

Perspectives*

CIVICA

Volume 01

Extending our reality

Can immersive
technologies
support the future
of public services?

Inspired by CIVICANorthStar*





Our world is continually changing and evolving, and remains as fast-paced as ever. The global pandemic has altered our lives and highlighted the essential role technology plays in keeping us working and connected.

We outlined [seven key trends for 2021](#) which we believe will keep pushing the boundaries of public services and inspiring us to be bolder. We understand that the need to stay ahead and remain innovative presents a challenge for us all. So to help, we're launching our new series – Perspectives*.

Designed to inform and inspire, Perspectives* explores how emerging technologies can address these trends, and help us build more innovative public services for today, and tomorrow.

Perspectives* is not just a standard content series. It expands on the latest thinking from our innovation lab, [Civica NorthStar](#), and with opinions from innovators and leaders around the world, showcases the potential of relevant technologies for public services.

We kick things off by examining the impact and opportunities for immersive technologies. As always, we welcome your perspective, so please do [continue the conversation](#) with us. Together, we can deliver the public services of the future.

Liz O'Driscoll

Head of Innovation, Civica

Perspectives* will explore four themes throughout 2021:

1. Immersive technologies
2. Chatbots and conversational AI
3. Advanced data analytics and machine learning
4. Augmented collective intelligence

CIVICANorthStar*

Executive summary

Immersive technology is a generic term covering technologies used to extend our reality. From Augmented Reality (AR) to the fully immersive Virtual Reality (VR), immersive technologies vary in terms of complexity, immersion and usually cost.

\$571bn

is the expected size the AR & VR market will reach by 2025 ([Forbes](#))

Immersive technologies are increasingly entering our daily lives, and we believe they will make a difference to the delivery of services. We explore how they can bring further positive impact to public services and our communities.

What we observe is that far from being science fiction, they are already being used to make an impact. The COVID-19 pandemic, and continued social distancing, has increased the need for solutions to engage communities, and provide essential 'in field' services and repairs remotely.

The health sector is leading the way with widespread deployment of VR for training and assessment. Uses of AR range from mature examples such as military situational awareness, to emerging ones which help local authorities enhance the tourist experience.

While the main drivers behind the success of these technologies are likely to be cost, scalability and adoption, it is useful to remember that AR content can be easily consumed on a smartphone – a device which most citizens own.

This provides huge possibilities to build immersive services that can be accessed by anyone and at any time.

Immersive technologies are here already, and we believe that they will become more important over the next 24 months. Virtual and mixed realities will remain strong for training and assessment, and this will be the niche in the short-term. For other use cases, it will remain as 'one to watch'.

It will be smartphone-enabled AR, data visualisation and remote guidance that will further develop across all sectors, and should be the main focus area for public services.

// The response to COVID-19 let the mixed reality genie out of the bottle and it's not going back in. The realities of immersive learning is driving a radical rethink of working practices. It is taking what were considered to be **technologies of the future and making them technologies of the now.**"

