The Future of Immersive Content
Introduction

In 1968, two researchers at the University of Utah created what was one of the world’s first virtual reality headsets. Dubbed the “Sword of Damocles”, the device was so heavy that it had to be mounted to a mechanical arm attached to the ceiling, then carefully lowered over the user’s face. Although the device was able to create a virtual reality experience, graphics technology was not advanced enough to create much more than simple wireframe forms.

Today, thanks partly to advances in computer graphics, immersive technology is developing into an exciting medium in industries as diverse as entertainment, retail, education and manufacturing. And it is clear that the true potential of immersive technologies is only just emerging.

We have partnered with Digital Catapult, UK’s leading advanced digital technology innovation Centre, to take a look at their latest research in the field of immersive content. Digital Catapult, which provides acceleration programmes to support UK immersive tech companies, has recently released three exciting reports discussing key trends and opportunities for the nascent industry.

As always, Springwise aims to bring to life the ideas and models in working innovations, so we have taken the time to read the reports and condensed key trends and takeaways, with a particular focus in the area of media taxonomy for creative formats. The second part of this report introduces some of the world’s most innovative companies leading the way in the immersive technology sector.

A large proportion of start-ups featured in this report comes from the United Kingdom, which is a leader in this nascent industry. By the beginning of 2018, there were more than 1,000 immersive technology firms in the UK potentially representing 9% of global market share. A recent report by Innovate UK estimates that around 4,500 people are working in this sector, with most skills deriving from the UK Creative Industries. Immersive media in the UK is a growing sector and poised to cross the notorious chasm (figure 1) on the technology adoption curve.

![The Technology Adoption Lifecycle](image)

Figure 1: Geoffrey’s Moore’s Crossing the Chasms, 1991
Immersive technology challenges

The immersive industry faces some unique challenges which it is meeting by developing new working methods and practices. One challenge, which Digital Catapult points out, is a lack of standardised nomenclature and workflow. Most companies are developing these processes as they go. Companies are experimenting with combining new working methods with traditional video, animation and gaming workflows. To help, Digital Catapult have been working with a range of industry-leading companies, such as Limina Immersive, to look at emerging trends and suggest a way of approaching a common taxonomy for these new forms of content. Other partners include Opposable Group and TechSpark who have looked at the variety of creative tools and workflows at play in this new medium, and Nesta and i2 Media Research who have explored the creation of a toolkit for measuring and gauging audience reactions to immersive content.

At the same time, production budgets tend to be small in comparison to traditional games, film, TV, or animation. Production teams also tend to be small, with around three to five core members, and additional expertise and skills are brought in as necessary. There is also a shortage of people with the necessary skills and experience. These challenges have led to a great deal of cross discipline experimentation and collaboration which is turning immersive content creation into a vibrant and fast-moving industry.

The rise of 'story living'

While there are a wide variety of emerging immersive formats, Digital Catapult’s work with Limina Immersive has revealed that three of the most popular are: ‘immersive maker tools’, which allow users to make things in 3D space; ‘Activity stimulator’, which recreates real world activities in order to entertain or inform; and ‘Fantasy trip’, in which the user is taken on an imaginative, sensation-inducing journey. These formats all allow the user to create their own personal narrative. This has been termed ‘story doing’ or ‘story living’. The most successful formats also tend to combine more than one sort of immersion in their audience, which could include both spatial and mental immersion of the participant.

One developer producing ‘story living’ content is immersive studio CATS are not PEAS. Founded by VR filmmaker Alex Rühl, CATS are not PEAS creates VR and AR frameless stories that put the viewer at the centre of the story. CATS are not PEAS has recently launched SubconsciousVR, which is developing a tool for delivering seamless interactive 360° experiences that are driven by users’ subconscious choices (page 11).
Products like this may one day allow users to direct VR experiences based entirely on what they are thinking – using VR to create VR. SubconsciousVR is an alumna of the Digital Catapult-sponsored Augmentor accelerator program.

Other VR developers come from different backgrounds. Limbik is a theatre company that is collaborating with developers to create immersive experiences with VR (page 12). The latest project is ‘Fatherland’, which was produced in conjunction with the University of Portsmouth. Fatherland is an immersive theatre experience which combines virtual reality and real-time motion capture with audience participation and live audio and video projection. The project received development funding from the Creative XR fund, which was developed by Digital Catapult and Arts Council England to encourage experimentation in immersive content.

![Figure 2: Limbik's Fatherland tells a father and son's story about coming to terms with dementia.](image)

**Immersive experiences**

The Creative XR Fund also provided support to creative tech studio All Seeing Eye, which is developing ‘Immersive Histories’, a new immersive format that would allow audiences to step back in time to experience historical events (page 13). The experiences would combine physical objects and sets with virtual reality, sensory feedback and performance to give an accurate portrayal of what it would have been like to live in a specific time and place in history.
Digital Catapult’s report has used the term ‘Wonder in Education’ for projects like those by All Seeing Eye, because they seek to educate by providing an awe-inspiring experience. This type of experience might see the user as an ‘explorer’ to another time or place. **VR City**, another Creative XR Fund project, is combining the ‘Wonder in Education’ format with story living to produce VR that focuses on transformative emotional experiences (page 14). Their latest project is ‘Municipal Dreams’. It delves into the history of the Aylesbury Estate, in Southwark, which was originally built as a reflection of social housing idealism, but eventually became a symbol of ‘broken Britain’.

