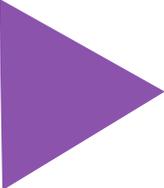


# Adoption Trends

Immersive - Updated July 2020



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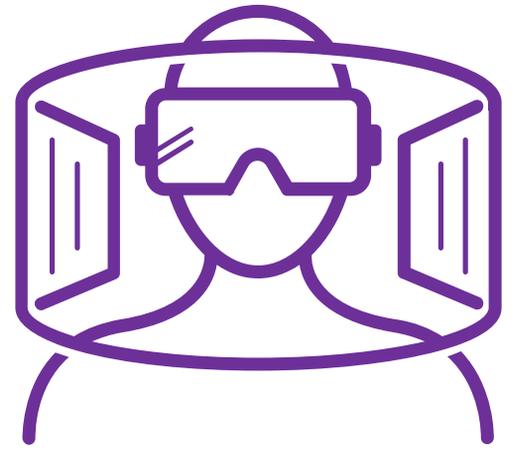
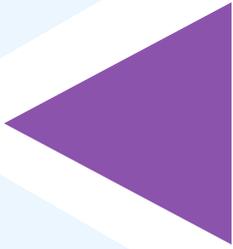
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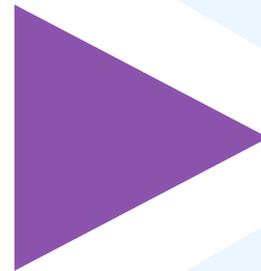


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# Introduction

IABM Media Tech Trends reports annually track the adoption of specific emerging technologies within the broadcast and media sector. The purpose of these reports is to enable member companies to better understand the drivers of emerging technologies' adoption within customer organizations. This should provide member companies more tools to better address the challenges lying ahead, from new product development to marketing strategy. These reports contain a discussion on the state of adoption of the emerging technology in broadcast and media as well as an analysis of significant customer deployments.



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# VR Essentials



**Virtual Reality** is a simulated environment created by utilizing computer technology. It relies on headsets to achieve a full 360-degree view of a virtual world. More specifically, it relies on sending streams with complex processing into headsets.

Headsets can be divided into two main categories:



Simple holders for handheld devices like smartphones (usually require specialized apps to help the viewer with the VR experience)



Full-blown headsets that typically require a base station connection

**2014**  acquires Oculus for \$2bn

**2016**  dedicated consumer VR headsets arrive in the market

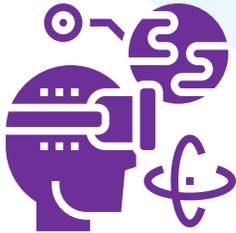
**2018**  stand-alone headsets arrive in the market

**2020**

-  Apple acquires NextVR in a deal reportedly worth \$100m
-  Oculus launches a new lighter version of the Oculus Quest headset
-  HTC co-founder launches XRSpace – a new mobile VR headset equipped with 5G wireless networking

Slow consumer adoption of VR equipment has led to a **significant price decrease in VR headsets**. The **complexities and costs of VR content production and post** have also contributed to stifling adoption in the media industry. With regard to broadcasting, **the main application area remains sports** where VR could represent an alternative to watching a game in the stadium. Moreover, **live VR music events have gained momentum** over the past six months, driven by the cancellations of live events during the COVID-19 crisis.

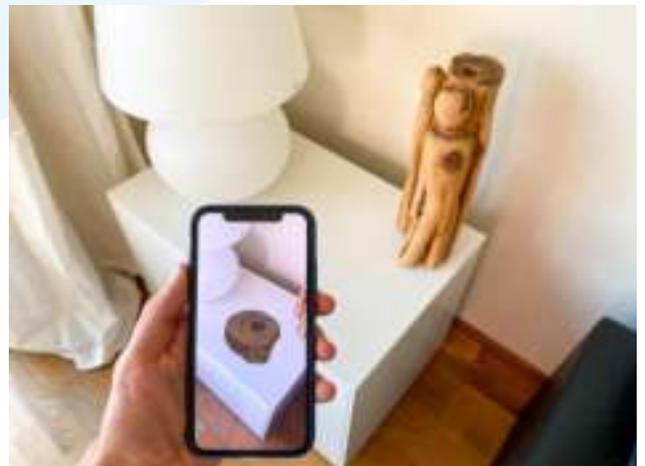
# AR Essentials



**Augmented reality** overlays digital information onto the physical world. Initially, AR relied on AR glasses, but today AR experience is enabled by smartphones and tablets thanks to frameworks created by Apple and Google. As a result, there are now billions of devices in the market which are compatible with AR.