Angela Eager

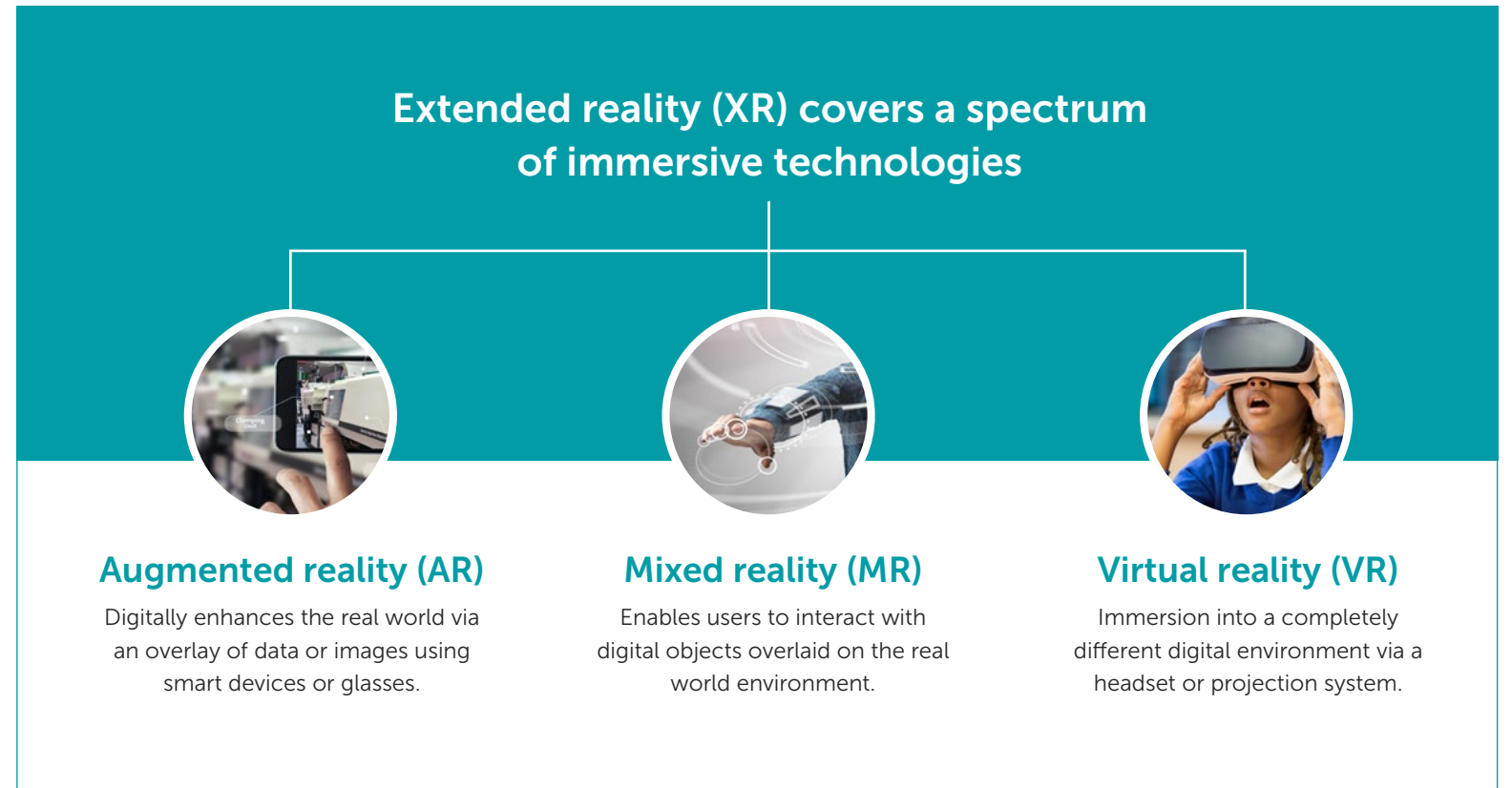
Research Director Emerging Tech,
TechMarketView

The term immersive technology can stimulate thoughts of 'Iron Man', flight simulators or even Pokemon Go.

By taking that initial leap, the gaming and movie industries have become almost synonymous with immersive technologies.

Beyond Hollywood, this tech has been a growing force across the public sector - establishing new ways to connect and deliver services.

But before we move on, what do we mean when we say immersive technologies?



How is it helping us?

Immersive technologies provide a unique opportunity to tap into our emotions in a way current methods cannot. They deliver richer experiences and better mentoring and support.

With this in mind, we believe there are four main areas where it is making the biggest impact.



When you see a QR code, click the icon to learn more. Or why not immerse yourself by scanning with your smart device camera.