Another type of immersive format identified in the research is ‘Perspective Shifter’. This format enables users to enter another person’s body or experience a slice of someone else’s life. Recently, Springwise covered two Prague-based artists who used VR to create a Perspective Shifter performance piece, called **Dust** (page 15). The piece allowed users to experience a dance performance from the perspective of a particle of dust travelling in space around the performers. The work combined volumetric recordings of the dancers with 3D backgrounds.

Another popular VR format, as reported in the report **Immersive Content Formats for Future Audiences**, is ‘Activity Simulator’. This format recreates real-world activities in order to entertain, inform or educate. Japanese company **First Airlines** has used this format to create an immersive experience that allows users to take a trip abroad without leaving home (page 16). ‘Travellers’ experience a simulated take off and flight that replicates a real plane journey. Once at their destination, they experience various activities and meet a local resident. They are also served typical food from the destination country. The trip ends with a flight home and a landing simulation.
Projects like Dust and Immersive Histories seek to create a sense of ‘smallness’, which can amplify the sense of wonder and the gravity of the chosen subject. The projects highlighted here focused on sight and hearing, but other efforts have been made to add the sense of touch to immersive content. Immersive Histories, for example, also includes a tactile component. They use a SubPac – a wearable tactile audio vest to add the sense of touch to their experience.

**Immersion with haptics**

While great strides have been made in creating more realistic visual and audio experiences, the field of haptics (sense of touch) is still in its infancy. In order to give a realistic sense of touch, the haptic device must provide not only the feeling of different textures, but also force feedback – the feeling of pressure or weight.

Augmentor start-up Valkyrie is currently developing a lightweight, full-body wearable haptic suit that would allow users to feel a virtual environment (page 17). Uses for the suit could include education, military, entertainment, retail, medical and remote training applications. For example, inexperienced surgeons could ‘feel’ what it is like to perform a particular operation by connecting to an experienced surgeon while they perform the procedure; consumers could feel whether shoes fit before they buy; and students could feel what it is like to touch a dinosaur.

![Valkyrie haptic device](image)

*Figure 4: Valkyrie is creating a full-body wearable haptic device.*
While Valkyrie’s suit is still in the prototype stage, other companies are forging ahead with simpler haptic devices. Springwise has covered a collaboration by marketing agency Geometry Prague, the National Gallery of Prague, the Leontinka Foundation and VR tech company NeuroDigital, to develop haptic gloves which let vision-impaired museum-goers feel art (page 18). The team first took laser scans of sculptural masterpieces such as Michelangelo’s David. Using these scans, 3D models were created in a virtual space. These were then translated into vibrations, which are transmitted to users via specialised gloves. Actuators embedded in the gloves send vibrations which the wearer’s sensory system translates as touch. Haptic systems like this promise to open up new opportunities and inclusivity for many with sensory deficits.

Data Visualization

While many tend to think of immersive tech in terms of entertainment, it also offers great potential for scientific collaboration and exploration. Lume, which has also gone through the Augmentor program, is one start-up working in this area (page 19). They are developing a multi-user VR platform that will allow scientists to share point cloud data. A point cloud is a set of data points that has been mapped in 3D. Point clouds are used for many purposes, including modelling landslides, volcanoes, and soil erosion, making digital elevation models, medical imaging, architecture, and creating 3D CAD models for manufacturing. Lume’s system would allow users to view their point cloud data in VR, to physically navigate through the data, ‘grab’ individual data points and move them, as well as to change the colour, brightness and size of the points.

Figure 5: Lume has created a VR platform for scientific exploration and collaboration.
The Becoming Social project, funded by the EU Commission, is using immersive VR to map the regions of the brain that are sensitive to social interactions, and how these regions develop as children grow (page 20). The project is aimed at providing a better understanding of autism. In order to study how the brain processes non-verbal cues during social interactions, the researchers needed a way to completely control one side of a conversation. To accomplish this, they built virtual people in a VR space, and had them engage in conversations.

The ability to make the best use out of large amounts of data is not only important to engineers and scientists, it is also vital to many businesses. California-based Virtualitics has created an AI data analytics platform that uses immersive VR to bring information to life (page 21). The platform can render different types of data in three dimensions, to produce a cloud point, and then view the cloud point in immersive VR. The platform also allows users to create a virtual office and then collaborate with other team members around the world in the virtual space.

Growth in AR

Immersive tech is not only taking off in the world of virtual reality. There is also a growing use of immersive tools in augmented reality. The wider availability of AR is helping to drive many new creative and revenue opportunities. One company working in this area is Augmentor alum HoloMe, which creates high definition holograms which can be accessed through smartphones or tablets (page 22). Users first record their visuals with traditional video, and HoloMe then translates this into an AR hologram. This technology has a vast potential for use in retail.
HoloMe recently teamed with young British fashion brand RIXO London, to produce a holographic version of a catwalk show for users to watch at home using their smartphones.