On the **content production** side, companies like Facebook and Microsoft are developing technologies capable of recording actors and scenes in three dimensions. For instance, Microsoft, with its Mixed Reality Capture Studios, is developing holographic production capability. Jaunt, a company known for its VR productions, is focusing now on AR and has recently developed a production set that works with six cameras and can stream holograms live.

One of the first broadcast applications of AR is **sports**. However, it is also often used in the **production of documentaries** as well as **content for kids** and **education**. AR can also be widely applied in **advertising**, allowing customers to make their purchase decisions based on a higher degree of realism.



# VR and AR Adoption Tracker

For years, VR has struggled to achieve widespread consumer adoption. The high cost of headsets and lack of content, which is fragmented on a plethora of apps and devices, are among the main reasons for this. So far, **most VR applications have focused on live sports**. As a result of this, spending on VR has also been correlated with the occurrence of important live sporting events such as the FIFA World Cup.

With the occurrence of the COVID-19 pandemic, **many sporting events around the world have been canceled or postponed**, including the 2020 Summer Olympics and Paralympics. However, with at least a third of the world's population being under some form of lockdown, the **Coronavirus has forced widespread behavioral change among consumers**, which will likely translate into new opportunities for VR adoption.

Most VR deployments have seen broadcasters (and leagues) partnering with VR specialists such as **NextVR** and **Jaunt VR**.

## Apple acquires NextVR



In May 2020 – during the pandemic – NextVR was acquired by Apple reportedly for \$100 million, meaning more financial resources for the leading VR start-up, which is now expected to launch new VR innovations soon.

# VR Adoption Tracker



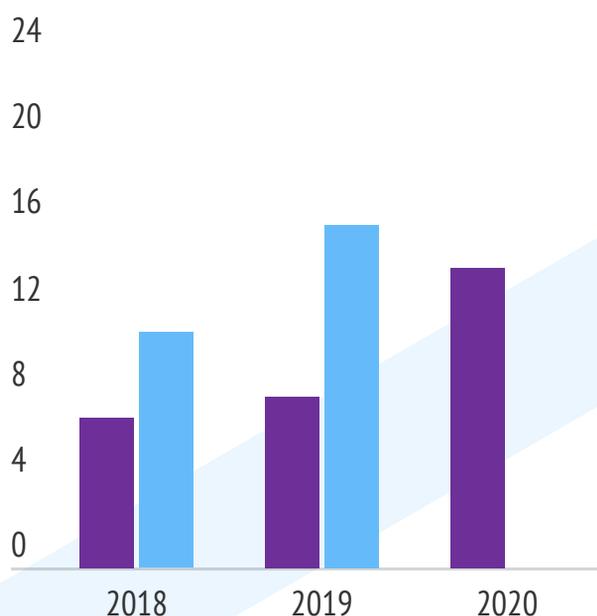
● % of companies that have adopted it

Our VR Adoption Tracker shows that **VR adoption accelerated significantly in 2020** compared to the previous year.

The accelerated adoption of VR technology is primarily explained by those end-users who already had such an intention in our previous survey.

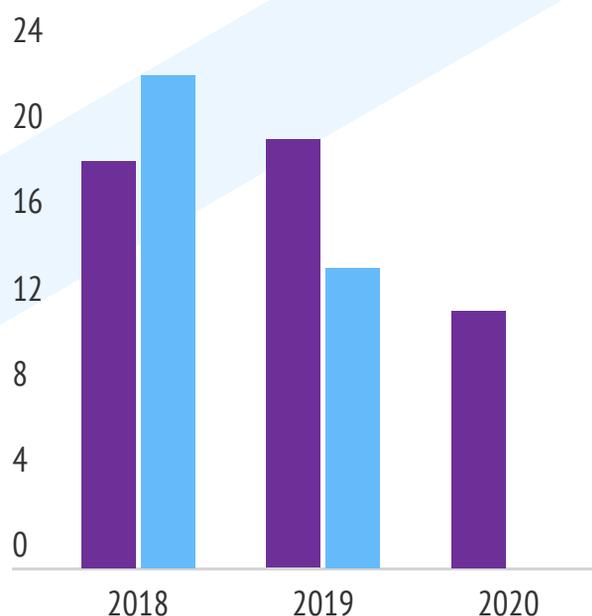
Now, the share of end-users who intend to adopt VR technology has decreased slightly, but still remained at a relatively high level, signaling that VR will continue to be adopted by the broadcasting and media industry in the coming years.