Data Visualisation

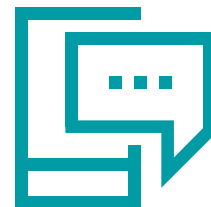
Augmented and virtual reality is helping employees and citizens visualise huge volumes of data to improve decision-making.

In defence for example, full 3D visualisations (sometimes called a 'digital twin') of ships are helping engineers check for problems before manufacturing begins.



Moving a city with AR power

Microsoft



Remote Assistance

Immersive technologies can support live knowledge exchange providing faster help and care to those who need it.

AR combined with smart devices, can help experts provide remote guidance, and even virtually reach out and support colleagues or customers.



Remote visual support

Vodafone



Enhanced Experiences

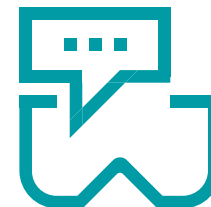
Immersive experiences are already widely available from VR headsets for gaming, to AR driven photo-enhancing apps.

A virtual '[try before you buy](#)' allows customers to see how products look, while museums and artists use AR to [enrich a visitor's experience](#).



Bringing skeletons to life

Smithsonian Institute



Training and Assessment

The tech brings content to life in a low-cost environment. It is already recreating physical conditions to train people across multiple areas.

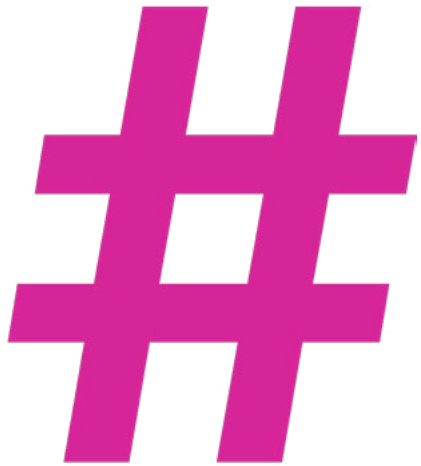
Riot training for police. Tackling virtual blazes for firefighters. Or [practising complex surgeries](#) for medical teams. All without putting users or patients at risk.



Emergency response training

Shell

Now is the time



2020 has been a defining period for public services and our communities. It's unmistakably altered our lives, and highlighted the role technology is playing in keeping us connected.

But it has also intensified citizen expectations, and galvanised their demand for more digital services. Citizens are more aware of what can be done online, more comfortable in doing so, and increasingly more critical of those not meeting their expectations.

Technical advances in hardware and content creation, in combination with the radical changes to daily life, will continue to accelerate the quality and adoption of immersive experiences.

VR is fast being established as a technology that offers significant benefits for training and media. While AR, delivered via mobile apps or smart glasses, offers new ways to reconnect co-workers and customers, and to enhance the experience for citizens.

We believe there are a number of opportunities for immersive technologies in public services. To help, we've examined five key sectors to explore its impact and inspire further conversations.

{ Health and Care

“Immersive health technologies are revolutionising the delivery of frontline healthcare, therapeutic techniques, and research.”

European Medical Journal

Source: [EMJ Reviews](#)

What's driving the opportunity?

// We are aware of the potential for **AR/VR to play a part in new care models**, specifically in the area of patient safety, training the future medical workforce, working with mental health and with patients who are frail.”

Dave Tarbet

Director of Business Development and Innovation,
Royal Devon and Exeter NHS Trust



85%

of GP consultations took place remotely in 2020,
either online or by phone ([Rt Hon Steve Barclay MP](#))





80%

of citizens would be comfortable if AI was used to help a
doctor deliver a better service ([Public Attitudes to Science](#))

Making a positive impact

We've hand-picked a few examples to show where immersive technologies are making an impact. But what else is possible? Continue the conversation and [share your perspective](#).