In fact, this type of AR is poised to become a mainstream, everyday experience. Apple has recently introduced ARkit, a developer platform for AR, which is hosted on their new iOS 11 platform. Google’s ARcore brings the same technology to Android users. These platforms will allow AR to be integrated into most apps, making it possible to add an AR layer to almost anything. Research from investment firm Digital Bridge shows that a majority of consumers now expect most retailers to begin offering AR apps.

**Everyday immersive VR and AR**

Many of the companies previewed here are highly specialised, focusing on scientists, engineers, the arts or businesses. But immersive tech is moving quickly to develop practical, everyday applications in almost every area.

For example, VR has been applied by New Zealand’s Department of Transport to help learner drivers. The Drive VR platform can be used at home with the Google Cardboard VR headsets (page 23). It allows users to practice spotting hazards, checking blind spots and mirrors and looking out of windows at the right time. Observation skills are tracked, so learners can keep track of their progress rates.

Atlanta-based start-up Vippo helps people looking to remodel or build a new home (page 24). The company’s platform allow users to preview architectural plans in VR before committing them to construction. Plans are rendered in 3D and consumers can experience immersive simulations and fly-throughs before they build. Engineers can also use Vippo to check for structural integrity and potential build issues.

An interior design app called RoomAR allows users to visualise how home furnishings products would look in their own homes (page 23). The mobile app can show users how different products would look in their homes, then connect them to an online shop offering those products. American start-up Kabab has developed an AR app that allows diners to preview their meals before ordering (page 25). The app can place virtual dishes on the table in front of them, along with prices and nutrition information. It is unclear how many diners will need or want to see a picture of their food before ordering, but the app could prove a valuable tool in driving traffic to restaurants.
An immersive future

It is clear that all types of immersive content are set to take off. As this happens, it will become important to develop a consistent taxonomy and workflow methodology. This will help smooth production and uptake. There are also a wide number of challenges to be met. For example, the large file sizes in VR place higher demands on existing network infrastructure. There is no streaming format for VR as yet that can scale to large numbers of viewers on desktop or mobile. Content needs to be downloaded to a device prior to playback, which many viewers find inconvenient.

There may also be a need for more incubators in this industry, to ensure that a wide variety of formats are produced, and that new skills and tools are encouraged. Entrants such as Netflix, who have deep pockets and an ability to deliver high bandwidth demands, may already have a head start.

Despite the challenges, and emerging nature of immersive content, surveys by Digital Catapult have demonstrated that consumer expectations of the new industry are high. At the same time, consumers are enthusiastic about this new medium, and willing to pay for quality experiences. This will translate into big growth for the immersive content industry. With many industries and sectors experimenting with VR and AR technology, one thing is certain, immersive is here to stay.
Immersion storytelling studio adopts VR, AR and 360-degree videos

Startup incorporates state-of-the-art technology into its films to create a unique experience.

Advances in technology have revolutionised the film and video industry. YouTube, for example, was once home to footage of individuals talking to camera in their bedroom. With ever-evolving technology, footage from drones, GoPros and 360-cameras has become commonplace, although no less impressive. Virtual reality was manipulated as part of a series of short films that helped trigger happy memories for Alzheimer’s patients, signifying the technology’s impact on a far wider scale than just entertainment. Elsewhere, a 360-immersive setting offers a unique experience in the ballet, offering every angle of the show.

Enter Cats Are Not Peas. The UK startup is using 360-cameras, augmented reality and virtual reality within its films to create an entirely unique viewing experience. The immersive storytelling studio was founded by VR filmmaker Alex Rühl. It aims to put viewers at the centre of their stories using frameless formats, increasing the realism for the audience.

Augmentor has chosen the uniquely-named UK startup as part of its 2018 intake. Augmentor is a 10-week programme supporting early stage businesses developing innovative and commercially focused applications of augmented and virtual reality. The programme also gives companies technical and business mentorship, access to state-of-the-art facilitie. It culminates with the opportunity to pitch their ideas confidently at an exclusive investor showcase. It also provides its cohort exclusive masterclasses to accelerate the development of their business and facilitates introductions to universities to lead collaborative research and development with PhD students.

Takeaway

Immersive films provide so much more than simply entertainment. As mentioned, the technique can have a huge impact on the sick, helping individuals understand their illness or take them back to happier times. Charitable organisations that represent lesser-known illnesses could also use the technology to provide the public with an insight into what they are raising awareness for. How could other traditional entertainment-based solutions be revolutionized into a force for good?
Virtual reality has changed the way companies can interact with their target audience. Once the workings of futuristic fiction, VR has integrated into a multitude of industries to expand the consumer experience and offer something a little different. Springwise has written of a variety of ways in which the technology can otherwise function. This includes using an app to help learner drivers and by an airline to streamline the seat selection process. The possibilities for VR manipulation are endless, making it an exciting side of technology for businesses to explore.

