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Changing the face of the broadcast sector

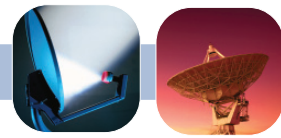
The broadcast industry has been home to a lot of change in the last decade, as increased digitalisation, the transition from SD to HD and now 4K, and the rise and fall of 3D have all changed the face of the market irreversibly. One of the newest major market disruptors is virtual reality (VR). With an increasing number of households owning VR headsets and devices, and broadcast-grade cameras capable of capturing VR content entering the market, it's only a matter of time before the satellite broadcast sector sees some major disruption.

There's been a great deal of change in the fixed satellite service (FSS) market in recent years, particularly in the broadcast area. Following the small rise and massive fall of 3D, consumers and content companies have been much more excited about the spread of 4K across the world. TV manufacturers have jumped at the chance to sell more highly-priced stock, while broadcast satellites anticipate higher capacity utilisation thanks to the bigger files being transmitted.

The latest 'big thing' for the broadcast sector is virtual reality (VR). The idea was first conceptualised in 1935 by science fiction writer Stanley G. Weinbaum in his short story 'Pygmalion's Spectacles.' The story bears similarities with VR systems today, since headsets/goggles are the most popular and well-established viewing devices right now. Other viewing

options include computer monitors, projector screens and tablets. In order to fully immerse the viewer, many systems now include earphones for audio information, while vibrations can be sent to the headset to enhance the experience. In some cases, particularly video games or military training applications, users have handheld devices with which they can interact with objects inside the VR world.

VR is a fantastic opportunity for the broadcast sector in the Western world; as for 4K transmission, VR content requires massive bandwidth volumes, and, since VR goes hand in hand with 4K for a more convincing simulation, the files are only getting bigger. This provides a new boost to broadcast satellites in terms of capacity utilisation, in addition to terrestrial fibre broadcasters.



Deloitte Global has predicted that the VR market will have its first billion-dollar year in 2016, with US\$700 million in hardware sales and more than US\$300 million from content expected. Around 2.5 million VR headsets and 10 million games are expected to be sold. However, Deloitte Global expects that VR will take time to make an impact on the TV and broadcast market since little content is available yet. Another market limitation is the fact that broadcast-grade cameras capable of recording VR content are only just entering the market, and are currently price-prohibitive.

Developing the technology

The VR market is very much in its infancy, and we're only just beginning to see what might be possible. Those active in the market have estimated that it may be several years yet until commercial roll out is achieved, and it's important in the meantime that hardware be perfected to be both affordable and high-functioning. The production of content must also be a high priority, because, as with 4K, consumers are unlikely to buy new hardware if the content does not exist.

For the consumer, VR headsets are one of the most important pieces of hardware, and today companies are making headsets for every corner of the market. At the top end, Facebook's Oculus Rift and HTC's Vive serve the market, with the more affordable Samsung Gear VR in the middle, and Google's Cardboard at the bottom end of the price bracket. In October 2016, Sony released the latest entrant to the headset market, its PlayStation VR headset, which is designed to plug into the PlayStation 4, and meets middle market demands. Right now, one of the biggest trends in VR headsets is the creation of standalone devices, which do not need to be tethered to a computer or console to operate. Facebook, Intel, and Qualcomm are all working on such devices.

It's also important to hone VR video broadcasting techniques; a viable way to distribute VR content to consumers is vital for market success. At IBC 2016, SES and Fraunhofer HHI demonstrated the transmission of a 10K x 2K panoramic video to a 4K display and VR headsets from the SES Astra satellite. The transmission required 22-30Mbps of bandwidth. With the technology, consumers were able to pick their own viewing angle and device of choice.

Speaking after the event, Thomas Wrede, Vice President Reception Systems at SES confirmed that the virtual reality demonstration had been a big hit. "VR applications work very well over satellite," said Wrede, "and visitors at our IBC exhibition stand were thrilled experiencing the VR 360 showcase that we had set up jointly with Fraunhofer Heinrich Hertz Institute HHI Berlin. SES is certainly going to continue exploring VR technology and respective broadcast applications."

According to SES, the technology remains in its infancy, and is 3-5 years away from commercial deployment, at which time headsets should be easily affordable and high spec. The company plans to build the ecosystem first and then roll out the content, with a focus on live sports events and concerts.

"Satellites are the perfect distribution path for these new kinds of video experiences, as they can manage huge volumes of data being offloaded from terrestrial networks. Furthermore, technology standards like SAT>IP not only allow the viewers at home to pick and choose a device – the TV screen, tablet or virtual reality equipment," said Wrede.

Beyond the technology, it's equally important that

engineers, developers, marketers, and anyone who might be involved in the VR market be equipped with the appropriate training. A shortage of talent could be a major limiting factor to VR market development.

As such, in September 2016, online education platform Udacity launched a new course for VR developers in conjunction with Goggle, HTC and Upload. The VR Developer Nanodegree will enable students to learn how to make VR experiences immersive on mobile phones and computers, working on game engines, design, user interaction, performance, ergonomics and more. The course costs US\$199 per month, and 50 percent of the charge is refunded upon successful completion.

"Even with more than 50 million installs of Google Cardboard apps on Google Play, these are still the early days of VR," said Nathan Martz, Product Manager at Google VR. "Students who complete the VR Developer Nanodegree learn by doing, and will graduate having completed a portfolio of VR experiences."