 Data Visualisation	 Remote Assistance	 Enhanced Experiences	 Training and Assessment
<p>Saving lives ●</p> <p>AR is helping nurses find patients' veins, avoiding 40%+ of intravenous insertions that miss the mark on the first try. Also, AR apps are guiding users to the location of the nearest Automatic External Defibrillator.</p> <p>Integrating AR and wearables ●</p> <p>As AR moves into wearable devices, there is a huge opportunity to enable citizens to use the power of smart devices and contribute to their health analytics.</p>	<p>Improving surgical outcomes ●</p> <p>AR is enabling computer-generated features to provide live guidance during surgery. Smart software recognises anatomy parts, as well as enabling experienced peers to join remotely.</p> <p>The patient's perspective ●</p> <p>Patients can struggle to describe symptoms accurately. AR could help doctors gain an enhanced understanding, as well as enabling a simulated experience of conditions to help classify patient symptoms.</p>	<p>Psychological support ●</p> <p>VR environments are creating powerful simulations of the scenarios in which psychological difficulties occur, such as fear of heights or social interactions. During COVID-19, VR has helped combat isolation.</p> <p>Pain management ●</p> <p>VR is fully immersive, replacing physical sensations with computer-generated images and noise. This means a patient can be immersed in a virtual world that can help manage pain, and also escape reality.</p>	<p>Medical training ●</p> <p>VR and MR are widely used for medical training. The NHS deployed virtual tech to deliver remote COVID-19 educational programmes to employees at scale through VR headsets and smart devices.</p> <p>Improving rehabilitation ●</p> <p>MR has been piloted to allow healthcare providers to rapidly assess the care needs of people and provide tailored support. With NHS pilots funded for stroke rehabilitation.</p>

● Established: already making an impact ● Emerging: starting to make an impact

// There is an opportunity now to exploit immersive technologies for use in social care. The technology has been around for several years, it seems to be proven that it works and is valuable. Now we just need to put the business cases together to say that **we should be doing this as standard.**"

Llewelyn Morgan

Head of Innovation,
Oxfordshire Council

Using AR to enhance liver cancer therapy

Cleveland Clinic, USA



{ Local Government

“VR can demonstrably support the quartet of motivations that drive most organisations: increasing revenue; decreasing costs; reducing complexity; and saving time.”

Jeremy Dalton

Head of XR, PWC

Source: [Public Technology](#)

What's driving the opportunity?

// Adoption of immersive technologies will be a **crucial tool for innovation**, driving tangible benefits, mitigating high-risk and exploring the future of an augmented workforce."

techUK







of millennials are willing to use AR and VR in their professional lives ([Dell](#))



active VR users across the world ([Statista](#))

Making a positive impact

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<p>Urban planning ●</p> <p>City authorities are piloting AR and MR to help planners, officials and citizens to engage in community planning. Immersive 3D data visualisations can aid understanding of what a new development might look like, or the impact it would have on traffic patterns.</p> <p>Street maintenance ●</p> <p>AR can be used to provide council workers with information about asset status, enabling them to visualise information live in the field. Using a smartphone with location data, information from asset management systems could be overlaid onto the physical view. This could include asset status, outstanding repair requests and citizen complaints.</p>	<p>Supporting tourism and culture ●</p> <p>Many cities offer AR smartphone apps to highlight points of interest. Immersive technologies are supporting increased engagement across urban spaces and enhancing visitor experience in museums.</p> <p>Realising the smart city ●</p> <p>AR can be used to access smart city services, where citizens can interact with local authorities, access public services and learn more.</p>	<p>Looking for more?</p> <p>With synergies in health and care, education and housing, check out our other sector spotlights for more inspiration.</p> <p>Or if you have an example to share, please let us know.</p>	<p>Understanding perspectives ●</p> <p>There have been some pilots to test the use of VR as an intervention tool across adoption and fostering services, as well as supporting interactions between social workers and young people during COVID-19.</p> <p>VR is also being considered to help carers understand the perspective of patients and provide safe opportunities for vulnerable adults to explore situations like voting for the first time or using public transport.</p>

● Established: already making an impact ● Emerging: starting to make an impact

// There is definitely a case for the use of AR and VR in the planning process and development of local plans. Both to engage local communities and also to **allow practitioners to fully immerse themselves** in the transport schemes they build and experience the impact.”

