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Taking the quantum leap: How life science real estate clusters accelerate innovation

The beauty of quantum computing is that it is poised to power groundbreaking discoveries that would dramatically alter what we, as a nation, and globally, are capable of achieving.

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It has the opportunity to revolutionise highly complex and vital fields, such as neuroscience and oncology, speeding up processes that would have once taken hundreds of years to undertake – or even be completely impossible to solve.

The UK quantum computing landscape

A lot of this work is taking place in Oxfordshire, England, home to the National Quantum Computing Centre (NQCC), the UK's national lab for quantum computing accelerating the development of the sub-sector's capabilities and infrastructure.

You'll find many UK quantum companies, from start-ups to global businesses, will collaborate with the Centre in some form. This includes Infleqtion, the world's leading quantum information company, which is the first to install a cutting-edge neutral atom quantum computer at NQCC, and Oxford Ionics, who won a £6 million contract to supply the Centre with its world-record breaking, Electronic Qubit Controlled trapped-ion quantum computer.

The region is fast becoming a key part of the UK's quantum expansion story, which is growing 7.8% per year and contributing an estimated £1.7 billion to the UK economy.

Its growth hasn't gone unnoticed. The previous Government recognised it as one of its five critical technologies, investing £45 million in 2024 as part of its commitment to creating a quantum-enabled economy by 2033. It is vital that this level of support continues under our current Government and funding remains available.

The impact the Quantum Technology Enterprise Centre (QTEC) has made since its inception in 2016 is a great example of how the sector can thrive with the right support. Funded by the Engineering and Physical Science Research Council as a skills and training hub in Quantum Systems Engineering, the centre has supported the creation of at least 28 active quantum companies and, according to a 2019 report, a third of the UK's funded Quantum Start-ups originated here. In fact, QTEC alumni companies have now raised over £63 million in equity, contract and grant funding and created over 220 new highly skilled jobs for the UK Quantum Workforce.

The need for close collaboration

But, if the UK is to help more start-ups grow into established, impactful businesses, we must ensure they have access to space in locations that enable their growth.

Close proximity between research institutions such as the University of Oxford's Begbroke Science Park, centres such as NQCC, and other forward-thinking life sciences and technology companies, is key as it promotes greater innovation via enhanced cross-sector collaboration.

In oncology, for example, Infleqtion anticipates it will be able to use quantum computing technology to obtain more accurate and efficient simulations of molecular behaviour by efficiently representing molecules using the quantum state of the qubits (the basic unit of quantum information). They also expect it to enhance medical imaging by improving how the underlying quantum data from techniques, such as MRI, and CT scans, are processed and interpreted.

When it comes to the space itself, it goes without saying that a chemistry lab will look very different to a quantum computing lab. Occupiers' requirements vary, but – as an example – quantum computers, which rely upon superconducting qubits, need to be kept at temperatures as close to absolute zero as possible because heat can cause errors and this can typically only be achieved through cryogenic cooling.

Future global positioning

There is also no denying that quantum computing companies are also naturally power hungry, and investment in the UK's power networks will be required to avoid developers / occupiers having to wait, in some cases up to six years, to access the level of power needed.

The UK quantum sector's potential is largely unknown, but it is only set to continue growing as large tech companies such as PsiQuantum relocate from Silicon Valley to the UK for cryogenic expertise in the UK and manufacturing and supply chain in Oxfordshire.

If Oxford and the UK more widely can advance its reputation as a leader in quantum, we will see some really encouraging breakthroughs in science, technology, and innovation, which have the potential to accelerate economic growth.

Delivering the right space in the right locations will be key to this.

About the author

Yi-Chien (Yvette) Lu is life science research analyst at Ironstone Asset Management, the investment adviser to Life Science REIT. Her experience spans across the life sciences and investment sectors. Previously, she worked at Nomura's Healthcare Investment Banking team for M&A and private placement advisory, and her corporate days counted Foxconn, a Fortune 22 tech company, where as a corporate development manager she sourced digital health investment opportunities and medical technology acquisition targets. Lu was a founding member of the Oxbridge Biotech Roundtable (OBR), which runs one of the largest life sciences accelerator programmes, OneStart, for young academics. She graduated with a DPhil (PhD) in Oncology from the University of Oxford, an MSc in Immunology from Imperial College London, and is certified in UK Financial Regulation and Capital Markets by the Chartered Institute for Securities & Investment (CISI).