**% of companies that have adopted VR**



● NAB ● IBC

**% of companies that are very likely to adopt it**



● NAB ● IBC

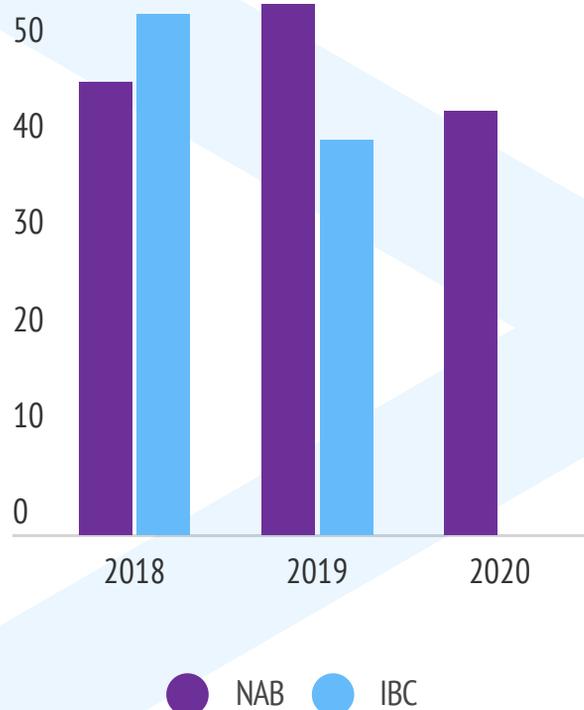
# VR Adoption Tracker

## ADOPTION BARRIERS:

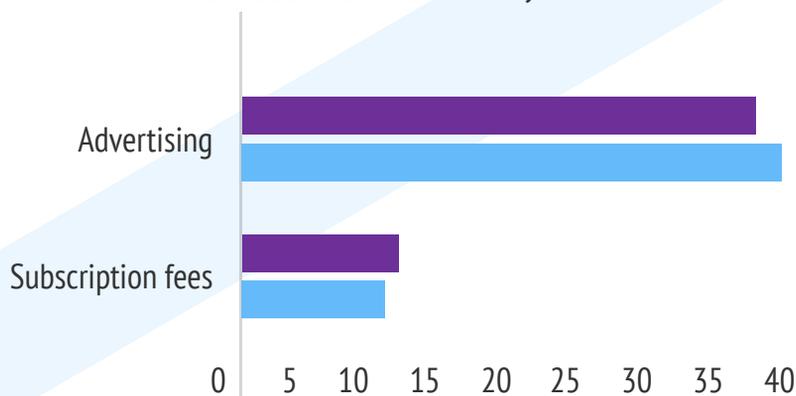
- Lack of certainty around the business models to support VR
- High fragmentation of VR content on a plethora of apps and devices

One of the main reasons behind the low adoption of VR is the **lack of certainty around the business models** supporting it. However, in the new circumstances created by the **COVID-19 outbreak**, **consumer adoption of VR technology has started to accelerate**. Facebook detailed in its most recent earnings call that 80% of its quarterly revenue growth (YoY) came from "Other (non-advertising) revenue [\$297 million]", primarily driven by Oculus products. At the same time, our VR Adoption Tracker demonstrates that **the level of uncertainty about the business model among end-users decreased in 2020**.

## % of companies not planning/ do not know how to monetize VR



## Preferred business models for VR, %



The majority of broadcasters **rely on advertising**, rather than subscription fees based **revenue**.

# Market Developments

## Consumer Adoption

Consumer interest in VR waned between 2017 and 2018, which has led to a **significant decrease in prices of the headsets for consumers**. Today, they are only about half of the cost compared to their launch year of 2016, while stand-alone models no longer require a high-powered PC to operate. However, consumer adoption of VR equipment was lower than anticipated in 2019. Deloitte's "Digital Media Trends Survey" found out that only 14% of all respondents owned a VR headset. However, **the occurrence of the pandemic that resulted in lockdown in 2020 forced consumers to stay at home, and this made them turn back to immersive experiences at an unprecedented rate, presenting a unique opportunity for VR adoption.**

Most current users of the technology seem to rely on headsets connectable to a smartphone - such as the Samsung Gear VR and Google Daydream.

## XRSpace from the HTC co-founder

The former leader of HTC Corp. is returning to consumer electronics creating a new virtual reality headset called XRSpace. It is a mobile VR headset **equipped with 5G wireless networking and over three hours of battery life**. XRSpace's headset **uses cameras to pick up hand gestures and track the wearer's motions**, and it creates a lifelike avatar from a selfie.

