Virtual Reality and Video

How the least-interactive VR application will eventually lead content revenues
Summary

In brief
VR (virtual reality) video content will generate revenues of $8.2bn by 2020, according to Ovum’s upcoming VR content revenue forecast, and yet there is still confusion around what types of video will work in VR and how anyone will make money from this space – especially considering that almost all content at the moment consists of free demos.

Ovum view

- **VR video and not gaming will be the most used VR content.** While the early focus (especially for expensive dedicated home VR headset owners) will be on games and interactive experiences, these are expensive to produce and target a niche audience. In contrast, video can be recorded and streamed near-live and everyone with any type of VR headset will watch some video.

- **Do not confuse 360-degree video and true VR video.** Much of the early 360-degree video showcased on Google cardboard-type devices is not stereoscopic, so while you can look around, you are not using the unique 3D capabilities of headsets. So while fine for landscapes, it makes closer objects appear flat and distorted. Many 360-degree cameras are similarly limited. VR video, by definition, should be stereoscopic, though this is somewhat more difficult to produce than low-end 360-degree video.

- **Venue-style VR video will be most people’s first experience.** Firms like IMAX are investing heavily in VR cameras, production capabilities, and new venues to tap into the consumer’s interest in VR. Theme parks are also investing heavily in VR to supplement their thrill rides. These businesses have the advantage of being able to build the headsets into the venue, subsidize the cost of filming/production, and make money from the content without having to wait for a commercial marketplace to evolve. They can also experiment with cutting-edge technology like Starbreeze’s StarVR headset.

- **Computational photography will blur the line between video and interactive entertainment.** VR video will always be more limited than wholly computer-generated 3D VR environments, as you cannot pick your own course through a scene. However, computational photography is set to overcome some of these limitations in the longer term and, ultimately, will make it difficult to distinguish VR video from interactive experiences.

Recommendations

- **Infrastructure owners: Get ready for a massive surge in user-created 360-degree video.** 360-degree cameras are now widely available at consumer-friendly prices ($200–$400) – some are even stereoscopic. Expect owners of new VR headsets to embrace 360-degree videos as they have done selfies, drone photography, and Instagram.

- **Content creators: Create content for revenue, not just promotion.** We have yet to see a market for VR video emerge, but content creators and owners are already experimenting with VR for promotion purposes. These firms need to start focusing on content that consumers will actually pay for as headset user numbers ramp up and marketplaces are created.
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- **Publishers and content platforms:** Balance promotion, subscription, and potential advertising revenue. Inevitably much original content will be aggregated into channels and stores run by studios, digital media players (YouTube), or pay-TV firms. A careful balance will need to be struck between free teasers, incremental paid-for VR content, and charging for premium VR video productions. Ultimately, an advertising-based model will ease this pressure, but requires a critical mass of headsets and viewers.

**VR video revenue forecast**

**VR video will be worth $8.2bn by 2020 globally**

Ovum forecasts that VR video will generate revenues of $8.2bn by 2020, which is impressive given that today consumer revenues around VR video are effectively zero – most content is either brand promotion, personal video, or technology demos. It also means that video will surpass videogames as the number one revenue category within VR in 2019, as millions of consumers get portable mobile headsets and spend modest sums on content.

**Figure 1: Forecast of VR video revenues, 2015–20**

![Graph showing forecast of VR video revenues, 2015–20.](image)

**Source:** Ovum

**Five forms of VR video**

Despite this massive growth in revenues there is still a lot of confusion around what types of video are available and suitable for a VR treatment. Fundamentally, the following five types of video can be used in conjunction with VR headsets:

- **Normal SD/HD video in a VR environment.** Essentially, this is the kind of service Netflix and Hulu have already announced for a variety of VR platforms, and is the killer app for "virtual cinema" headsets like the Avegant Glyph. When the user puts the headset on they can place themselves in a virtual environment (cinema, plush apartment, on the moon) with a flat
"screen" in front of them on to which a video stream (SD or eventually HD) can be rendered. Aside from some application architecture for VR controls and the environments, this is pretty much like streaming video to a tablet or smartphone – user authentication, frame rate, and catalogue are key. VR does offer some interesting future opportunities here, such as shared viewing with friends regardless of their location, and Minority Report–like navigation between video streams and services (tantalizing for sports fans wanting to watch multiple games or fiddle with replays).

- **"3D film" in a VR environment.** An extension of normal streaming video would be to use an existing 3D film source for viewing. This would not be as immersive as a true VR video, but more like an "embossed" version of a flat 2D film – or like one of those pop-up greeting cards – so you would not be able to move around the back of the scene even on rails. Given 3D film has largely failed in the home and been relegated to cinema experiences, this is never likely to be a major usage scenario – especially given how clumsy the 3D films will look in VR.

- **360-degree video.** Opinions vary as to whether much of this should really be called VR video – while it is the single biggest application for mobile and promotional VR headsets and what most 360-degree cameras capture, most of these videos are not stereoscopic. This means you are effectively filming all around you (even above and below in some cases), but generating a standard 2D video. So watching these videos is like sitting in a fishbowl with video "pasted" on to the interior surfaces. It works great for landscapes and long shots, but falls apart as soon as objects/people are nearer as there is no depth perception.

