways' Chief Executive Officer, said: "We want to share Etihad's story in a completely new way, using technology to make our consumers a part of the narrative and to experience an Etihad Airways A380 flight first-hand, from anywhere.

What is fascinating about the case study is the star power mixed with the technology. It's using new and upcoming tech to make a dent on social media and bring a new fold to airline marketing. The video is now close to 2,500,000 views, and a large part would be the novelty value of its application – and it is also very well-made.

Ola Björling, MediaMonks' Global Director of VR who helped with the production, said: "As the most multidisciplinary medium there is, virtual reality relies more heavily on craft and execution than anything that has gone before it. We believe the display of artistry in every facet of this production is setting a new benchmark for live-action VR."

What the video doesn't betray is the intense difficulty of a production like this. Mark Blair, VP of EMEA at online video platform provider Brightcove, comments that creating fully immersive experiences is time-consuming and expensive, which is why there are more near-term opportunities for brands (like Etihad Airways) to develop successful VR and 360-degree video content than there are for traditional media companies. In much the same way, these productions are expensive, time-consuming, and the return on investment is not obvious. It is a risk – but it is one which could pay off.



## Video Gaming and Entertainment

2016 finally saw the consumer-end VR headsets hit the market, with a polite applause from the public. The demand for the headset was relatively inelastic, where while the potential is still there, though not the rampant success of other relative products.

The PSVR made a good splash, and it sold relatively quickly and with decent reviews. With the comparatively cheaper PS4 gaming set more readily available, combined with Sony's full-fledged support, it looks to be a powerful contender in the gaming space. However, historically Sony tends to support products and then lets them slowly die when they are not doing as well as they like (see PS Vita and Move), but with the success of Resident Evil 7 and the underground hit of Thumper, the PSVR has a strong start.

Yet so far, there is not that 'killer app' which shifts copies, no flagship titles to shift hardware. There isn't the equivalent of Super Mario for NES, or Halo for Xbox. Resident Evil 7 may be close to that flagship title, if Twitter is any indication when it was released – but as stated previously, the issue is that demand is relatively inelastic.

Rick Gibson, Director of Games Investor, predicts that despite 2016 being labelled the year of VR, it will be late 2018 when we first start to see critical mass and then breakout (multi-million selling) success for VR titles, especially outside Asia. In

his eyes, a hundred million unit installed base is still some time away – which reflects the views of many analysts in the industry.

What is vital is that these gaming experiences bring a new level of gameplay which actually utilise the technology properly. Horror games where you have to literally peep around the corner, or stealth games where you have to crouch to hide are great examples.

Some designers are confident for VR in 2017 because of this. Byron Atkinson-Jones, Game Designer at Xiotex Studios, comments: "2017 is going to be the tipping point for VR. The tech is already very impressive but the sales of games are not - it's a running joke that the only people making money from VR are those holding VR conferences and Zenimax. My game has been at the top of the best-selling list on Steam for a while and it's shocking to find out how few games you need to sell to get to that position on Steam. Unless things improve, 2017 will see many who aren't backed by third party funding pulling out of making VR games."

In 1995 Nintendo introduced the Virtual Boy, one of its greatest commercial failures. Poor third-party support, poor graphics, and misleading marketing led to the failure of the first gaming VR headset. But over twenty years later, we have finally reached a point where the technology has caught up with the imagination and creativity of its developers, and we are now on the crest of a massive, industry-changing wave of





innovation.

We do need to be careful about what reporters say – many tech writers describe VR as an incredible experience, but they were usually playing on GTX Titans. Certain genres would not work well either – a 2D platformer would hardly be entertaining for the user, nor would an FPS where the neck would constantly need to be turned. Nor would a Sonic-like game work either, as the speed will likely nauseate users on their first try – an example of the ‘meathook effect’ when a user does not have full control of its environment. But the future is bright, and there are so many games which use the tech in creative ways.

We have seen something like this before. 3DTVs saw a large marketing push by large brands and were predicted to be the next step in technology for TVs – but the adoption was low. Many tech commenters say that VR will go the same way – a large push by big brands, followed by silence as consumers were unwilling to purchase the expensive hardware. Yet VR is nothing like 3DTVs. 3DTV is a gimmick which does not add much to the cinematic experience, save for movies with 3D in mind. VR is different in that it introduces whole new experiences to its users, as well as a heightened level of interactivity. VR is more a new step rather than a next step.