Later it will let users perform real-world actions like shaking hands or naturally shooting a basketball, according to Bloomberg. To build its virtual world, XRSpace has been designing public and private spaces for users to inhabit and even creating virtual stadiums where sports fans can gather together for shared viewing of a ballgame, which could be used, for instance, for watching the English Premier League, the most-watched sports league in the world, which is to be aired by BBC, Sky, BT Sport, and Amazon Prime from June 17, 2020.



Source: XRSpace website

# Market Developments

## Consumer Adoption

### Facebook, a social media platform



2014



#### Facebook acquires Oculus Rift

In 2014, many industry experts embraced Facebook's US\$2 billion acquisition of virtual reality headset manufacturer Oculus Rift as a market-defining moment for VR technology.

2017



#### Oculus Go launched

Facebook cut the price of the Oculus Rift twice in 2017. At the end of the year, Facebook launched a new US\$200 headset, Oculus Go, to gain control of the end-to-end VR experience. To boost the availability of VR content, Facebook created the Jurassic World film in partnership with Universal and Felix & Paul Studios and marketed it as new content for the Oculus Rift device. However, as a result of weak consumer demand, Facebook had to cut the price of the Oculus Rift twice in 2017, bringing it down to about US\$399, which was US\$400 less than when it was first launched.

2019



#### Oculus Quest and Rift S launched

In March 2019, Facebook launched the Quest (a newer version of Oculus Go), an all-in-one VR system with 6 Degrees of Freedom (DoF) priced at US\$399 and is set up through a smartphone app. In addition to the Quest, Facebook launched the Rift S – the next version of the Oculus Rift – at the end of May 2019, priced at US\$400. Compared to the Quest, the Rift S is intended for use with a PC, and it uses wires to connect to a PC powering the virtual reality experience.

2020

#### Oculus Quest 2 to be launched

Facebook is building a new version of its Oculus Quest VR headset, which is expected to be up to 15% smaller and therefore lighter compared to the original version, according to Bloomberg. In addition, it will have a faster image refresh rate for more realistic content. The new product was initially scheduled to be launched later this year, but is likely being delayed to 2021 due to the Coronavirus pandemic that has disrupted global supply chains.

# Market Developments

## Consumer Adoption

The coronavirus outbreak has triggered interest in shared remote experiences.

### Travis Scott's VR concert in Fortnite

A Houston-based rap artist, Travis Scott, held a concert within the virtual world of the game Fortnite. The show had a massive audience - it garnered 27.7 million unique visitors and was viewed over 45 million times, setting a single-event attendance record for Fortnite, according to Reuters.



Source: BBC.com

### Block by Blockwest VR music festival in Minecraft



Source: YouTube

Likewise, Minecraft held Block by Blockwest, a virtual music festival this spring, featuring Massive Attack among other artists. Because of the unexpectedly high attendance of 100,000 users crashing the servers, the event had to be rescheduled. The VR event has attracted 134k streaming viewers and 5.1k players in the game.

Consumers went online massively during the lockdown period – on April 22nd 2020, global video streaming traffic increased by 26%, and gaming traffic increased by 71% compared with a typical day pre-pandemic, according to Verizon. At the same time, the entertainment industry that depends on live events, including the sports and live music industries, has seen the unprecedented revenue streams' decline.

**This mismatch of peak consumer demand for content and limitations for content creators provides conditions that can boost VR as an alternative format.**

# Market Developments

## Producing and Managing Immersive Content

When it comes to **challenges related to VR production**, it is important to note that VR is a new medium, and thus, only a few of the current production rules can be directly applied.

**VR technology is still in its earliest stages** and needs to advance and mature, including such pipelines, as

### Acquisition and Production

**VR production cost is one of the major issues** faced by the industry players today.

It consists of different variables like:

Business costs

Amount of work

Value created

VR content production is notably complex and differs substantially from traditional television production. In VR productions, every point of a studio is in view, requiring directors to exit the room. In sports production, VR cameras need to be as close to the game as possible as they do not zoom.

Not only VR cameras and hardware are expensive, but there are significant personnel costs on top – VR broadcasts need niche specialists, with a high price tag.

### Post-production

In post-production, 360-degree video needs to be stitched together before editing.

**Post-production in VR has cost premiums** in excess of three-fold versus existing UHD productions.

# Market Developments

## Producing and Managing Immersive Content

### Eurovision Home Concerts

In March 2020, the Eurovision Song Contest was canceled due to the lockdown and then replaced with the "Eurovision Home Concerts" by streaming online concerts featuring 2020 acts as well as previous contestants. The first episode of the show was introduced on the 3rd of April.