- **Noninteractive/on-rails immersive VR video.** The most common type of VR video will be on-rails experiences where a cameraperson has used a 360-degree stereoscopic camera to capture a scene. You will be able to "move" through the scene as it progresses, and look around and focus on different areas of the video, but you will not be able to interact in any way with its contents. Most of the early VR documentaries and shorts work like this. Alternatively, you may be presented with multiple locations that you can "hop" between to view an event (for example, track-side, bleachers, and sky-cam in a sports arena). Incidentally, the term "on-rails" comes from videogames – "on-rails" shooters like Time Crisis or House of the Dead – popular light-gun games that did not give you any control of where the protagonist went.

- **Fully immersive VR video.** To truly utilize the VR platform, video should be fully interactive, where you can walk around in a scene as you please – more like a play or art installation than film. So far this is not really possible from a technical perspective, as the players would have to be rendered on the fly rather than pre-packaged. Computation photography offers hope here, but is still largely a theoretical space with a few pioneers like Lytro and more recently Intel leading the charge. This also raises questions about the structure of entertainment – how can you successfully advance a story if you are not sure the viewer is looking at the right thing. This form of VR video is getting to the point where it will be indistinguishable from VR gaming/interactive experiences.

### Table 1: Comparing forms of VR video

<table>
<thead>
<tr>
<th></th>
<th>HD video in VR environment</th>
<th>3D movie in VR environment</th>
<th>360-degree video</th>
<th>Noninteractive immersive VR video</th>
<th>Fully immersive VR video</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stereoscopic?</td>
<td>No (though the environment is)</td>
<td>Somewhat (though the environment is)</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Headset compatibility</th>
<th>All</th>
<th>All</th>
<th>All</th>
<th>All</th>
<th>Higher-spec devices only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interactive?</td>
<td>Somewhat – view multiple videos and &quot;move&quot; between them, but actual video is noninteractive</td>
<td>No</td>
<td>No</td>
<td>Somewhat – multiple camera locations at an event that you can &quot;teleport&quot; between</td>
<td>Yes</td>
</tr>
<tr>
<td>Content</td>
<td>All video</td>
<td>All 3D video</td>
<td>360-degree camera capture</td>
<td>VR camera capture</td>
<td>VR camera capture, processing, and computational photography</td>
</tr>
<tr>
<td>Great for</td>
<td>Shared viewing of traditional video</td>
<td>3D films</td>
<td>Landscapes</td>
<td>Live events, concerts, and sports</td>
<td>Complex storytelling and historical re-creation</td>
</tr>
<tr>
<td>Ease of creation</td>
<td>Just need the virtual-cinema app</td>
<td>Just need the virtual-3D cinema app</td>
<td>Easy using cheap consumer cameras and simple stitching tools</td>
<td>Moderately easy using professional/prosumer VR cameras and editing platforms</td>
<td>Difficult – requires technologies and techniques still barely out of the lab</td>
</tr>
</tbody>
</table>

Source: Ovum

**Content creator challenges**

Regardless of the type of video one produces for VR, new challenges will be introduced around editing, storytelling, and duration. Briefly:

- **Video needs to be a series of long continuous shots – or made to look like it.** Counter to modern trends in action-based TV and film production, fast cuts and rapid changes in perspective do not work in VR. Effectively, VR video is mimicking how your eyes work – and unless you suffer from blackouts, fast cuts rarely happen in real life. For scenes filmed from multiple VR cameras, you can just about get away with user-controlled "teleporting" between these views, provided they all focus on more or less the same subject (e.g., a basketball court). Naturally this will affect pacing and storytelling – single-room dramas (often based on theater plays) work well, as do sports and "landscape" photography.

- **You cannot predict where a viewer's attention is at any one time.** For scripted video, a more serious problem is how you advance the plot when you have no idea if the viewer is looking where they are supposed to be when vital actions or dialogue take place. Until we get to truly interactive VR video – where action can be triggered specifically when a viewer looks at something or moves to a predefined section of a scene – this will be challenging. Two work-arounds for this problem show promise: restricting the viewer's mobility (for example, *Catatonic*, the "virtual reality experience" where you are strapped into a wheelchair) – which somewhat defeats the point of VR's freedom – or using a companion as a guide to direct the viewer's attention.

- **There is a 20- to 30-minute duration limit.** Aside from battery and overheating concerns that will continue to plague mobile VR headsets, for most people 30 minutes of VR video will be all that they feel comfortable watching in one session. Remember, you do not know what is going on around you and, in most cases, need to sit fairly still as you watch. Much like listening to a lecture, it is difficult to sustain your concentration for more than 20 minutes.
Gaming, of course, is far more interactive and keeps the player busy, so will see longer usage sessions from the outset.