There is also no doubt that YouTube will be influential for VR. During the seventh generation of consoles, Youtube has grown in tandem with the gaming market, as consumers are now moving towards YouTube for reviews and first impressions rather than traditional news outlets. The trend will likely continue as key influencers like Totalbiscuit, Markiplier and Pewdiepie use the software for themselves and present

them to the public. I have a personal fear however – their core demographic is young children and teens who do not earn their own income, so much of their core audience is unable to purchase the headsets. That said, their audiences have aged and matured over the years and I suspect 2017 will be the year where the Pewdiepie fan can watch a video and purchase it with their own money – the rise of the centennials.

Yet seeing the vast array of headsets reminds me of the nightmare of Android development – how there are many different kinds of Android and developing for them all is difficult. Developing for all the VR headsets presents the same problem: Samsung Gear games would not work with Oculus, certain HTC Vive games with Oculus, and so on. If there were to be any killer apps for certain games, it is more likely that they will dominate one platform at the expense of another. This was what happened with the Wii U, as the architecture was too different from the current generation. Thus developers focused on the Playstation and Xbox which can both be developed on and released to maximise spread, while the Wii U was left to the side.

The future of VR gaming looks bright, and Resident Evil 7 is a break-out case of a fan base being picked up around a game designed for it. It's a question of time and patience, and I look forward to seeing what is around the corner for gaming.

## Filmmaking - Storytelling

In the late 1920s, the film industry was revolutionised by the commercial introduction of sound with movies, or talkies. Now we see a repeat of this phenomenon with VR storytelling. Originally with *The Jazz Singer* (1927), continued by *All Quiet on the Western Front* (1930), and parodied in *Singin' in the Rain* (1952) audio began to transform film. It was a time of rudimentary transition, restricted camera movements, live dialogue, and minimal editing. The earliest talkies were primitive, and often designed to capitalise on the novelty of sound. Talkies eventually dominated the filmmaking landscape – but only after exploration and experimentation.

The VR industry is inundated with gimmicks and improper use of the tech as companies once again cash in on the novelty, or fail to capitalise upon its the potential assets. It is a new storytelling medium, there is no rulebook and innovative creators are exploring the best ways of using the technology. This is an exciting time, and will give birth to influential companies in much the same way that Warner Brothers was born from the talkies era.

Visualise helped Jane Gauntlett bring to life the idea of empathy VR with “In My Shoes: Dancing with Myself”. The 360-degree video gave the viewer an intimate first-person perspective of what it’s like to have a neurological condition.

Between films and virtual reality the crucial difference is the role of the viewer. Will McMaster, Head of VR at Visualise, highlights that the viewer is taking up physical space within the virtual world: “I think the sensation of watching a story in VR is as much a physical experience as it is visual... in traditional media, we don’t have to take physical space into account because the viewer never changes physical position. They’re always in a chair, watching a two-dimensional representation of reality. In VR, we are changing the viewer’s entire sense of reality.”

“It sounds really obvious, but it’s something I think about a lot because you start to realise that your entire set of advantages and limitations in telling a story in VR stem from this physicality... I don’t think these disadvantages mean that you can’t tell a great story in VR, but I do think that how that great story is told is going to be very different from how it’s done in traditional media.”

At the most basic level, the viewer has a place in the virtual world. While films audiences are led by cuts and camera movements, their identity is separate – there is no need to give the audience a role. VR challenges this. When placed in a virtual world, the viewer feels that they have a physicality and presence within it; this sees the viewer start to question their identity among the fuss and furor. The viewer should be given a purpose – a reason to exist within VR. A ghostly, labelless presence makes the viewer challenge their role and disrupts the immersion or flow of the VR experience.

“

*VR film studios are emerging at an incredibly exciting time. Writers, directors and actors all must re-learn their craft by experimenting with new techniques in the frameless 360 virtual space. 2017 is lining up to be a great year for VR, with many studios outlining their plans for new productions.*

”

**Alyssia Frankland**

VR Director for Breaking Fourth

## Case Study – How is VR filmmaking different?

When it comes to making films, the camerawork and editing is potentially one of the most important elements of any film. The positioning of individuals in a certain way, or a type of cut, or a particular focus on one area – they can tell stories without the use of dialogue. In VR, those rules break. Erfan Saadati, VR Producer at Surround Vision, gives his own thoughts on this:

“VR borrows equipment and workflows from the traditional realm, but crews and kit are much more compact and smaller in footprint. So a VR shoot can happen with minimal crew, compared to a film crew that requires hundreds, which is a huge benefit both practically and financially. In terms of staging and *mise-en-scène*, again traditional and VR vastly differ. In traditional productions everything is composed for a frame but in VR we create worlds where the viewer can explore and interact.