VR has even taken to the stage. South African agency Limbik utilised the technology as part of its interactive theatre experience, Fatherland. The experience uses real-time motion capture and VR technology to bring the journey of a son and father to life. The pair come to terms with dementia and disembodiment in a modern world. The art installation was completed in partnership with University of Portsmouth and The National Theatre.

Digital Catapult and Art Council England named Limbik one of their 20 CreativeXR teams to watch at the start of the year. CreativeXR is a new programme enabling the UK’s arts and cultural sector to lead the field in immersive content creation and digital innovation. The agency received an offer of up to 20,000 GBP to expand its immersive projects and gained access to Digital Catapult Immersive Labs in London, Brighton, North East Tees Valley and Belfast. Fatherland was created using HTC Vive trackers, IKinema Orion and Live Action, and Epic’s Unreal Engine. Immersive experiences are becoming a popular way for charities, startups and corporations to connect with an audience that may not otherwise understand its offering.

**Takeaway**

Diseases like dementia can be difficult to explain to those who have not experienced it, whether first- or secondhand. Virtual reality comes into its own in this capacity, offering an emotionally and technologically eye-opening ‘in their shoes’ experience. What other singular experiences might be opened up to wider audiences through immersive technology?
Virtual reality allows people to experience situations they might otherwise never see. Ranging from the unlikely, such as space travel, or the realistic, such as scuba-diving, anything is possible with VR and the right story. Virtual reality has helped blind people experience art for the first time and take art lovers back to the 1910s with a tour of a famous painter’s studio. Technology is helping open people’s minds to things they never thought they could experience.

Creative technology startup All Seeing Eye has taken its own spin on this ability with its Immersive Histories experience. The immersive VR offering allows an audience to physically step into history. Users can witness the famous ‘Dambusters’ mission from on board Guy Gibson’s Lancaster during the Second World War. It is based in an accurate physical set of a Lancaster and audiences experience complete immersion. They even have the ability to reach out and feel the surroundings. Inside the aircraft, discussions take place over the intercom and the nighttime landscape zooms past the audience. Users wear haptic vests integrated into authentic ‘Mae West’ life preservers so they can feel the roar of a Lancaster engine and booms of the German flak. The experience was created with support from Other Set and the RAF Museum.

All Seeing Eye was named one of Digital Catapult and Art Council England’s 20 CreativeXR teams to watch at the start of the year. CreativeXR is a new programme enabling the UK’s arts and cultural sector to lead the field in immersive content creation and digital innovation. The project offered a total of 350,000 GBP to five startups to expand their immersive projects.

**Takeaway**

Using virtual reality to demonstrate a time gone by could be one way the technology makes its way into the classroom. While textbooks and grainy wartime footage work as a learning tool for some students, creating a VR experience that showcases a time in history as if the pupil is actually there is sure to be a stimulant for many in their understanding of the topic. What other areas could be made more engaging through immersive technology?
Immense VR experience gives insight to notorious London area

Production company offers audiences the chance to learn more about one of the most infamous estates in the capital city.

London-based virtual reality and 360-degree video production company VR City has been named one of Digital Catapult and Art Council England’s 20 CreativeXR teams to watch. CreativeXR is a new programme enabling the UK’s arts and cultural sector to lead the field in immersive content creation and digital innovation. VR City won a portion of 350,000 GBP to expand its immersive projects and gained access to Digital Catapult Immersive Labs in London, Brighton, North East Tees Valley and Belfast. The projects all use immersive technologies combined with a range of traditional storytelling techniques such as documentary, poetry and theatre.

VR City’s Municipal Dreams project earned it the coveted accolade. The immersive journey is a virtual reality-enabled exploration of the notorious Aylesbury Estate’s complicated history in South East London. The experience uses stereoscopic 360-degree video, photogrammetry and 3D modelling. The project succeeded with support from Royal Holloway University, Creation Trust and IDFA. VR City’s previous successes include Indefinite, a powerful documentary about the uncertainty and despair of the UK’s indefinite detention system. The documentary became the first UK film on the New York Times VR platform, showcased at Sheffield Doc Fest.

Virtual reality lends itself to the immersive sphere, creating experiences that would otherwise be impossible to recreate. One example covered by Springwise is a new tool that uses VR to help young patients understand and be less afraid of undergoing medical procedures. Who would have thought that such technology could put a child’s mind at rest in such a tense situation? Elsewhere, virtual reality has also been utilised for immersive 3D data analysis. Data renders in three dimensions, and the company’s teleconference spaces allow global employees to attend the meeting and share information.

Takeaway

Placing yourself in a situation that you once couldn’t imagine is virtual reality’s forte. Although tales from history can often be long and complex, the technology provides the youth of today with a chance to immerse themselves in a time gone by. This therefore increases their knowledge of important events of the past and expands their awareness of technology as a learning tool. How could using technology so directly in education shape the future generations of innovators?
Dance performance uses VR to create immersive experience

A new performance piece combines dance and VR to give viewers the perspective of a speck of dust floating through the performance.