Daniel Clarke

Smart City Programme Manager,
Cambridgeshire County Council

Allocating housing for refugees

City of Hamburg, Germany



{ Education

“Although AR is a relatively new technology in terms of mass adoption, it has the potential to engage and motivate students of all ages, especially in learning abstract or theoretical knowledge, or allowing for experiences that might be unsafe or infeasible in real life.”

Department of Education, Australia

Source: [Australian Government](#)

What's driving the opportunity?

// Augmented reality is poised to have a **significant impact on library workflows** and the way that libraries share information with their patrons."

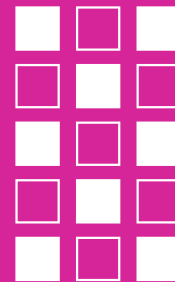
American Libraries Association

Source: [ACRL](#)



96%

of universities in the UK are now using augmented or virtual reality ([UK Authority](#))







70%

of children between the ages of 8 and 15 are interested in the use of virtual reality ([Common Sense](#))

Making a positive impact

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 Data Visualisation	 Remote Assistance	 Enhanced Experiences	 Training and Assessment
<p>Library management ●</p> <p>AR apps are being considered to help automate workflows in libraries. For example, using a mobile device camera to scan and tag library books.</p> <p>There is significant potential for libraries to adopt immersive technologies, specifically AR, to enhance browsing experience or improve management of stock. Libraries will also need to be prepared to support AR if and when it becomes more prevalent in textbooks and other print materials.</p>	<p>Looking for more?</p> <p>With synergies in local government, check out our other sector spotlights for more inspiration.</p> <p>Or if you have an example to share, please let us know.</p>	<p>Interactive learning ●</p> <p>VR content is creating opportunities for students to experience environments that may not be possible in real life (e.g. underwater, in space).</p> <p>During 2020, many schools switched to online learning, to engage learners and retain peer connections. VR headsets are expensive, so the biggest opportunity is to deploy AR immersive content that students can access using their own smartphones.</p>	<p>Low-risk vocational training ●</p> <p>The use of immersive technologies, particularly VR, is well documented in training for industries such as oil and gas, fire, aviation. It's main benefit is to allow repeatable learning without high risk or cost associated with training in the real-world.</p>

● Established: already making an impact ● Emerging: starting to make an impact

// When we use immersive technologies effectively, pupils emerge from these atmospheric, inspiring experiences ready to write, paint, create, and talk about what they have just lived. **They are ready to learn."**

Phil Birchinall

Senior Director of Immersive Content,
Discovery Education

Source: [Education Technology](#)

Immersing the learning experience

Preston College, UK



{ Housing

“With increasing recognition of the issues of social isolation and loneliness, immersive technologies provide a potential way to stay connected, and engage with people who need support to live independently, safely and at home.”

Melanie Rees CIHCM FCIH

Head of Policy and External Affairs,
Chartered Institute of Housing (CIH)

What's driving the opportunity?

“ The ability to deliver virtual technical support directly to the customer or to operatives on site will **drive real savings and let us help remote residents** much more effectively.”

Duncan Mackay

Managing Director of R3 Repairs,
East Lothian Housing Association

Source: [Housing Technology](#)







of landlords claim that meeting customer needs is their biggest driver to use modern technology ([CIH](#))



Internet of Things (IoT) and smart home devices projected by 2025 - a fivefold increase in ten years ([Statista](#))

Making a positive impact

We've hand-picked a few examples to show where immersive technologies are making an impact. But what else is possible? Continue the conversation and [share your perspective](#).