The lockdown has put additional pressure on the recording process, forcing band members to record their songs remotely from different cities.



Graphic design and animation studio, Dreamwall, located in Charleroi (Belgium), delivered a Eurovision virtual studio for RTBF Entertainment from its Keywall studios powered by Reality from Zero Density. It went on air twice - on 14th and 16th of May 2020 - with two events: "Your Top 20" and the main event "Eurovision 2020: Shine a Light". According to Zero Density, 7 Engines were used for both productions. It was the first time that RTBF Belgium has employed VR technology for entertainment, although it has adopted virtual studios and augmented reality for its sports coverage for the past few years.

# Market Developments

## Producing and Managing Immersive Content

### Live Sports behind closed doors

As sports leagues around the world gear up to return after the coronavirus pandemic, an increasing **focus has been placed on how to replicate the atmosphere of a match-going crowd.**

A number of top US broadcasters, including **ESPN, NBC Sports, CBS** and **Turner Sports**, are looking to VR technology to emulate the live match experience for viewers when games occur behind closed doors.

**Fox Sports** is considering using AR to include virtual fans in stadiums.

**The English Premier League** is considering including fake crowd noise in order to improve the atmosphere of matches.

Spanish soccer league La Liga has collaborated with Norwegian firm Vizrt to enhance viewers' experience of live broadcasts of the games behind closed doors, when Spanish professional football returned in June 2020. Empty stadiums will be enhanced with virtual fans and FIFA crowd noise, pre-recorded from previous La Liga games; stands in La Liga stadiums will be 'virtualized' and offer to scale images of seated fans wearing the colors of the home team. This virtual set-up could be transformed into a canvas that will show institutional messages and other offerings at the end of the game. That would help to create an immersive experience for the viewers to emulate the live atmosphere they used to enjoy before the coronavirus pandemic.



# Market Developments

## Producing and Managing Immersive Content

### Live Sports behind closed doors

#### OZ Sports uses Augmented Reality to put football fans at the heart of closed-door broadcasts

OZ Sports and RVX Productions are rolling out new technology and services for rights-holders of leagues to make the experience more engaging for the fans. With the new solution, which also integrates into the wider OZ Connected Stadium, viewers can be dynamically added to live broadcasts with the use of advanced AR technology.

There are a number of personalization options for the fans:

Choosing their avatar

Choosing their club shirt

Having their face painted

Picking their favorite seat



Fans can also benefit from getting their voice heard by participating as either audio-only or with immersive visual participation in the live broadcast. OZ ARENA has advanced audio support, where fans can use an app to add live audio to the broadcast. The servers aggregate all fan audio, using low-latency time synchronization and AI algorithms to manage volume levels, enabling fans to yell as loudly as they like remotely without overpowering the audio stream. These solutions enable broadcasts to maintain full integrity and sound effects during fan-free games.

# Market Developments

## Producing and Managing Immersive Content

### Live Sports behind closed doors

#### OZ Sports uses Augmented Reality to put football fans at the heart of closed-door broadcasts

OZ ARENA tech can either replace the stadium entirely or augment viewers into existing empty stadiums. Below is an example of a full stadium augmentation.



Image credit: OZ SPORST

# Market Developments

## Producing and Managing Immersive Content

### xR workflows for live production environments

disguise Extended Reality (xR) workflows empower production teams to deliver Augmented and Mixed Reality within live production environments.



Source: disguise.one

xR workflow allows a presenter, as well as the audience, to see and interact with the content around them by using elements of augmented and mixed reality within live production environments. It combines camera tracking, content being rendered in real-time, creating virtual environments, which is visible on the screen, as well as on the live set and directly in-camera.

Within broadcast, xR can generate a limitless environment within a physically small space. The screens within the space only need to be as large as the performance area; and features such as 'virtual set extensions' placing the actors in environments outside of the physical studio itself.

### xR workflows for live production environments



Source: Newcast Studio

Chilean broadcaster Canal 13 used augmented reality to help highlight key facts about the coronavirus. The network had been planning to roll out Vizrt powered AR technology for the country's upcoming April elections but the growing coronavirus outbreak pushed the broadcaster to adopt this technology sooner.

# Market Developments

## Producing and Managing Immersive Content

Arabic broadcaster Alghad TV has created an immersive augmented reality segment showcasing a new Type 209 submarine. The segment used Unreal Engine to provide photorealistic rendering.