“Traditional filmmakers can use zooms and wide lenses to change viewer perspective but VR has little to no control in this respect. We have to stay true to the world we’ve created and keep the environment realistic so that viewers become familiar with it. Close proximity is key. At VR’s current technological level, background details get lost. Combined, these factors give VR creators less control over the viewer’s gaze and actions. VR can’t rely on key moments and close-ups so this places even more importance on making sure virtual worlds are thrillingly engaging.”

*Surround Vision assisted Sky Sports to capture the excitement of the year ahead with an access-all-areas tour in VR for delivery to their Facebook 360 channels.*





## Case Study – We Wait

Earlier this year, Aardman collaborated with the BBC to collect the stories of migrants, and illustrated their flight from danger amidst the refugee crisis. We Wait follows a Syrian family about to embark on their second attempt to cross the sea to Greece, and the troubles they face.

Daniel Efergan, Digital Group Creative Director at Aardman, understands how the viewer personally connects to the experience: “What’s apparent as this new platform emerges is how storytelling is hardwired into the human condition. Although the technology has arisen from simulation sectors, the initial offering appearing in consumer stores are primarily stories. This desire to master our tools but ultimately tell stories is a very human thing, and the depth and intrigue of the experiences already appearing suggests that VR will be a powerful tool to tell powerful stories.

“This is why Aardman is involved. We are a company of character creators and story tellers. If there’s the potential to tell stories in new and interesting ways then we’ll want to start unravelling how to do it.”

In We Wait, being shouted at and blinded by headlights makes a mark on the viewer, while being restricted to a singular spot makes the viewer feel more helpless than an omnipotent God of War or Mother of Dragons. The abstract models added to the experience – by taking a less realistic approach, the production felt emotionally charged, more raw. A sense of place also contributed to the story’s engagement – as Daniel said, “a simple glance from another character seemed enough to draw the audience closer, more likely to follow a character’s story.”