 Data Visualisation	 Remote Assistance	 Enhanced Experiences	 Training and Assessment
<p>Enhanced information access ●</p> <p>AR can be used to provide managers with information about tenants while on location.</p> <p>Using a smartphone with location data, information from housing management systems could be overlaid onto the physical view. This could include outstanding maintenance requests or rent status of each property.</p>	<p>Tenant assistance ●</p> <p>Housing associations have embraced AR technologies to provide remote guidance for someone untrained to conduct an inspection or repair.</p> <p>Contactless monitoring ●</p> <p>Creating a digital twin of a building offers benefits for both tenants and managers. Taking input from on-site sensor technology, it could be possible to gain real-time insight on property status entirely remotely. Tenants would be able to control any feature of the building linked to Internet of Things (IoT) sensor network using AR-apps to be pointed at any connected device.</p>	<p>Interactive visits ●</p> <p>Many housing associations are offering virtual tours integrated with choice based lettings platforms. Using a smartphone camera, it's possible to capture 360° video of the inside of a property and enable a virtual viewing.</p> <p>This form of immersive technology is more cost effective than building a full virtual reality model and allows prospective tenants to view properties in a way that is both convenient and socially distanced.</p>	<p>Looking for more?</p> <p>With synergies in local government, check out our other sector spotlights for more inspiration.</p> <p>Or if you have an example to share, please let us know.</p>

● Established: already making an impact ● Emerging: starting to make an impact

// The technology to develop these AR systems is already available. I believe that all that is needed to turn these apps into reality is for **housing suppliers to wake up to the possibilities** and to include these features in their future development plans.”

Chris Deery

Head of ICT,
Solihull Community Housing

Source: [Housing Technology](#)

Using AR to help tenants with routine repairs during COVID-19

Kingdom Housing
Association, UK



{ Government and Justice

"Immersive technologies will deliver economic growth and transform the way we communicate, work and play."

Innovate UK

Source: [The immersive economy in the UK](#)

What's driving the opportunity?

// Using AR or VR **to visualise data can have an enormous impact** on professions such as engineering or city maintenance. Being able to pull up information in real-time will save governments and their contractors a lot of time."

Public Spend Forum

Source: [Public Sector Forum](#)

£62  bn





will be added to the UK economy from VR and AR by 2030 ([PWC](#))

 59%

of Australians want to use VR to shop as they believe it will reduce the risk of infection during COVID-19 ([GetApp](#))

Making a positive impact

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 Data Visualisation	 Remote Assistance	 Enhanced Experiences	 Training and Assessment
<p>Enhanced awareness ●</p> <p>AR is already providing situational awareness for military personnel (e.g. head up displays in aircraft), helping make rapid decisions based on data from multiple sources.</p> <p>Combating crime ●</p> <p>VR is helping forensic teams and jurors achieve better informed conclusions, while AR is helping police forces combat crime.</p> <p>Asset management ●</p> <p>AR can enable the management of current and future infrastructure (highways, rail) by providing digital overlay on top of the real world environment.</p>	<p>Collaborative command ●</p> <p>AR is likely to enable a collaborative virtual environment to support communication between different emergency services even if they are not yet at the scene.</p> <p>Enhancing emergency care ●</p> <p>AR offers opportunities for paramedics to enhance capabilities, improving both emergency assistance and the continuity of care.</p> <p>Wearables, such as smart glasses, can facilitate remote expert guidance to extend their medical knowledge in-field and provide life-saving care for patients.</p>	<p>Public information services ●</p> <p>AR can be used to help citizens engage with local or national services in a highly interactive way. AR-enabled apps can be built to display location-based data such as planning information, crime data or public safety messages.</p> <p>The technology may also enable voters to access information on past performance of candidates and their campaign proposals.</p>	<p>Interactive training ●</p> <p>The use of VR simulation for training is well documented for the armed forces, ensuring training can be delivered without exposure to risk.</p> <p>Highways England is using VR to enable operators to better understand the impact of their actions on the road network.</p> <p>Police and fire services are also beginning to trial these technologies to provide enhanced realism and greater repeatability for training.</p>

● Established: already making an impact ● Emerging: starting to make an impact

// In an increasingly technological world and amidst exponential public concern over bias hindering the fair administration of justice, **VR poses a real, tangible solution in placing judges and juries** in the position of the defendant. Allowing them to truly 'walk a mile' in another's shoes may bring the Australian legal system one step closer to true impartiality in law."