Sky News Arabia created an AR segment that showcases how travel may change in a post-COVID-19 world. The segment was created using Zero Density's Reality platform with rendering from Unreal Engine.



Source: Newcastle Studio

Filmed at Studio4 in Hilversum, the event was broadcast live online and later aired in cutdown form on RTL Z. Virtual design was handled by NEP with Zero Density's Reality platform powering the look and utilizing the Unreal Engine for rendering.

The annual Philips Innovation Awards in the Netherlands went virtual for its recent live stream webcast. A complete virtual set was designed in partnership with NEP Netherlands to keep running events during the social distancing times.



Source: Newcastle Studio

# Market Developments

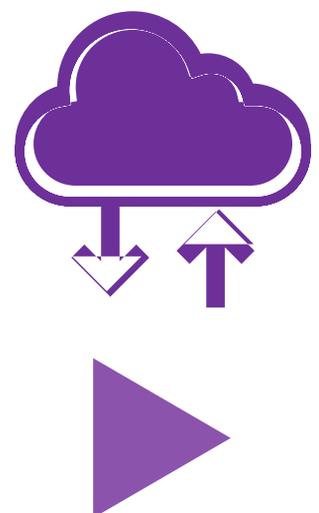
## Producing and Managing Immersive Content

**VR content production is notably complex** and differs substantially from traditional television production - from both a storytelling and a technical perspective. For example, in VR productions, every point of a studio is in view, requiring directors to exit the room. In post-production, 360-degree video needs to be stitched together before editing. In sports production, things are even more complicated; VR cameras need to be as close to the game as possible as they do not zoom. This challenge is exacerbated in large field sports such as football. VR production should take into account many factors, such as the size of the audience, distribution platform, level on interactivity (the amount of control given to a user), different user types. The challenge with UX is to find a compromise between spending extra working hours and delivering a comfortable user experience to a viewer.

**On the positive side**, with the extensive pre-production and shooting, **limited post-production is required, saving costs.**

Many issues remain for virtual reality, including the consumer experience, technology, and production techniques, not to mention the business models justifying the expense of the technology.

One of the **technologies that can be used for monetization and help to accelerate VR adoption** is a **cloud AR/VR streaming technology**. It generates different benefits for users (higher quality of the immersive experience), manufacturers (reducing adoption barriers like price and ease of deployment), AR/VR application providers (can be deployed on any device that supports the lightweight client/streaming codec), and operators (leveraging the low-latency connectivity of 5G).



# Market Developments

## Distributing Immersive Content

When it comes to VR deployments, most VR applications have focused on live sports. Hence, spending on VR technology has so far been correlated with the occurrence of important live sporting events such as the FIFA World Cup.

However, in sports applications, VR production can be extremely complex: cameras need to be as close to the game as possible as they do not zoom. The degree of complexity is often dependent on the type of sport covered. For example, large field sports such as baseball and football present more challenges. In its coverage of the NBA, NextVR has not been able to add as many cameras as it would have liked to due to safety concerns.

From a storytelling perspective, VR content needs to take into account various issues, including viewers' potential motion sickness during the experience. Today, NextVR is one of the leading VR technology specialists in broadcasting along with Jaunt VR. NextVR often provides VR experiences for broadcasters through its app that can be downloaded on a variety of VR devices.

