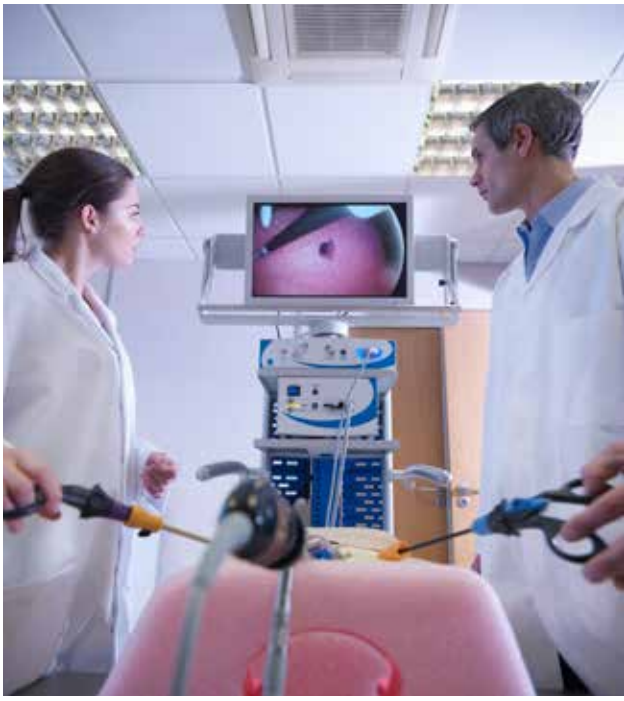
A NEW REALITY

VIRTUAL REALITY TECHNOLOGY HAS BEEN AROUND FOR DECADES IN VARIOUS FORMS. IS ITS FULL POTENTIAL IN THE WORKPLACE FINALLY ABOUT TO BE REALISED?



LIKE PERSONAL ROBOTS, hover cars and teleportation, virtual reality (VR) has long been a benchmark of advancement. It has been imagined and reimagined so many times in the entertainment world that it almost feels like it should be an everyday part of life already.

From the early Sensorama machines of the 1950s to the initial popularisation of headsets in the 1990s, as a technology VR has been around in one form or another for a long time. And while it was initially created as a vehicle for entertainment, in the 1970s it was deployed in the workplace for the first time, with applications in medicine, flight simulation and the military.

These sectors still benefit from its use, but new generations of goggles, and the increasing success of augmented reality (AR) games, have again raised the question: can VR finally have an impact on the wider world of work?

William Confalonieri, Chief Digital Officer, CIO and Vice President of **Deakin University** in Victoria, Australia, says that, ultimately, changing customer needs will drive this demand for the application of VR, AR, mixed reality (MR) and blended reality (BR) in the workplace.

"We live in an age that is characterised by customer centricity and high customer expectations of organisations' engagement processes," he explains. "Digital channels are being pushed to deliver inspiring and personalised experiences. BR presents the opportunity of taking digital intimacy to a completely new level. It still requires more maturity from the technological frameworks and in terms of usability, but it will, without doubt, change most service delivery channels."

REALITY CHECK

What is the definition of each type of virtual reality technology?

VIRTUAL REALITY
Virtual reality is an artificial simulation or recreation of a real-life environment or situation. Individuals are immersed completely, making them feel like they are experiencing it first hand.

AUGMENTED REALITY
These technologies layer computer-generated enhancements on to existing realities, allowing users to mix digital components with the real world.

BLENDED REALITY
A combination of technologies that not only offers new viewing methods, but also new methods of digital input and output. For example, users can scan real objects in 3D, and make virtual edits before 3D printing an updated version of the object.

MIXED REALITY
The merging of real and digital worlds to produce new environments and visualisations that can interact in real time.

PACE OF CHANGE

While the desire to implement VR is clearly there, how quickly is wider application in the world of work happening?

"Very, very slowly," says Professor Robert Stone, Director of Human Interface Technologies at the University of Birmingham in the UK, who has been involved in VR since 1987 and helped to launch the UK's first collaborative VR programme in 1993, fully funded by British industry. "It is disappointing to see how little things have actually progressed, despite the existence of a number of good, early case studies and evidence of real adoption, with both financial savings and end-user performance benefits, in the late 1990s and early 2000s," he says.

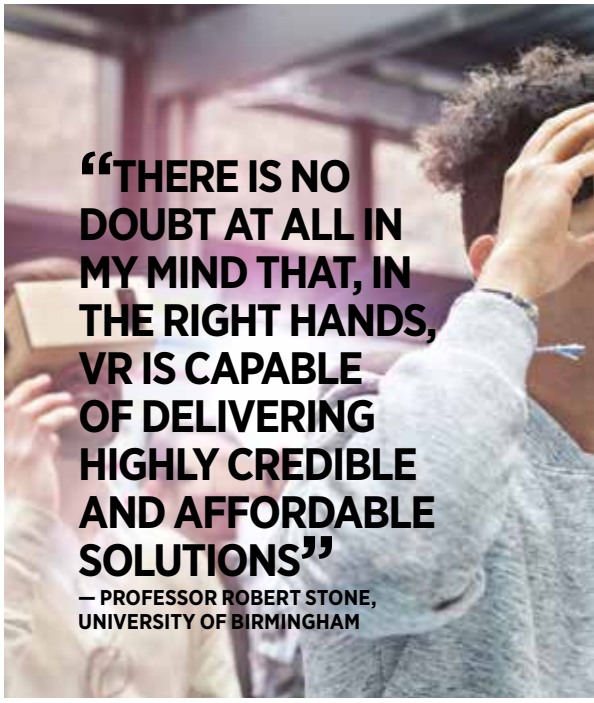
Stone warns that hardware that doesn't live up to its billing and promises from marketing departments have seen unsustainable investment in VR in the past, with technologies disappointing clients and users. And he warns that, without due care, the new generation of VR companies could find history repeating itself.

