

FROM THE INDUSTRY

6G and JOINER :

IT ISN'T WHAT YOU DO, IT'S HOW YOU DO IT

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IDENTIFYING THE FUTURE DIRECTION OF 6G - ESPECIALLY THOSE APPLICATIONS WHERE IT WILL HAVE THE MOST COMMERCIAL IMPACT - IS THE TELECOMMUNICATIONS EQUIVALENT OF GAZING INTO A CRYSTAL BALL.



Amidst teasingly close dates of 6G being mainstream 'around 2030' there are already heated discussions around use cases. Typically, these reference industry 4.0, augmented reality, autonomous transportation, eHealth and of course, artificial intelligence.

But if we are honest, all such discussions do is swap one nebulous, industry marketing buzzword for another. They tell us nothing about how we will get to these case studies.

LEARNING THE LESSONS OF 5G

If we really want to know what 6G is going to do for us, we need to start by looking at 5G. 5G has proven to be a step-change in capability, with a smaller footprint, more devices and lower latency than previous generations.

But the greatest contribution has been in stimulating the appetite for creativity and sharing knowledge faster than we have ever done before. We have seen this in areas as diverse as delivery drones, sensors for individual healthcare, and enabling edge architectures across the UK.

However, 5G has also shown that designing, testing and developing network

technologies is slow and costly, with little opportunity for co-creation. The reason for that delay is that testbeds usually work in silos, with each network built from scratch every time an innovative technology is assessed.

This is a very inefficient use of resources and funding and means individuals, projects and organisations do not readily benefit from the lessons and discoveries of others. Everything happens in villages, and no-one founds the city.

APPLYING THIS LESSON TO 6G IS WHERE JOINER COMES IN.

JOINER (Joint Open Infrastructure for Networks Research) is a national experimentation platform created to accelerate future communications and networks research, exploitation and adoption.

The platform is designed for proof-of-concept demonstration and early commercialisation. These stages empower researchers, businesses and users alike to gather experimental evidence, advance research translation, generate valuable IP, test and validate services in real-world representative conditions and develop in-demand specialist skills.



This context addresses the questions: “what will be the likely first applications of 6G and when will we see them?” The first point to be made here is that - if the evolution from 4G to 5G is anything to go by, it will be the B2B and enterprise sectors (as opposed to the consumer markets) that drive early adoption.

Extended Reality (XR) - the combination of Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR), is a likely early use case. The opportunities of a mixed ‘real’ and virtual environment with real-time interaction between users and machines is a potentially huge market.

Less immediately obvious but equally impactful could be the incredibly low latency of 6G and its impact on medical technologies, or the self-organisation and self-healing capabilities of a 6G network to support autonomous driving or drone swarming.

In terms of a timeline, things are no less complex. There are currently 302 live 5G networks globally and 47 live 5G standalone (SA) networks according to the Global Mobile Suppliers Association (GSMA). That is a lot of capacity to explore and exploit before we move to 6G. But, even with the challenge of making a return on multi-billion dollar investments in 5G, the current expectation is that 6G will commercially launch around 2030.

That gives research departments, universities, incubators and anyone else in the innovation ecosystem, approximately five years to ideate, iterate and prototype their uses for 6G. This means that breaking the traditional siloes between academia and industry will be more important than ever to ensure 6G innovations are market ready – regardless of if it is a new O-RAN solution, joint sensing and communication application for legacy systems, or an innovative spectrum sharing system at a national scale.

This is especially important for those innovative SMEs who might struggle to gain access to service provider labs. These smaller businesses are typically home to the most creative and cutting-edge developments.

At present, such examples include quantum communications, silicon photonics, agritech, cell-free massive MIMO and digital twins. With such diverse applications, JOINER is also set to strengthen the UK’s influence on global standards and international collaborations. These standards are complex and take several years to develop and finalise - and again, demand keen interaction between commercial companies, academics and industry bodies.

It is this intense, foundational workload that is now driving activity in 6G, and projects such as JOINER are a vital component of this early development.

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