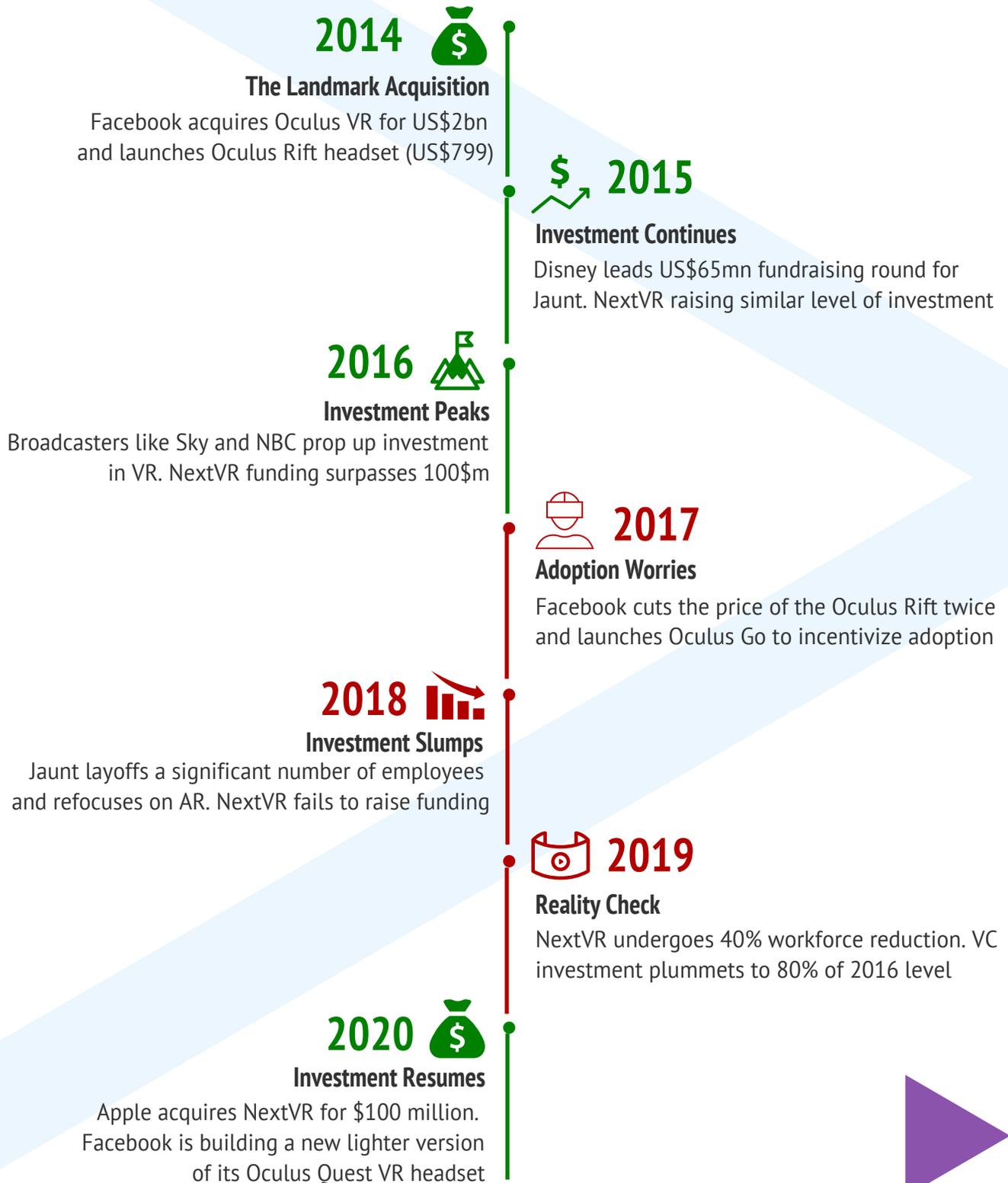


# Market Developments

## Distributing Immersive Content

### VR Timeline

The timeline below illustrates some of the milestones of VR technology.



# Market Developments

## Distributing Immersive Content

### Apple's acquisition of NextVR

In May 2020, Apple Inc. confirmed its acquisition of NextVR, a technology start-up and a pioneer in broadcasting sports and entertainment. NextVR was acquired by Apple in a deal reportedly worth \$100 million. The acquisition may help Apple's development of VR and AR headsets with accompanying software and content. The company currently provides VR experiences for viewing live events with headsets from PlayStation, Oculus, HTC, Microsoft, Lenovo. It has dealt with sports leagues, including the National Basketball Association and entertainment networks such as Fox Sports. NextVR also has expertise in live streaming in virtual reality, which could also be useful for live concerts and games.



Source: [iphoneincanada.ca](http://iphoneincanada.ca)

# Market Developments

## Distributing Immersive Content

Year			Details
May 2020	 		Apple Inc. confirmed its acquisition of NextVR, a technology start-up and a pioneer in broadcasting sports and entertainment.
Late 2019	 		NextVR and the NBA extended their agreement.
2019			Weavr, an immersive platform, has been streaming sports and esports since last year assisting the European Sports League (ESL). Viewers can watch a game of Dota 2, with a war table in front of them showing heroes prowling across the map, and a massive screen above that showed the gameplay, including game stats.
December 2018			The production company MelodyVR announced its first own live VR broadcast focusing on music. The company streamed Liam Payne's performance from a secret location that fans watched via the MelodyVR app. The company might be focusing on live musical content in the future.
2018	 		During the 2018 FIFA World Cup in Russia, Fox Sports & LiveLike provided four matches in VR through Oculus Go and Gear VR headsets.
2018	 		NextVR covered the International Champions Cup, a summer football tournament, in VR.