WE WAIT



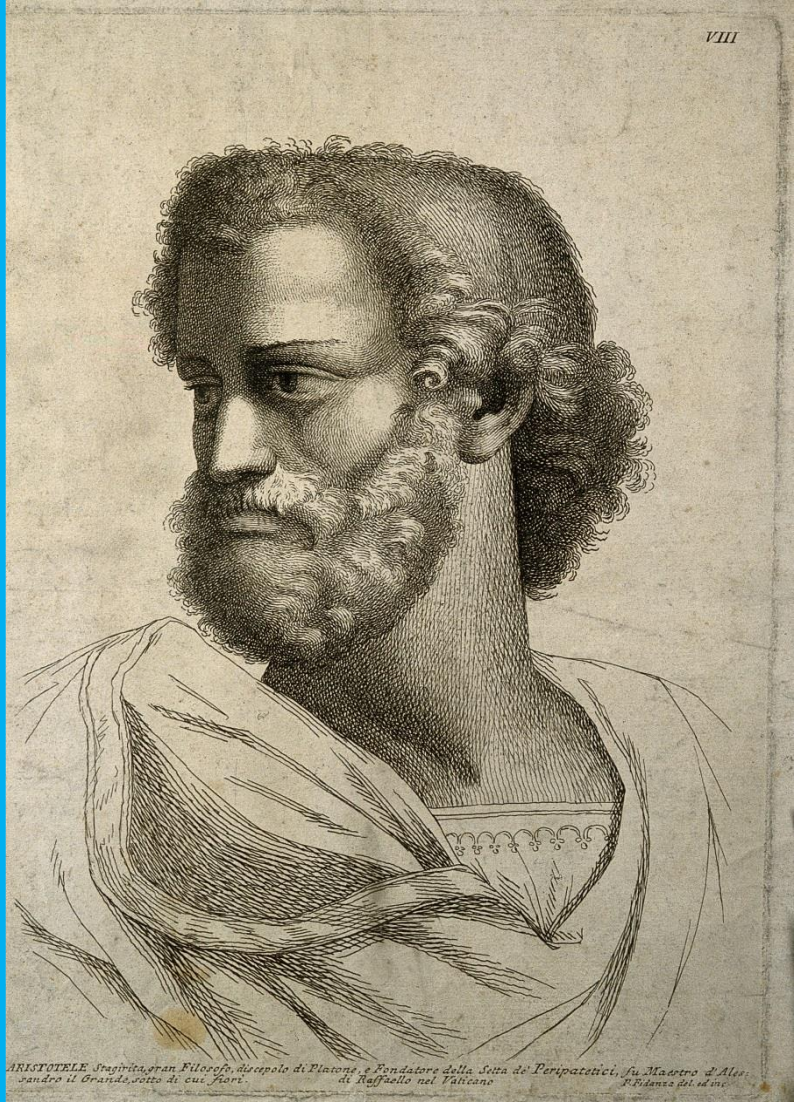


Of all topics within technology and its application within the education, one of the most interesting is the idea of the “digital Aristotle.” This is when a personalised teacher, tailored to each pupil, follows and teaches the individual to perfectly match their pace and strengths. Instead of a class of 20 where the pace of the class would not match each person’s comfortable learning speed, a digital Aristotle would help create the leaders of the future with a perfect pace of teaching, in much the same way that Alexander the Great was guided by Aristotle.

Immersive technologies could bring the next step in this, by providing more tactile feedback to lessons. Visiting a battle, or feeling an object through haptic feedback, or witnessing a geological event would all add an additional layer of aid which would help students learn their lesson, in much the same way that a smartboard can be used to bring the internet to classroom.

For a good explanation of the Digital Aristotle, check CGPGrey’s video “Digital Aristotle: Thoughts on the Future of Education” (Nov, 2012)

Aristotle, with line engraving by P. Fidanza after Raphael Sanzio. Image credit: Wellcome Images



## Education

Over the last few decades teachers have been using new techniques to help children learn, developed as a way to improve engagement. Field trips help students gain an impression of a historical period by visiting the land rather than watching a video. Experiments in the Science classroom help students see how reactions work in a safe environment, rather than reading the cause and effect in a textbook. The developments allow students to get a better understanding of the topic, and technology helps to facilitate that.

Virtual reality sparks students’ interest because it is new and exciting. VR plays by different rules than most other media: The audience doesn’t see the scenes from a fixed point – like in a photo, movie or most theatre plays – but becomes part of it. This adds a whole new level of fascination and makes the learning content more engaging. It aids learning.

Delightex founder Eugene Belyaev agrees with these thoughts: “Virtual reality makes learning more vivid and engaging: Instead of just reading about something or looking at a picture, kids can become part of the learning matter. This makes it much more memorable. When students create the educational VR content – which is already happening a lot with CoSpaces – there is an additional benefit: Making something yourself is the best way to understand it.”

## E-commerce and Retail

When dealing with immersive technology, the next natural step is to consider if a store-front can be replicated on a screen. Why browse with pictures on a website when you can virtually see the products for yourself? It is also a profitable area; immersive technology could add an extra £1bn to the UK's home décor retail market.\* In a similar way in which retail companies are experimenting with how a house would look before it is built, the same principle applies to e-commerce as well.

Elinor Pitt, Founder of Hive & Design, says that there are two barriers to consumers using AR in e-commerce. The first that in order for AR to have real application for consumers, virtual objects must be capable of being scaled in a real world space. Until this technology is more widely distributed among consumers, we think e-retailers' AR offerings will remain gimmicky in the eyes of their customers.

The second barrier is the customers themselves; how will customers embrace this new technology when it becomes available? Understanding this is core of the challenge facing companies looking to deploy AR in the e-commerce space. The challenge is made harder by not knowing what applications and SDKs will be provided with new depth sensor enabled consumer hardware when it arrives. Until then, consumer focused AR companies must use this time to learn as much as they can about how customers interact non-scaling AR and derivative technologies so that they are ready for the inevitable arms-race when it starts.

Both are important barriers, constrained by perceptions and technological restraints. Yet its benefits are clear – with an additional layer of feedback, the benefits can shape the way in which customers shop.

\*DigitalBridge, "The imagination gap: Retail's £1bn problem" (Jan, 2017)





“

*With so much competition for attention, brands need every advantage they can get, and in 2017 we'll see how computer vision will give retailers that advantage.*

”

**David Levine**  
CEO of DigitalBridge

## Medical VR

Health and VR is one of my favourite areas to focus on. Beyond the consumer-facing elements of how it can be used and retail, health VR is one area where it can make a significant and important impact on someone's life, and genuinely become a positive and healing force. Perhaps more importantly, reports show the impact will be noticeable.