With a new performance piece, the world of dance has moved into the world of high tech. Dust is a virtual reality contemporary dance performance in which the audience uses VR headsets to experience the performance from the perspective of a particle travelling in space. Dust was created by Mária Júdová and Andrej Boleslavský, two Prague-based artists who have been working for more than a decade on exploring technology-informed dance practices.

The four-minute-long dance piece was created using a Kinect depth sensor and custom software to capture volumetric recordings of the performers from a variety of angles. At the same time, 3D backgrounds were created using hundreds of photos of building interiors. RealityCapture software and VVVV was used to complete the rendering. The result was a high-resolution 3D virtual model of the performance which allowed observers wearing VR headsets to completely immerse themselves in the performance, experiencing it from the point of view of a speck of dust floating freely through the performance space.

The concept of Dust was inspired by the way that the elements that form life on earth ultimately come from the stars, and from exploring our place in the universe. It also developed from a desire to engage the audience through creative partnerships between performing arts and technology. Says choreographer Boleslavský, “As an improvisational tool, VR can inspire creative movements; as an educational tool, it can record choreography and encourage public engagement, and, for us, it is a tool for endless artistic expression.”

Virtual reality has already been used to allow virtual exploration of an artists’ studio and to allow designers to collaborate in a virtual world. Will the future of theatre and dance include more immersive VR experiences?

Takeaway

Virtual reality has already been used to allow virtual exploration of an artists’ studio and to allow designers to collaborate in a virtual world. In blurring the boundary between audience and performers through immersive technology, VR opens up a whole new world of entertainment and creative arts. Will the future of theatre and dance include more immersive VR experiences?
Japanese airline simulates trips to foreign countries without ever taking off

A new VR experience allows passengers to take an immerse trip abroad in just 110 minutes of simulated flight.

The idea of offering consumers Virtual Reality (VR) experiences related to travel is something we have seen before. An example is the Swedish airport with an immersive Climate Portal, which allows travelers to experience the weather conditions of countries across the world. Another interesting application of VR aims to help customers to choose and book their holiday. Now, the Japanese company First Airlines has gone a step further, simulating the entire experience of a trip abroad.

Passengers can choose to 'travel' business or first-class to one of four destinations: New York, Paris, Rome and Hawaii. Upon boarding the airplane, customers experience the announcement and simulated take off, which is complete with engine sounds. The interior of the plane is fully-equipped and comfortable, featuring first-class seats, flight attendants, and indoor facilities that perfectly replicate a real working plane.

During the immersive VR session, passengers are able to experience various activities specific to the country including meeting a local before the main meal is served. Passengers are offered typical cuisine from the destination country. The experience is complete with restaurant sounds and music to make clients truly feel as though they are abroad. After the meal there is some communication time, perhaps featuring some seasonal events in the visited country. The trip winds off like any typical aircraft experience, with the chance to purchase products on-board and a landing simulation. Passengers must reserve their seat in order to travel, and check-in starts from 15 minutes before flight time in the Ikebukuro International Airport. The price is much lower than a trip abroad, costing just 6600 JPY for a first-class ticket, approximately 62 USD.

**Takeaway**

In Japan the VR experience has been embraced by elderly customers who want to travel but find it difficult because of their physical limitations. Being able to simulate travel without the expense and environmental cost of actually travelling could also be a ground-breaking step forward in terms of eco-travel. How else could simulation be adapted to provide consumers with innovative services and sustainable solutions?
Startup creates full-body virtual reality suit

London-based startup hopes to manipulate the third most reactive sense – touch – as part of its project’s offering.

Valkyrie Industries is building the world’s first universal platform delivering a natural perception of touch for human computer interfaces. The seed-funded project’s goal for virtual reality is to fully simulate the public’s perception of life. Out of all the senses, only vision and sound are on the necessary level according to the company. The third and most important sense, touch, is still underdeveloped.

Valkyrie believes that in order for virtual reality to reach its full potential, technology companies have to consider touch in their offerings. The company’s goal is therefore to create a full-body lightweight wearable haptic device to allow for active manipulation and interaction in virtual environments. Valkyrie gained access to Augmentor, a 10-week programme supporting early stage businesses developing innovative and commercially focused applications of augmented and virtual reality. The programme gives companies technical and business mentorship and access to state-of-the-art facilities. It concludes thereafter with the opportunity to pitch their ideas at an exclusive investor showcase.

Other VR technologies have the opportunity to boost senses much like Valkyrie Industries’ project. A haptic VR glove has transformed the lives of blind people by offering them the opportunity to experience art. Applications such as this exemplify how VR is so much more than a gaming tool. In a different industry, augmented reality is being used for the fight against plastic pollution as a tool to advise customers on product in a zero-packaging store. These varied examples demonstrate the potential of state-of-the-art technology in multiple capacities.

**Takeaway**

Immersive experiences are no longer confined to the 4D screening of Hollywood films. The application of either VR, AR or 360-cameras is becoming increasingly common in the creative sector. The end results are therefore becoming the most believable yet on the market. What other forms of technology might improve the creative and entertainment industries further?
Haptic VR gloves allow the blind to experience art

A new campaign makes museum art more accessible to the visually impaired using haptic VR gloves to touch sculptures.