# Market Developments

## Distributing Immersive Content

Year			Details
July 2018			Copa90 announced a new partnership with NextVR. The International Champions Cup match between AC Milan and Manchester United was the first virtual reality live broadcast. NextVR also had a dedicated Copa90 channel through its app, debuting with behind-the-scene access to US soccer star Christian Pulisic. However, later in 2018, NextVR announced that it had laid off 50% of its staff after failing to raise a Serie C funding round.
2018			NBC covered 50 hours of the Pyeongchang Winter Olympics in VR. As opposed to the Rio experience, NBC broadcast some of the VR content live and supported more VR consumer devices, including Google Daydream and Windows Mixed Reality headsets. NBC has relied on Intel True VR technology to produce an interactive 360-degree VR experience - accessible through the NBC Sports VR app. This has given viewers the possibility to modify their vantage points, interact with games' stats, and access the natural sound captured by each camera.
2018			Intel and Turner Sports returned for the 2018-2019 NBA season with virtual reality broadcasts via NBA on TNT VR app. It is available for Oculus Go and Samsung Gear VR headsets, bringing the fans onto the virtual set of Turner Sports with access to replays, live game action, and highlights.
2018			During the 2018 Olympic Games in Pyeongchang, Intel's True VR provided the first-ever live virtual reality broadcast. Intel's True VR technology was expected to be used to create immersive experiences for some sports and venues during the 2020 Summer Olympic games, including the opening and closing ceremonies, track and field, gymnastics, boxing and beach volleyball. The content was to be distributed by rights-holding broadcasters.

# Market Developments

## Distributing Immersive Content

Year			Details
2018			Magic Leap entered a partnership with AT&T. Later in 2019, it raised US\$280 million from NTT Docomo, the Japanese cellphone service provider. The main goal of the deal for Magic Leap is to start approaching 5G and for Docomo to provide its customers immersive media and experimental spatial computing.
2018			Sky expanded its VR platform Sky VR Studio with the ambition of building an "immersive content library", through a partnership with the VR content producer Jaunt, signed in January 2018.
2018			The BBC announced it would broadcast its first VR-driven TV show Watch This Space produced by its own in-house VR studio founded in 2017.
2018			For the 2018 World Cup, the BBC offered the possibility to watch matches in VR via an app – a total of 400,000 people downloaded the BBC World Cup VR app.
March 2018			In Spain, Vodafone Espana showed to a limited audience its ability to stream VR by broadcasting one program of its YouTube networks, called YU, through its 4G network.
2017			Deutsche Telekom launched The Magenta Musik 360, a platform that enables VR viewing of live shows;
2017			The partnership between NBA Digital and NextVR marked the first time VR technology was monetized in broadcasting. The two organizations partnered to deliver a game a week in VR, which was charged to consumers through a subscription model (the NBA League Pass).

# Market Developments

## Distributing Immersive Content

Year			Details
2017			Fox decided to collaborate with LiveLike on a "social" VR experience for the CONCACAF Gold Cup, where viewers were able to communicate with each other through the Fox Sports app, while watching the games.
2016			NBC provided 85 hours of the 2016 Rio Summer Games' content in VR - for the first time ever in a Summer Games broadcast. Viewers could watch the VR broadcasts through the NBC Sports app using only the Samsung Gear VR headset together with a Samsung Galaxy mobile phone.
Feb 2016			Fox Sports and NextVR signed a five-year deal to develop virtual reality offerings for sporting events broadcast on Fox Sports. The day after the agreement was signed, the partnership produced and distributed the Daytona 500 NASCAR race.
Feb 2018			Finnish broadcaster uses AR to teleport commentators to Helsinki

# Market Developments

## Distributing Immersive Content

### Finnish broadcaster uses AR to teleport commentators to Helsinki

YLE, Finland's national public service broadcaster, teleported its 2018 Winter Olympics commentators back to Helsinki for studio debriefs, using technology from Keho Interactive with rendering through the Unreal Engine. Broadcast Solutions GmbH, ZD's partner in Finland brought an interview to Finnish audience of Streamteam /Telia from 200km away.



Image credit: NewscastStudio

# Market Developments

## Distributing Immersive Content

More live music events are now available in VR, including major Summer festivals like Openair Frauenfeld 2018 and Parookaville 2018.



These use cases highlight how VR technology is so far making inroads largely just into sports broadcasting. However, according to recent IABM data, most end-users still do not know how to monetize it. VR technology needs to find a clear business model to back it as most deployments rely on the free broadcast to viewers through apps.