Sydney University

Source: [Sydney University Law Society](#)

Immersing jurors in a crime scene with VR

Institute of Forensic Medicine, Switzerland



Ideas into action

Our perspective is that immersive technologies open many exciting possibilities for public services and the communities they serve. Some sectors are leading the way, but the potential exists for all to use these technologies to better communicate, understand and connect our world.

We see the biggest opportunity in the creation of AR content that citizens can consume on their smartphone. We believe this will become increasingly relevant as more citizens continue to experience immersive content in their daily lives.

While there are some strong use cases, VR has not reached wide-spread maturity in public services. Most deployments are in areas of specialism within Health and Education, providing rehabilitation or psychological support experiences or delivering training. There have been several pilots in other segments but the investment case for expensive hardware and content development has proved difficult.



When will we see the benefits?

From our findings, we have estimated the indicative time to realise the positive impact in each sector.

We believe that some areas are 'ready to go', addressing needs created by the pandemic. Others may take more time to mature and we advise to 'monitor closely', and where possible engage in the design.

- Health and Care
- Local Government
- Education
- Housing
- Government and Justice



Training and Assessment



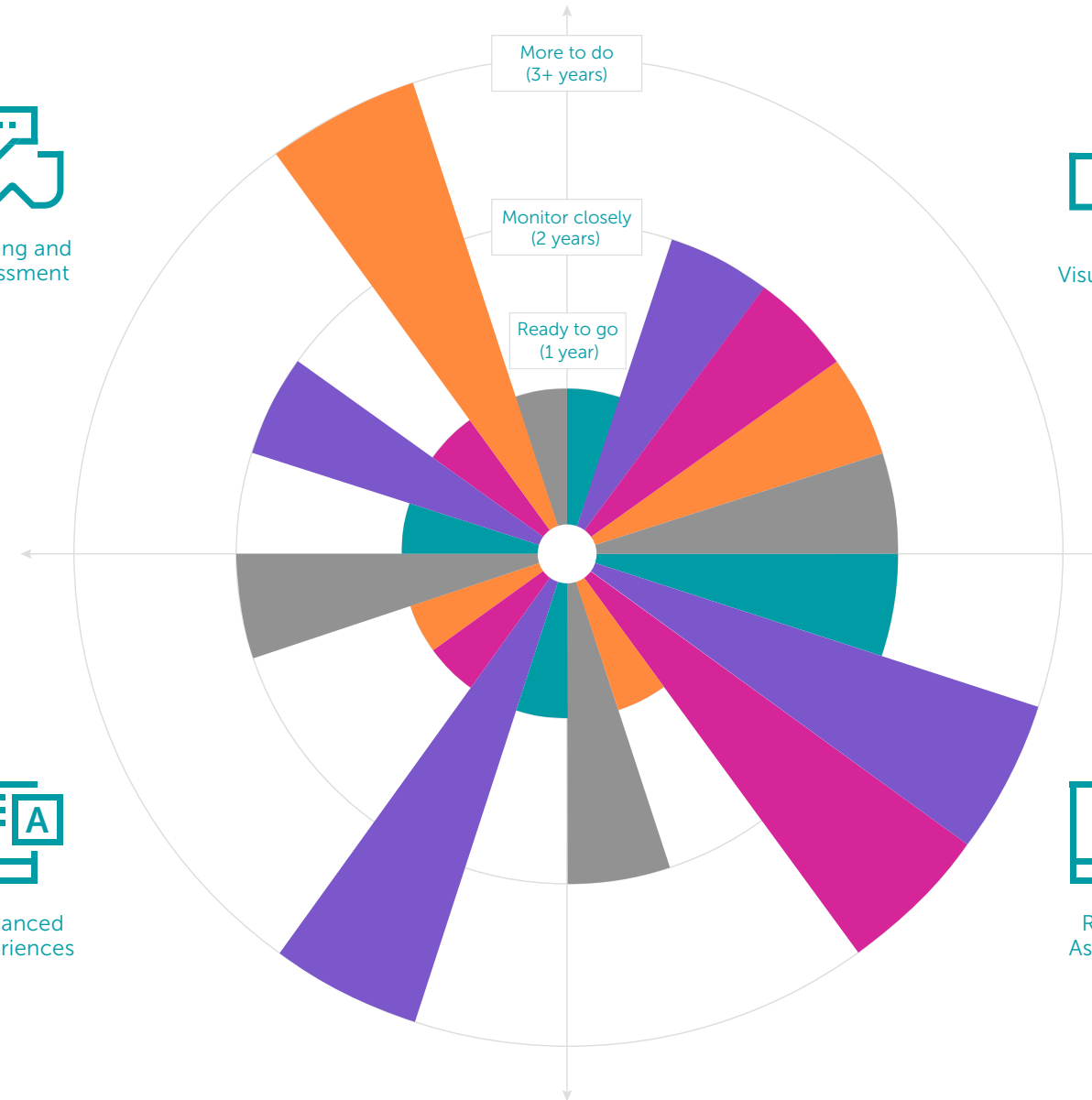
Data Visualisation



Enhanced Experiences



Remote Assistance



“Once you have built the basic data infrastructure to store collaborative data, so that it’s easy to discover and reuse data amongst different organisations, you can then begin to layer applications like AR and VR over it to help visualise information.”

Daniel Clarke

Smart City Programme Manager,
Cambridgeshire County Council

Making it a reality

Our findings have highlighted three areas to discuss and address...

01. How digitally mature are our public services?

Citizen’s trust and understanding of the value of immersive services will be key to enable a data sharing culture. It will also be critical to invest in foundational technologies such as cloud and 5G. This will ensure content, which is at the core of immersive technologies, can be delivered where it is needed with minimal latency.

