Virtually there

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Elizabeth Kavanagh and Andrew Kingdon ask whether virtual reality in construction is here to stay

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If you have been to any construction industry event in the past 18 months, you could not help but notice that virtual reality (VR) has well and truly landed, with exhibitors showing off the latest headsets and drawing you into their digital world.

But despite the hype, VR has not been adopted as a standard way of working, with one-off flagship projects led by company specialists tending to be the norm instead. As it?s been 2 years since the consumer release of key VR tools such as HTC Vive and Oculus Rift , we could well ask whether VR is here to stay as a tool or it?s just the latest toy.

Project potential

Stride Treglown, an architectural practice and building information modelling (BIM) consultancy, has been using Revit software for 15 years, and over the past 3 has embraced visual collaboration software and VR platforms to enhance the way that it designs, communicates and collaborates.

One early example of its use of VR was on the now completed ?50m Bristol Business School at the University of the West of England. This project was one of the first BIM Level 2 projects in the country and from the outset the latest VR and interactive technologies enabled a collaborative design process.

The design team started off using the navigable 3D environment tool Revizto, which was provided to the client on an iPad to let them 'walk' the full building model. Although not a tool for communicating spatial experience, it enabled easier dialogue between designers and stakeholders, encouraging the latter?s engagement in the design process.

Following this, with the release of the Google Cardboard VR platform in 2014 the design team began to produce VR walkthroughs and even used a smartphone app. This simple, affordable and fun form of VR allowed a wider range of users to download and experience the building on personal devices, and in turn generated interest about the project.

During the later design phases, advanced VR tools such as the Oculus Rift headset were used to give all stakeholders a clear understanding of the building before construction. Meanwhile, a large-scale immersion dome provided by Soluis let participants observe each other?s body language in real time, helping the design team to gauge users? feelings and adapt the design accordingly.

The use of VR has been really great in terms of engagement with the building end-users; both staff and students. I can show them furnished space and walk anywhere with them.

Marianne Reed, Head of Strategic Developments, Bristol Business School

Stride forward

Although this is just 1 example project, Stride Treglown is making VR a standard tool in its design process and has 20 live projects using the technology.

Using VR in the design process requires a move towards collaborative behaviours, since the tools enable the design team to listen to and engage with stakeholders and gauge feedback at an early stage, then adapt their proposals to suit. On Bristol Business School, for example, the team was able to listen to users? concerns about the width of a corridor giving a pinched feeling, and made appropriate adjustments.

For the team to do so on a routine basis, members need to be open to ideas and trust each other?s ability to adapt to changes, for the benefit of the client and user. So a cultural shift is required to embed VR tools: before using the technology, design team members saw the form of a building in a way that was inaccessible to the client and user, and often to others in the team.

Having a VR platform enriches the information provided and empowers the client and users to interact with space in a way that means their reactions and responses can be integrated into the decision-making process.

Anything that breaks down barriers between people and allows us to communicate on a level playing field is a vital communication tool, and we use any combination of Lego, plasticine, Post-it notes and VR alongside deep listening skills to ensure that the user and client body feel that they are heard. The team plays with the design to work up something that serves the client?s needs, and VR involves contributors in a transparent way that opens what was hitherto a closed process. We will be able to shift our thinking and decision-making processes to integrate this way of working.

The process of scanning directly to VR is now taking off as well, to the extent that large estates can create virtual models of existing assets and integrate such buildings digitally with new elements or refurbishments in a way that reflects the needs of those occupying them.

Having embraced the widespread use of building information modelling (BIM), the construction industry is well placed to take on VR, as projects often already exist digitally in 3D and can be plugged straight into virtual systems.

Serious play

Use of the technology in construction is at an early stage, and designers, manufacturers and contractors are still testing how this tool, originally designed for the video game industry, can be best used in design, construction and facilities management. We can, however, see promising signs, with contractors employing gaming technology to interact with building information models during the construction process.

The novelty of the hardware means it has initially been used in the industry as a visual presentation tool or marketing device. Consumer expectations are increasing, though, thanks to innovations such as the Ikea application that allows customers to visualise in 3D a room set in their home. VR technology could similarly be used to forge closer links between designers, users, clients and the team constructing the final building, creating a digital asset that supports those maintaining and operating the real thing.

As increasing numbers of construction projects are completed using VR, lessons are learned and benefits realised, this will inspire further confidence and encourage companies to invest more in it. Now the hardware is affordable, the key investment will be in bringing members of the design team together.

Although VR is being used more or less as a toy in construction at present, like BIM it has the potential to be a powerful tool that can help the design team encourage others to play with ideas.

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Further information

- Related competencies include Construction technology and environmental services
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