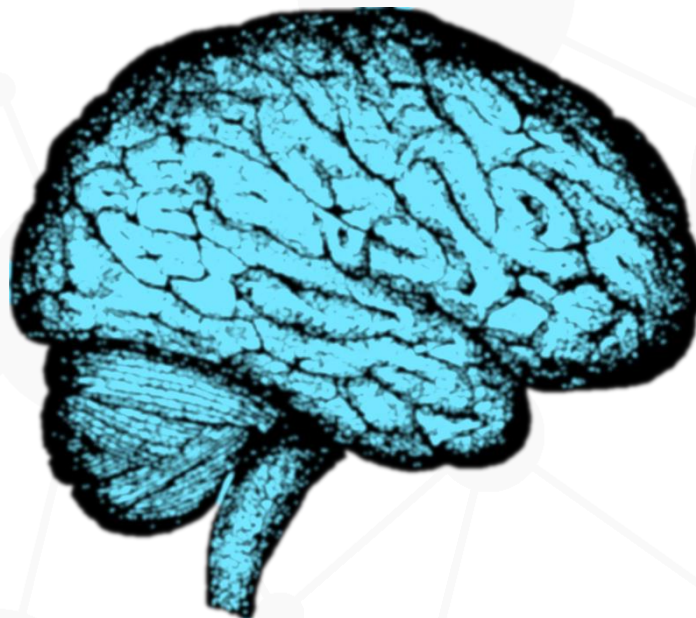
Plextek did a report on the 'The Future of Connected Home Help,' and some of the most interesting findings include:

- 52% of consumers would be willing to try virtual reality for group rehabilitation, as a significant 78% feeling current rehabilitation methods are just not effective
- VR systems in the home will empower users to work through rehabilitation and therapy at their own pace, rather than being limited to specific appointment times for hospital treatment
- Collette's prediction that technologies in the home such as VR could save the NHS at least 60% on the average cost per patient

What is particularly interesting about these points is its applicability. VR has the flexibility to help these patients at a pace which matches the patients. This follows the Digital Aristotle theory in teaching – if the pace matches what the patient can handle, the recovery would be smoother.

Mel Slater of Digital Catapult surmised medical VR's capabilities rather succinctly: "The opportunities in healthcare can benefit both doctors and patients. For healthcare professionals, VR can transform how training is delivered, enabling medical students to practise surgical procedures, and avoid traditional cadaver-based training. This brings significant time and money efficiencies, whilst democratising the access to training across the world.

"Immersive technologies could also prove very advantageous in the field of imaging, with doctors using such technology to explore entire bodies, in images built up from MRI scans, floating in front of their eyes. What was once an idea just for sci-fi films will soon become a reality in our hospitals of the future."







## 2017 Onwards - What Next?

With 2017 just starting, rumours are abounding for the future and its applications. It's expected that immersive technology will be slowly adopted and implemented, alongside various more companies putting their stake in the industry with their own hardware applications.

One curious area is the rise of standalone devices. ABI Research predicts that there will be a 405% increase in standalone headsets through 2021, pushed by western and Chinese markets and driven by more compelling content to drive sales.\* We are seeing hints of this starting, but it would be interesting to see if the content would be delivered appropriately for them.

While it's been evolving slowly for a long time, it may be time for it to go beyond one of its biggest hurdles. Vishwa Ranjan, Head of Augmented and Virtual Reality at Infosys, comments: Despite enormous traction with the technologies in 2016, a critical issue surrounding AR and VR will remain unsolved: the technologies will not see mass production until they solve a problem for every day and niche users. But this year we will overcome this hurdle. 360 video (pre-recorded or live) based apps will be the initial drivers of these content-driven technologies with focus on surveillance, collaboration, and telepresence.

"We already see businesses in transportation, entertainment, retail, healthcare and industrial equipment applying AR and VR to help solve problems – these are the industries that will continue to lead innovation this year. In 2017 we'll also see construction, industrial maintenance, data and process visualization, and even agriculture enter the market, as well as education to bring lessons to life within the classroom and outside of it (such as training technicians). And with AR/VR in education, we'll train our students to see the world and learn in a new and exciting way, which will spark the next generation of technological advancements."