We believe the future model for public services will be to curate and share data between services to build valuable AR use cases.

02. How do we better support the most vulnerable?

The pandemic has highlighted the importance of community support to those most vulnerable. For example, contactless service delivery will be a key challenge as we build new care offerings. For these, the NHS, Local Government and housing authorities have a unique opportunity to accelerate collaboration.

We believe that immersive technologies offer the potential to help many citizens remain independent and safe in their own homes.

03. How can we design services that drive inclusion?

In a rapidly changing environment, inclusion has never been as relevant and important to address. Dispelling assumptions on who uses technology can be a start. Our [‘A Word from the Wise’](#) campaign found that the older generation are embracing, and open to new technologies. So is it wise to exclude them?

We believe there is a unique opportunity, and duty, to design these immersive services with inclusion as a core principle.

Continue the conversation*

Are you a leader, an innovator, or passionate about driving change in public services? If you are, we'd love to hear your thoughts.

Join our forums as we discuss the challenges and potential for immersive technologies across public services.

Learn more and get involved at www.civica.com/perspectives

CIVICANorthStar*



Civica is one of the UK's largest software companies, with over 30 years of proven expertise in delivering improved outcomes for public services around the world.

At Civica, innovation is in our DNA. We take great pride in putting together exceptional teams and a genuine purpose-driven culture to help everyone be an innovator.

Our innovation lab, Civica NorthStar, is focused on creating enhanced outcomes for public services by applying fresh ideas around data, automation and new technologies. Working with our customers, we harness new thinking and innovative technologies to create enhanced outcomes for our communities.

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