"The problem is that, today, we are seeing an almost identical rerun of what was witnessed in the 1990s, and which led to the near-extinction of VR at the end of the century," he says. "Most of the blame can be laid at the doors of the developers of the over-hyped new breed of VR hardware technologies, in particular the head-mounted display, countless variations of which now exist. Even more 'next-gen' products are announced – often prematurely – on a monthly basis."

While VR in the workplace has not yet become commonplace, Stone believes the potential is now there. "There is no doubt at all in my mind that, in the right hands – groups of independent researchers and consultants with real experience and track records – VR is capable of delivering highly credible and affordable solutions in interactive visualisation across a broad range of applications." He goes on to reel off a list that includes defence, aerospace, the maritime, automotive and railway sectors, healthcare, culture, tourism, and education at all levels. He adds that VR should be thought of as one tool in a kit, to be used in collaboration with other media, rather than as an isolated solution.

TRAINING ON TRACK

One area where VR is starting to fulfil its potential is training. In the past, the technology was reserved for training in high-risk or high-value industries such as aeronautics or engineering, but it is now being used to help teach trade skills such as painting, carpentry and welding. Programs and hardware can be combined to help employers train staff and test their abilities in lines of work that require dexterity and attention to detail.



That's not to say that high-risk industries aren't using the advancements as well. At Deakin University's School of Medicine, Confalonieri and his department have collaborated with staff to create new technologies to help train medical professionals.

"We've developed an AR app that delivers a floating, pumping heart to the student, which they can open and manipulate to understand electrocardiogram processes and heart diseases," Confalonieri explains. "Students have indicated that, with AR, they have 70 per cent more confidence in their knowledge, compared to when pedagogy was only delivered by traditional methods."

While the potential of the new generation of VR is recognised, and its use is beginning to emerge in wider workforces, are the individuals with the skills needed to implement it available to employers? Stone says that, although it's not yet the case that talent is easy to source anywhere, the situation has improved.

"This issue is not as desperate as it was in the late 90s, for example, when there was definitely a dearth of talent," says Stone. "That had a knock-on effect for many potential commercial adopters, in that they couldn't see how any investment they made in VR could be sustained."

While the necessary abilities have not yet been standardised, Stone adds that many youngsters are learning the core skills needed to make the most of VR through games and game modelling toolkits. "They're developing relevant skills very early on – building environments and games using the **Minecraft** sandbox tool, for example, or experimenting with

GETTY IMAGES

freely available modelling and games engine toolkits such as SketchUp, Unity and Unreal."

SETTING STANDARDS

If a lack of formalisation for these skills exists, what is the solution? Not dedicated academic courses, warns Stone.

"As we saw in the 1990s and early 2000s, such courses are rarely worth the paper they're written on and have the tendency to produce graduates who are jacks of all trades and masters of none," he insists. "What we do need to see – and I speak as someone who has crossed over from the commercial VR domain into academia – is the integration of VR, AR and MR modules into engineering degree courses."

Many of the engineering degree courses that are available – electronic, civil, mechanical and so on – do teach basic skills in 3D design using computer-aided design (CAD). But Stone says that the provision of appropriate degree modules or options to allow students to extend their basic 3D CAD skills remains a rarity, despite the increasing demand for such skills from across the board in the engineering sector. As with many skillsets, he insists that alternative qualifications to degrees must be provided.

"I would like to see a register of approved – and affordable – short industrial or vocational courses in VR, delivered by individuals and groups with a recognised capability and track record," he says. "The aim should be to eradicate the rather superficial hands-on VR 'parties' that are currently being offered by start-ups desperate for exposure and sponsorship." ■

THREE WAYS VIRTUAL REALITY TECHNOLOGY IS BEING IMPLEMENTED IN THE WORKPLACE

BUILDING CARS

Car manufacturer **Volkswagen** has been investing in augmented technology in the Volkswagen Virtual Engineering Lab. Using the **Microsoft** HoloLens, which allows users to bring high-quality holograms to life, the firm is using the technology to build virtual vehicles using speech and gestures to alter designs in front of them. Frank Ostermann heads the company's Wolfsburg lab. "At Volkswagen, we have been using augmented reality and virtual reality for some time, mainly to obtain a three-dimensional view," says Ostermann. "We are now taking a major step forward at the Virtual Engineering Lab. We are transforming this technology into a tool for Technical Development. This will allow Volkswagen engineers to work on a virtual vehicle, to change its equipment as they wish and even to design new components virtually. They will be able to see the results of their work immediately."

GAINING A PSYCHOLOGICAL EDGE

Visualisation experts at defence, security and aerospace company **BAE Systems** have been helping British athletes train by providing 360-degree and 3D simulations of course layouts ahead of major competitions. Simon Timson, Director of Performance, **UK Sport**, says: "Familiarity and practice in the competition environment, whether real or virtual, breeds confidence in athletes. The advantages of virtual training should not be underestimated in the pursuit of excellence. This adaptation of new technology allows us to digitally bottle that experience for elite athletes and help them perform at their best."

SAVING LIVES

Doctors are using VR and AR technologies to train for and plan operations. **Ohio University** filmed trauma scenarios using 360-degree cameras to create an immersive experience for surgical residents. Using a headset, residents experience sitting in a trauma bay to observe medical staff as they treat a car crash victim. While experiences are currently limited, the goal is to create hundreds of resources to prepare surgeons for as many scenarios as possible.