A campaign created by The National Gallery of Prague lets visitors with visual impairments experience sculpture art. The ‘Touching Masterpieces’ campaign uses haptic virtual reality gloves to perceive art through the sense of touch. This new design offers digital accessibility to art for those who have previously not been able to experience it. Iconic sculptures such as Michelangelo’s David and the head of Nerfertiti can now be experienced through touch.

The gloves are a collaborative design by Geometry Prague, the Leontinka Foundation and NeuroDigital. The design stimulates tactile responses using multi-frequency technology. Vibrotactile actuators embedded in the gloves send vibrations which activate the pressure receptors in the wearer’s somatic sensory system. To create the experience, laser scans of sculptural masterpieces were taken. Using these scans, 3D models were created in a virtual space. The vibrations sent to the wearer vary depending on the sculpture’s shape and texture.

Launched on March 23rd 2018, the ‘Touching Masterpiece’ campaign is expanding the accessibility of art and promoting inclusivity. As museums all over the world do not permit visitors to touch the art on display, this new innovation offers something previously unattainable to the blind. Other innovations that aid the visually impaired include a vibrating cap that alerts swimmers when to change direction. Another example is a camera that creates 3D photos so that images can be seen through touch.

Takeaway

Simulating physical sensations is a growing trend in VR tech. Increasing the realism of VR will open new doors for the application of immersive technologies in areas such as education and rehabilitation. It could also work in reverse to help larger groups understand the experiences of minorities. What other industries could implement VR haptics to welcome excluded or marginalised groups?
Virtual reality used to analyse 3D data

The technology helps users navigate data by grabbing and interacting with it.

Augmentor has chosen virtual reality technology startup Lume as part of its 2018 intake. Augmentor is a 10-week programme supporting early stage businesses developing innovative and commercially focused applications of augmented and virtual reality. The programme gives companies technical and business mentorship and access to state-of-the-art facilities. This culminates with the opportunity to pitch their ideas confidently at an exclusive investor showcase.

Lume has created VR platform Project Lume for scientific exploration and collaboration. Working with The Lee Lab at Cambridge University, the company is developing the multi-user VR software for scientists to better explore, manipulate and share their 3D point cloud data. When operational, users will be able to drag and drop any 3D data into VR. They can then view the datasets from a fresh perspective using the Vive controllers. The current prototype also offers a measuring tool, data selection and export and recording tools. It additionally has analytics and bug report, control over aesthetics such as brightness and point size, and the ability to load up to two million points from .csv format.

Virtual reality offers the opportunity to view age-old things in a different way. The technology is opening doors to helping to educate, inform and expand a person’s experiences. Its capabilities are a far cry from its native video game roots. From an educational perspective, a VR app has been built to assist learner drivers with boosting their confidence and road awareness. This style of application could prove priceless in environments where young people struggle to consume information required for exams via books, for example. Elsewhere, virtual reality headset is also helping people battle motion sickness.

**Takeaway**

Innovations such as Project Lume could prove invaluable in office spaces where time is short and precision is key. The technology could replace the age-old Powerpoint presentations and even a spreadsheet, which are dated and less engaging in their approach. How could virtual reality play an important role in updating your company’s established processes?
Virtual reality may help those with autism

UK researchers are using VR and brain scans to identify parts of the brain associated with social cues.

According to the U.S. Centers for Disease Control and Prevention, as many as 1 in 68 children have been identified with autism spectrum disorder (ASD). Since people with autism struggle to read social cues, such as facial expressions, being able to understand the neurological basis for this may eventually lead to new diagnosis and treatment for the condition. Now, a project funded by the EU Commission, called Becoming Social, is working to map the regions of the brain that are sensitive to social interactions, and how these regions develop as children grow.

The brain’s network is responsible for our social intuition. Exactly when the understanding of social skills develop, or even where in the brain they lie is still unknown. It is also not yet clear whether these skills are learned, or if they are present from birth. In order to try and answer some of these questions, Dr Kami Koldewyn, a psychologist at Bangor University, is using functional MRI brain scans to try and identify which neural networks are active when volunteers observe people interacting. However, studying the way the brain processes non-verbal cues during social interactions can be a challenge because researchers need to completely control one side of a conversation to ensure that the test is accurate. To accomplish this, the team turned to researchers at University College London, who are using VR to create realistic social interactions.

Understanding the link between brain development and social ability could open the door to helping those with autism to develop real-world social skills through training exercises. In addition, this research may have commercial applications, by creating AI which can interact more naturally with humans.

