

Creating realistic experiences for virtual reality environments



There's a lot of buzz around virtual reality at the moment and consumers' expectations are high.

In a recent Vicon industry survey 28% of respondents stated that high quality content was important to ensuring a good VR experience. For VR to really take off, the industry needs to address challenges such as improving the development of accessible and high quality content.



Ensuring a good user experience

In line with Moore's Law, graphical processing capacity of off-the-shelf computers has continued to improve and this has helped push the industry forward in creating realistic VR environments. To ensure realism it's important that graphics are generated in good quality and as quickly as possible, however the VR hardware also needs to display these images properly and with the highest fidelity and lowest latency. Interestingly, the tools for generating content have been made more accessible to the mass market over the past 18 months, both in terms of cost and usability. Games engines such as Unreal and Unity are easier to use and are also much more affordable. The industry's starting to see an increase in content created by individuals and the public, rather than by games companies or large studios. Certainly the improvements in graphic processing and hardware will continue to drive forward the realism of VR content, as the ability to render an image quickly becomes easier and cheaper.

In fact we've already seen companies like Sharp develop 4K LCD screens for smart-phones and tablets and will soon reach 8K. Once VR display devices are able to integrate with these higher resolution

screens, we will again see another step change in the quality and realism of virtual environments – and developers will be able to bring higher quality content to market.

Navigating gameplay

The current head-mounted displays on the market such as the Oculus Rift and HTC Vive are designed for living room sized tracking environments. For VR to become accessible to the mass market the industry must address the challenges it faces in the scalability and tracking of larger spaces. Looking from the ground up will help developers design content for VR devices, they will really need to focus on new approaches to game navigation, control and interaction. The adoption of VR in general will be limited by the quality of the user experience, if the developers cannot think of new ways to control gameplay then consumers will be reluctant to uptake the technology.

Cross platform development

Although over half of the respondents in our recent VR survey, thought that it would take three to five years to set sufficient standards for cross-platform development, it may well be sooner, since engines like Unreal and Unity allow developers to create content that encompasses the whole development process; narrative, assets and gameplay. They are then able to deploy the game very easily over multiple platforms, for example Windows, Android, Apple and of course, consoles.

The process of creating VR experiences cross-platform will come seamlessly because the game engines currently on the market already have this capability in place and are being used to distribute content for traditional games. It may well take one or two years for that to start following through, but the infrastructure is already in place for VR.

What does the future hold for VR?

As game engines become more accessible to the mass market, the VR industry will see more content being created by smaller developers and individuals. It's a

trend which we've already seen happen within mobile app development. If you look at major app stores, a large proportion of available content is created by smaller companies. Since its introduction this model has become an incredibly successful way of distributing content and if replicated for the VR industry, the ability to deliver VR content to consumers would be made easier. As well as providing smaller developers with the opportunity to gain maximum exposure for their content.

If the VR industry adopts this model, developers will also have the ability to monetise the cost of developing apps and drive the industry forward. As we've already seen that 'in app' upgrades and payments are very successful and ways of achieving this for VR will naturally follow.

By Warren Lester - Engineering Product Manager



Q&A with Artanim



Caecilia Charbonnier, Co-Founder, President & Research Director of Artanim Foundation.

Tell us a bit about Artanim

Artanim is a Swiss research centre based in Geneva, which was founded in 2010. Artanim conducts research projects in two main areas. The original focus is in the medical research arena; where we combine motion capture with 3D medical imaging in order to better understand human joint structures, as well as using and improving the diagnosis and treatment of musculoskeletal disorders.

Our latest area of focus looks at developing virtual or augmented reality applications, with an emphasis on real-time interaction and using cutting-edge motion capture and 3D body scanning technologies.

We also provide motion capture services to game developers and 3D producers in order to help bring their projects to life. As one of the largest motion capture centres in Switzerland, we hope to make motion capture technology more accessible and encourage its use.

Why did Artanim choose Vicon as its motion capture system?

All of Artanim's co-founders have either worked or studied at the MIRALab, University of Geneva. The lab was installed with a Vicon system and has been a customer of Vicon since 2003. As a longstanding Vicon customer and having previously used the technology on a large number of different projects, the team were sure that continuing to work with Vicon was the right choice

both commercially and technically. Our use of Vicon solutions has always been reliable, precise and with super low latency which is really important for real-time applications. Vicon's ongoing continual development in all areas of motion capture, their support network via direct and through resellers, and working ethos with customers, makes it easy to choose to be a Vicon customer!

How has virtual reality changed over the last 5 years?

VR hardware and software platforms have vastly improved in terms of both choice and price point. What is really great is that they are of a quality suitable for consumers and prosumers alike – making perfect market conditions for growth, and importantly, acceptance. With VR hardware being accessible it becomes about content creation and making an amazing immersive experience. Game engines, such as Unreal © and Unity © have massive communities making accessibility to developers of VR environments considerably easier. With Vicon's continual development of their solutions, including Tracker & Pegasus, the ability of using these tools in a reliable, repeatable and robust way allows the concept of large scale multiple player VR worlds to come to reality. As VR technology become more mainstream, our ultimate goal will be to deceive the five human senses of hearing, sight, touch, smell, and taste - in a way that allows the user to believe they're in a real environment.

What do the next two years hold for Artanim?

At the moment we are preparing to launch and commercialise our spin-off company Artanim Interactive and the 'Real Virtuality' VR platform we've been developing over the last few years. The platform will allow users to become immersed in a VR scene by walking, running and interacting with physical objects and other people/characters. We're looking to deploy location-based VR experiences around the world – starting with those in the entertainment industry.

We are also trying more and more to mix our two research areas, so developing VR/AR applications for medicine. For example, we are working on a new project called Holomed that aims to develop two different tools: A VR rehabilitation platform which combines both VR and mocap in order to improve performance and motivation for patients undergoing rehabilitation. As well as an anatomical see-through tool with HoloLens for use in surgery and sport medicine. This would allow medical teams to visualise and analyse a patient's anatomy in real-time and whilst they move.

The Artanim team will be carefully following new motion capture and VR/AR developments in order to stay at the forefront of technology in those fields.