Assessing the market

With any new technology, it's important to test the market before fully committing. Many companies expected great results when 3D TVs hit the shelves near the start of the decade, however, the outcome was not as planned. Uptake by consumers was poor, and 3D is slowly disappearing, with fewer 3D Blu-rays available in shops, and fewer 3D films being shown at cinemas. With VR, content producers and distributors are being warier, and taking greater care to fully assess the market with pilots and trials before taking the plunge.

In October 2016, IMAX announced that Europe's first VR entertainment centre would open in Manchester, UK by the end of 2016 as part of a six-city pilot scheme to test customer demand. The centre will deliver 'immersive, multi-dimensional VR experiences, including entertainment content and games,' according to IMAX. Content will be delivered in 5-15 minute segments, costing £8-10 each. The modular design will enable different users to use individual pods to experience the content at the same time, and the pods will be large enough for users to move about and interact with their surroundings.



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Other pilot centres will be opened in the USA, China, Japan, the Middle East and Western Europe, each with a six-month duration. "If successful, the intent is to roll out the concept globally to select multiplexes as well as commercial locations such as shopping centres and tourist destinations," said IMAX.

According to IMAX, Hollywood studios are keen to invest in VR. Film distributors and exhibitors consider VR as an additional source of revenue, which complements traditional films, rather than providing an alternative. However, it is important that the technology is durable enough to last the long-haul. "I'm not really interested in putting the IMAX brand and resources into a fad, so we want to really make something that is sustainable," said Richard Gelfond, CEO of IMAX. "There are a lot of reasons to go slow and not be a first mover in VR, but given IMAX's experience in technology, the power of our brand, our relationships with studios and exhibitors, I thought that if anybody was going to go first it should be us, but I have no pretence – we don't have all the answers. I think it is going to evolve in its own way and I just hope we are part of the right way."

Sky has been investing in VR capabilities since 2013, when it started filming some Premier League games and other events with VR cameras. In October 2016 it decided to test the market with the launch of its new Sky VR app, which will distribute content over iPhone and Android platforms to VR headsets like Google's Cardboard, Samsung's Gear VR or the Oculus Rift. The 'short experiences' will include clips from the red carpet at the Star Wars premier, a sports exhibition, and 2015 science fiction film *'The Martian.'*

Sky believes that VR might be the next step in home entertainment, and as such is experimenting with different options, and testing how viewers respond to the new app. The company will add new content every few weeks, most lasting less than 10 minutes, from a mixture of Sky and third-party producers. Currently, Sky is restricting content due to the motion sickness challenges that are notorious among VR broadcasts.

Live streaming VR

Live streaming already plays a major role in many broadcast operations, particularly when it comes to disaster, sporting or music events. With this method of consumption already customer-proven, live streaming with 360 degrees VR capabilities is the next logical step.

The Rio 2016 Summer Olympic Games, for example, was the first time the Olympic Games was broadcast in VR. NBC Olympics made 85 hours of VR content available to authenticated users of compatible Samsung Galaxy Smartphones and the Samsung Gear VR headset in August 2016. The programming, provided by the Olympic Broadcasting Services (OBS) included footage from the opening and closing ceremonies, as well as key content from basketball, gymnastics, track and field, beach volleyball, diving, boxing and fencing.

Meanwhile, in September 2016, NBC and AltSpaceVR partnered to live stream the USA Presidential debates between Donald Trump and Hilary Clinton in 360 degrees VR. The partners have also recreated New York City's Rockefeller Center in VR and renamed it the Democracy Plaza, where VR viewers were able to participate in 'debate watch parties,' where they could chat with other participants and participate in live question and answer segments with political experts. In addition, TV personality Al Roker was

recreated in VR to host a kick-off event in the Democracy Plaza, where he participated in debates and answered questions from the audience. Viewers without headsets were able to watch the VR presentation in PC and Mac computers, albeit in 2D.

October 2016 saw Hotstar live stream the Kabaddi World Cup games in stereoscopic 3D VR from Ahmedabad. Consumers were able to view the content via a VR headset in 3D VR, in 2D VR with a user-controlled experience for those without headsets, in addition to its traditional broadcast streams on its iOS and Android applications. The games were shot in stereoscopic 3D using two camera pods with 12 cameras per pod.

Speaking ahead of the event, Holstar commented: "The VR experience will allow sports fans to get a complete panoramic view of the game and the stadium using touch and gyroscope. Fans will be able to switch between different cameras in a 360-degree experience, thereby taking full control of their experience."

To infinity and beyond?

There seems to be no stopping the VR market. Everyday consumers and technology enthusiasts alike are excited for the consumer launch of VR. Even so, we're really only just starting to break into the possibilities that VR might bring to the world.

In August 2016, SpaceVR signed a launch agreement with NanoRacks to send Overview 1, the world's first VR camera satellite, into space. Overview 1 will be delivered to the International Space Station (ISS) on the SpaceX CRS-12 mission, from where it will be deployed into low Earth orbit (LEO) from the NanoRacks CubeSat Deployer (NRCSD). Equipped with 4K sensors, Overview 1 will record 360-degree video content of Earth, which will be viewable on any VR-enabled device.

"My dream, when I first had this idea at a hackathon 1.5 years ago, was to launch a VR satellite with NanoRacks. It seemed crazy and borderline unachievable. Now we are signed, paid, and moving towards something exponentially more borderline unachievable," said Ryan Holmes, Founder and CEO of SpaceVR. "This is the most important milestone to date for SpaceVR and we're honoured to share it with a group of pioneers that have been pushing what's achievable since before we were born."

With VR, the possibilities seem truly endless. ■



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