Deloitte surmised the future very well – the confluence of mixed reality technologies has massive implications. The design of software is also utilising sensors, gestures, voices, and digital content – the way we interact with the world is shifting, powered by IoT.\*\* It's a blend of a useful digital reality to help assist the real reality of maintenance, production, quality control, and development.

\* ABI Research, "Augmented and Virtual Reality Devices and Enterprise Verticals" (Feb, 2017)

\*\*Deloitte, "Tech Trends 2017: The Kinetic Enterprise" (Feb, 2017)



## Where does the Hololens fit in the future?

The Hololens is a curious beast which isn't reliant on smartphones or the mainplay headsets, but rather a new kind of tech which falls into the realm of mixed reality. With Microsoft's push and its applicability with brands, the tech looks set to make a good impact in 2017 – with some predictions marking that smart glass shipments will rise to 28 million in 2021.\* Daniel Cheetham, Chief Interactive Officer of Happy Finish Global, comments:

"Looking forward, our rapid move towards Mixed Reality, made possible with headsets like the Hololens, will have huge implications on how brands market to consumers. These devices will undoubtedly play key roles in education, how efficient we are in work and how we interact with each other both professionally and personally - they will be engrained in our everyday lives. How brands leverage this new medium to impart their messages to audiences is currently a topic of much debate, and it is an area where we at Happy Finish are making interesting headway.

One thing that's very clear is that the content that brands will create for Hololens and similar headsets will not be of a traditional one-way communication style, like that of a TV commercial or a print ad. Mixed reality offers the best ability yet for brands to develop meaningful long-term interactions with target customers. These conversations will be supported by our ability to better personalise content using artificial intelligence and machine learning. Rather than brand communication being a passive experience for the consumer, we will be able to create interactions that offer utility to the end user."

\* ABI Research, "Augmented and Virtual Reality Devices and Enterprise Verticals" (Feb, 2017)



Credit: Happy Finish

## Concluding remarks

2016 has shown us that the world lives in social echo-chambers, where we see only what we want to see, and we are semi-restricted with what we can experience and understand.

The immersive reality industry is the same – it is a massive, self-perpetuating bubble housing enthusiasts from around the world. What may be obvious to a developer would not be obvious to a casual onlooker.

Many people in the public have time and time again shown that they may not know what VR actually is. Likewise, the common observer's views of what VR is – that it may be restricted to gaming, or that mobile is 'true' VR – would not be correct in many VR developers' eyes.

This report is written by an enthusiast to capture a glimpse into the state of VR – and while I won't pop any bubbles, I hope to let some chinks of light come through for anyone who reads this.

At a time of revolution it is difficult to see where the cause and effect of a company's actions may go. This is not in a negative way – immersive technology is here to stay. It's a question of which verticals will pick up the technology and solidify itself with it the most. But in any case, it looks bright, hopeful, and best of all, exciting.

Let's see where this train goes next.



## Thank you for your help

**Alyssia Frankland**, VR Director, Breaking Fourth

**Daniel Cheetham**, Chief Interactive Officer, Happy Finish Global

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**Jeremy Dalton**, VR/AR Lead, PwC

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**Catherine Allen**, Freelance Filmmaker

**Luciana Carvalho Se**, Chief Evangelist, Realities Centre and Racefully

**Fabio Murra**, SVP Product & Marketing, V-Nova

**Albert Millis**, Managing Director, Virtual Umbrella

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**Mark Blair**, Vice President of EMEA, Brightcove

**Mel Slater**, Immersive Fellow, Digital Catapult

**Rick Gibson**, Director, Games Investor Consulting

**Will McMaster**, Head of VR, Visualise

**Erfan Saadati**, VR Producer, Surround Vision

**Dan Efergan**, Digital Group Creative Director, Aardman

**Eugene Belyaev** Founder, Delightex

**Collette Johnson**, Director of Medical & Healthcare, Plextek

**Vishwa Ranjan**, Head of Augmented and Virtual Reality, Infosys

**BBC Research & Development**

**ABI Research**

**SuperData Research**

**Digi-Capital**

**Yes Lifestyle Marketing**

**Jaunt**



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*In his spare time Tom writes sci-fi, and handles the public relations for QuidditchUK and the Quidditch Premier League.*

*Tom also works in Porter Novelli London as an Account Executive, specialising in technology PR.*

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