OneWeb - The Opportunity for the UK

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According to press reports, the UK government is a partner in a bid for OneWeb, the UK-headquartered satellite communications company which, following the well-publicised financial difficulties of a major investor, entered Chapter 11 in March. If these reports are true, and the bid is successful, then it is great news for the UK space sector and UK citizens.

OneWeb is a pioneer of a new generation of satellite communications services, built around a “mega constellation” of hundreds of satellites operating in low-earth orbit. These satellites will provide fibre-like quality of service and have a global reach and capacity that has never before been possible, via satellite or otherwise. The company has already launched 74 operational satellites, enough to secure its ITU filings through to 2026 (the only company for whom that is true), all of which are still performing well. It is tremendously significant that the UK intends to take a leading role in this transformational technology.

The Satellite Applications Catapult was created in 2013 to ensure the UK could take full economic and strategic benefit of the new industries and services being established around satellite technologies. For some time, we have been looking at the potential of satellite mega constellations, and our view is that where we are at now is comparable to the early stages of GPS rollout in the late 1980s. Then, we could imagine some future applications for GPS, mostly military, but we had absolutely no idea how it would go on to revolutionise our financial systems or power networks, or any other of the myriad of industries it has transformed.

We are entering the age of driverless cars, robotic ships and autonomous drones, all of which will require truly seamless communications, reliable and available wherever they are, and whatever they are doing. 5G will provide part of the answer, offering excellent coverage in our cities and other highly populated areas. But only satellites will be able to deliver the genuinely global ubiquity the 21st century will need over the oceans, deserts, mountains, highlands and islands and all other areas where fixed 5G infrastructure is either not possible or economically viable. Satellite mega constellations will fill that gap, and over the next 20 years will become a new class of Critical Global Infrastructure, just as GPS has now become. This move to be part of that transformation secures access to and influence over the evolution of this technology for the UK now and into the future.

Satellite mega-constellations have at least as much, if not more, potential than GPS because they are so much more powerful and flexible. OneWeb satellites have been designed to be simple to build and flexible to operate. This is what gives them their lead in the market-place and enables them to be ready to adapt and respond to whatever market demand emerges.

Much press attention has focused on the potential for OneWeb to offer an alternative Position, Navigation and Timing (PNT) solution for the UK, following the UK’s withdrawal from the EU and subsequent exclusion from the Galileo programme. This is but one possible use of OneWeb services, however, an important one. Our analysis concludes that, even without modification, the existing OneWeb satellites could provide a highly accurate timing service. And then, by upgrading the satellites, and providing an appropriate navigation ground component, it would be possible to significantly augment or even replace existing navigation systems.

The crucial factor here is that OneWeb signals are much higher power than those of conventional navigation services. This, combined with characteristics of new antennas, means a OneWeb navigation receiver would be up to 1,000 times more resilient to jamming and interference than a conventional navigation receiver. This is a major improvement to resilience, and means that OneWeb will offer something new into the PNT arena, and not simply another alternative system.

Another important opportunity that OneWeb provides is, finally, to be able to offer superfast broadband to every UK household. According to figures produced by Ofcom in January, there are around 60,000 homes who fall outside of the current Universal Service Obligation by virtue of cost. These households, therefore, have no realistic prospect of ever receiving superfast broadband service via conventional means. OneWeb will be able to serve these customers, cost effectively, by 2023, and provide full 5G capability to those and many more households by 2025. No UK citizen need ever feel digitally excluded again.

There is still work to do to bring this technology vision into reality, and the great news is that we have all

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the skills, talent and expertise we need right here in the UK. We are genuine world leaders in this type of technology. Yet there are no certainties or guarantees - such is the nature of technological ambition. However, what is clear is that to wait until we are certain, always means to wait for somebody else to do it first.

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For more information contact: Tim Pinchin, Head of Marketing and Communications, Satellite Applications Catapult, tim.pinchin@sa.catapult.org.uk, 07741 195955 / 07867 875877

About the Satellite Applications Catapult

The Satellite Applications Catapult is an independent innovation and technology company, created by Innovate UK to drive economic growth through the exploitation of space. We work with businesses of all sizes to realise their potential from space infrastructure and its applications. Based in Harwell, Oxfordshire, the Catapult was established in May 2013 as one of a network of centres to accelerate the take-up of emerging technologies and drive economic impact for the UK. We are a not-for-profit research organisation which is registered as a private company limited by guarantee and controlled by its Board. See sa.catapult.org.uk for more information.

Company Contact:

Satellite Applications Catapult

T. 01235 567999
E. tim.pinchin@sa.catapult.org.uk
W. https://sa.catapult.org.uk

Additional Contact(s):
07741 195955

View Online

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