Takeaway

By combining VR and brain scans, researchers are able to bring a new level of scientific rigour to social neuroscience, and allow theories that were previously hard to test to be subjected to controlled experiments. It also avoids the need for living subjects in early experiments. What other ways might exist for using VR and AI to make neuroscience experiments more ethical?
Finding ways to make the best use out of large amounts of data is a task faced by most workplaces everyday. In Paris, a set of hospitals are working to reduce hospital waiting times by using machine learning to predict admissions rates. This allows staff across the city to prepare resources in advance in the locations needing them most. In academia, dedicated research spaces collect and analyze global results, enabling scientists to more quickly test ideas, make unforeseen connections, and possibly most importantly, avoid wasting time by duplicating efforts.

For individual organisations, getting teams together to go over figures can often be problematic. Virtualitics aims to change that through its virtual reality data analysis program. Rather than reading numbers on a page, the Virtualitics system brings the information to life. Data is rendered in three dimensions, and the company’s teleconference spaces allow employees anywhere in the world to attend the meeting and share the same information.

As humans acquire most information visually, the Virtualitics system hopes to reveal insights that could easily be missed when looking at flat data. The team behind the program says that the intersection of data is often where the most interesting and important information lies, yet is especially difficult to render in only two dimensions. The fully customisable system allows for appropriate levels of detail to be shown to different teams, and crucially, the program does not rely on expensive headsets. The experience can be accessed via desktop and mobile, making it easy and inexpensive to gain the insight remotely. The company is focusing development on increasing the depth of the AI analysis, and thus insights, the system can provide.

**Takeaway**

With the growth in remote work, startups all over the world are launching services and tools that support automation and cross-office collaboration. Virtual reality could be applied to areas requiring extensive administrative tasks that often take away from the personal side of the job, such as social care or teaching. How else might immersive technology foster new forms of communication?
Augmented reality software developer HoloMe Technologies has partnered with H&M group brand Monki to explore a unique creation of high definition human holograms in augmented reality. The app will be accessible through a smartphone or tablet with minimal data usage, turnaround time and processing power. Images of nine Monki outfits will be enhanced and made available in 3D. This modern take on the shopping experience boosts customer satisfaction by allowing them to view products as though in the room. It could act also as a tool to assure their purchases are the right ones for them. Pending trials, AR’s application in this industry could change the way consumers shop in the era of online shopping.

HoloMe is one of the first UK startups to offer a tailored human-sized hologram service and gained access to Augmentor’s 2018 intake. Augmentor is a 10-week programme supporting early stage businesses developing innovative and commercially focused applications of augmented and virtual reality. The programme gives companies technical and business mentorship and access to state-of-the-art facilities. It concludes thereafter with the opportunity to pitch their ideas at an exclusive investor showcase.

Augmented reality hit the mainstream market in the form of the Pokemon Go app in 2016. Since then, however, it has weaved its way into almost every industry. In Japan for example, a record-shaped cake in a confectionery store uses an AR app that allows the consumer to choose a customizable song or message. Elsewhere, AR glasses weighing just 120g went on sale in July that are even embedded with voice and facial recognition technology.

**Takeaway**

Augmented reality’s application in a fashion and retail environment has the potential to revolutionise the industry. Long gone are the days where consumers are happy to wander around shops on the weekend. The demand for faster fashion has never been higher, with shoppers perusing online and wanting instant deliveries. The application of AR technology could increase customer satisfaction with purchases and lower returns rates. What other industries might benefit from an alternative, tailored experience?
Virtual reality app aids learner drivers

National education scheme embraces virtual reality to help learner drivers hit the road with confidence.

Virtual Reality (VR) has weaved itself into every industry, proving itself to be useful in different capacities. Springwise has covered the technology in length, analysing the multiple ways in which it is changing businesses and sometimes even people’s lives. One VR tool used in hospitals shows paediatric patients a 3D tour of their body, helping alleviate fear in a stressful situation. Elsewhere, the technology has proved useful in business settings by connecting employees via a teleconference to analyse data. Who knows how VR will expand next, but it is inevitable the system will reach the forefront of many business strategies.

VR has been applied in a practical sense by New Zealand’s Transport Agency (NZTA) to help learner drivers. The Drive VR app was developed to help people learning to drive to gain experience. It can also be used to boost confidence in everyday driving skills such as observation tasks. The app is free to download on the App Store or Google Play. It can be used with the Google Cardboard VR headsets for a more immersive experience. Thousands of the headsets have been given away on the app’s website. It is hoped the platform will help learners gain experience and knowledge for their theory test through to the practical exam.

App users will get the chance to practice spotting hazards, checking blind spots and mirrors and looking out of windows at the right time. Observation skills are tracked, so learners can keep track of their progress rates. Drive VR was created by NZTA and ACC in collaboration with external partners Strategy Creative, Mixt Studio, and Flying Saucer. The platform has had more than 30,000 people sign up and almost half a million total users. These leaners have completed 52,000 online road code chapter tests to date.

Takeaway
Simulation-based training can reduce occurrences of error when practising skills in the real environment. This is particularly important for high risk professions such as aviation, where damage expenses and risk to human life can be minimised. How could you incorporate VR into your business operation to reduce error rates and improve employee performance?
Architectural visualization brings building projects to life

A startup provides comprehensive architectural visualization through VR and 3D printed models to help get home owners and developers involved in the design process.