Key players

There are five types of companies who have thus far engaged in VR video:

- **Camera manufacturers.** The big advantage of most of the simpler forms of VR video is the ease of creation (certainly compared to fully interactive experiences that may take years to develop). Many firms are now focusing on building the cameras to capture that VR video footage. These range from firms like GoPro, Samsung, and Sphericam who produce cheap 360-degree (mostly monoscopic) consumer cameras, up to professional camera builders like Jaunt, NextVR, and Eye. Many of these manufacturers – especially on the professional side – also have platforms to allow image/video stitching (i.e. joining up all those different video feeds), editing, and potentially computational photography in the future.

- **Content creators.** Obviously this will ultimately be the most important element in convincing consumers of the worth of VR. Creators range from established studios experimenting with the medium (AOL, HBO), to dedicated VR producers (Jaunt, VRWerx, Within, and NextVR), some of whom offer end-to-end services from cameras, through production to platform.

- **Platform owners.** There are two significant hurdles for content creators: the "stitching" and editing process, and getting content into a suitable form for various headsets. Platforms from firms like Jaunt, Google, and Oculus aim to make this easier by providing tools, APIs, and back-end cloud services. The battle for who becomes the dominant platform will be hard fought, given the essential position in the value chain that it occupies.

- **Shopfront owners.** Without a decent route to market and monetization strategy it does not matter how good your content is. To date we have not seen any compelling VR video stores emerge – rare paid-for content is still distributed either by a dedicated app (which is not scalable) or purchased directly from creators (which is not efficient). While not the only way content creators will make money (see below), firms like Samsung, YouTube, and Sony would all like to become the de facto shopfront for VR video.

- **VR headset makers.** This is the easiest to understand and probably the most established area of VR. Familiar names like Oculus, Valve, and PlayStation on the dedicated home-headset side sit alongside firms like Samsung, ZTE, and LG on the mobile-headset side, and will soon be joined by a raft of Chinese manufacturers like Pico, AntVR, DeePoon, and LeTV. All of them work on the basis of carving slim margins from hardware sales.

Likely business models

While we wait for a critical mass of VR headsets to reach consumers around the world, we will have to be satisfied with free, promo, and user-generated VR video. But with almost 150 million headsets forecast to be in consumers’ hands by the end of 2017, this will not take long to change. We foresee the following four main business models for charging for VR video:

- **Subscription.** The easiest model to understand. A content provider – which could be a pay-TV firm, an over-the-top (OTT) TV service like Netflix, or even a new theoretical entity like...
"Kardashian VR" – charges a small monthly supplement on top of a standard subscription for access to VR content. As with all subscription models, this has the advantage of a predictable regular income for the provider, but requires a regular influx of new content and turns off consumers who just want one "quick hit" of a video or interactive experience.

- **Transaction (electronic sell-through [EST] and streaming).** The one-off electronic transaction is the other common model in today's TV and film market. Consumers pay a fee to either download a digital copy of a video (i.e. EST) or interactive experience, or they pay to stream a video (i.e. rental). This can be combined with subscription offerings if extra premium VR content is available, but risks alienating subscribers if abused. While not as predictable as a subscription model, there is more potential upside if you have a massive hit, but you have to convince consumers to commit to a transaction – probably through whatever stores end up being dominant in VR.

- **Purchasing physical media.** While seemingly old-fashioned, physical media will still have a role to play in VR content. PlayStation VR games will have physical editions, as will some premium VR video due to broadband bandwidth constraints – indeed these constraints will get worse as VR moves up to 4K resolutions.

- **Advertising revenues.** While successful advertising in VR will have to wait for a critical mass of viewers, it has a number of key advantages over traditional video advertising that brands will want to take advantage of:
  - **You cannot walk away from the advert.** Unlike a TV or even online pre-roll advertising, consumers will not take off their headsets while ads are on – it takes too long and is fiddly – so you have a captive audience.
  - **It can be subtle and nonintrusive.** Given a captive audience, it is more important than ever to not annoy the viewer. VR allows ads to be positioned off to one side or pulled down, or only displayed on in-environment billboards, which are far less intrusive than on-screen idents, pre-rolls, and pop-ups (though doubtless these will be present too).
  - **The nature of the medium will allow new forms of advertising.** In the interactive experience, advertising can become a core part of the story – product placement, 3D models, and engaging with brand advocates could all be interesting in VR.

Incidentally, advertising revenues are not included in our upcoming content revenue forecast as it is not direct consumer spend, but a B2B transaction between brands and their ad agencies, and advertising networks. Note also that cinema and venue VR are not included either to be consistent with other Ovum forecasts focusing on in-home/consumer-owned equipment and direct consumer digital media revenues.

**Appendix**

**Methodology**

This report uses both the VR headset forecast and the VR content revenue forecast to flesh out the VR video space in numbers, along with interviews and input from key players in the ecosystem.
Further reading

VR Content Revenues Forecast: 2015–20, (upcoming)

VR Headset Unit Sales, Installed Base, and Hardware Revenue Forecasts: 2015–20, TE0004-001080 (May 2016)

VR Tracker 1H16, ME0002-000681 (July 2016)

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