In this evermore innovative and modern world, architecture has embraced progress. We have seen a 690 square foot self-assembling building which unfurls in minutes, no effort required. Additionally, we have also seen a growing number of trending innovations centered around virtual reality. The Japanese airline’s flight simulation for example, shows VR’s incredible potential. Without even taking off, passengers experience an immersive trip abroad. Now, Vippo has combined these two trending elements to bring VR into the architectural field.

Vippo is a startup based in Atlanta. It is currently in soft launch across the city, helping customers come to understand what the company can offer them. Vippo aims to save customers time and money using technology. By giving home builders a chance to preview their architectural plans before committing them to construction, it allows customer to identify any imperfections, or, indeed, glaring structural issues.

Vippo offers three services to consumers. The first of these is the design phase. Vippo creates data driven simulations which helps home owners get involved in the design process. Furthermore, it facilitates team collaboration. The virtual reality stage comes next. This gives customers the chance to visualize their project in 3D. Achieved through VR technology, consumers can experience immersive simulations, renderings or flythroughs. The third phase is physical. Vippo produces full color 3D printed models of the consumer’s project, in just hours.

Takeaway

Vippo is set apart from other similar innovations by its capacity to take the engineering plans into account, as well as the architectural ones. Could this approach be the future of design? How could VR technology be integrated with real-time feedback technology to allow clients to fully interact with a proposed model?
A new interior design app, called RoomAR, uses Augmented Reality (AR) and Artificial Intelligence (AI) to enhance the home furnishing experience. Targeted at retailers and manufacturers, RoomAR allows users to visualise how virtual products will appear in the real world.

Using Deep Learning, Machine Learning algorithms and computer vision, RoomAR Core analyses the user’s sense of style. Taking style and living conditions into consideration, the mobile app can personalise the product recommendations it offers to each user. After recommending products, the app connects to an online shop through RoomAR Shop, enabling users to purchase products. A personal and easy-to-use service, RoomAR offers an innovative way to furnish homes and enables businesses to increase sales. Additionally, RoomAR is useable as a sales tool, to help advertise products at trade fairs and in showrooms.

Data-based business insights are also available to retailers and manufacturers through RoomAR Analytics. Data providing insights into trends, customer activity and target customers, is collected using machine learning techniques.

RoomAR is changing the way consumers shop for furnishing and the way businesses sell furnishing. By offering AR visualisations of products, consumers and businesses can see exactly how a product will look in an environment. RoomAR makes this possible by merging online and offline retail experiences together.

**Takeaway**

A major shift in the retail space is being driven by customers expectations. Retailers are increasingly looking for solutions that can offer an omni-channel experience. Simulations such as this one help create an ever-larger crossover between physical and online retail. How might technology such as this change the current appearance of our high streets and shopping districts?
We are seeing augmented reality being developed for more and more practical purposes. These include interior design and training. Now, AR is being used to give diners a preview of their meals. American start-up Kabaq has developed AR software that can show diners their meal before they order. The system uses Snapchat World Lens. Instead of having to download a new app to view the menu, diners scan a Snapcode using the popular World Lens app. The app will then place a virtual dish on the table.

The AR food is created using photogrammetry. This is a process in which photos of an object are taken from different angles and used to create a 3D model. The software also allows restaurants to add prices and nutrition information to the AR model. Kabaq co-founders Alper Guler and Caner Soyer previously created tools for interior design. The idea to start Kabaq came after the pair tried to explain the dishes at a Turkish restaurant to a friend. They realised that it would be a lot easier to explain the food with visuals. According to Guler, Facebook, Snapchat, and Instagram have made the visual element of food more important to customers. He points out that AR will allow restaurants to, “create even more visuals to drive more traffic to the restaurant itself”.

One of the first restaurants to partner with Kabaq is New York-based Bareburger. Along with Snapchat, the AR food models can be integrated into other social apps, like the Facebook Camera. Kabaq’s software will also allow restaurants to build AR food items into their own apps. This will allow restaurants to place an AR menu alongside functions such as placing an order and finding the nearest location.

**Takeaway**

The food industry is changing rapidly and technology is enabling more transparency in the supply chain. In the future, AR could be combined with blockchain technology to enable secure traceability of certifications and offer a visual representation of an item’s farm-to-store journey. How might increased consumer access to such information affect future buying habits?
This report has been inspired by recent research in the field of immersive technologies, which was commissioned by Digital Catapult, and funded by Innovate UK.

Digital Catapult is the UK’s leading advanced digital technology innovation Centre, driving early adoption of technologies to make UK businesses more competitive and productive to grow the country’s economy. The reports listed below highlights key trends in the UK’s immersive ecosystem.

**Immersive Content Formats for Future Audiences**  
(Digital Catapult & Limina Immersive)

**Evaluating Immersive User Experience and Audience Impact**  
(Digital Catapult & Nesta, with i2 Media Research)

**Creative Tools and Workflows for Immersive Content Creation**  
(Digital Catapult & Opposable Group, with TechSpark)

**Icons credit:** Piers Elliott for Digital Catapult and Limina Immersive

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