Tomorrow's Affairs
Analysis of today
Assessment of tomorrow

By: Elise Quevedo

Unlocking the full potential of quantum computing

I spent part of my time at Mobile World Congress Barcelona this year exploring a technology area that still feels like science fiction to many people. Quantum computing.

During a short visit to see the latest developments around quantum research, I had the opportunity to learn more about IBM's Quantum System Two.

A system that is both impressive to see in person and beautiful to the naked eye, with its intricate design and colours. We are only at the beginning of understanding what quantum computing can achieve.

The UK recently announced that its most powerful quantum computer will be at the University of Cambridge through a strategic partnership with the quantum technology company IonQ.

For anyone following the global race for quantum leadership, this announcement reflects a growing recognition that quantum computing is moving from theoretical exploration towards practical national infrastructure.

I wrote in October 2025 that Europe had set a lofty target to dominate the world of quantum technology. That statement was not aspirational rhetoric.

Europe has been building the research ecosystem required to compete with the United States and China in this next era of computing.

The Cambridge and IonQ partnership shows that the strategy is moving forward.

Why Cambridge?

The decision to place the UK's most powerful quantum computer at the University of Cambridge is strategic.

Cambridge has a long history of scientific discovery. From physics to mathematics to computer science, the university has been a catalyst for breakthroughs that changed the world.

IonQ brings commercial expertise to the partnership. The company has emerged as one of the most prominent players in trapped-ion quantum computing.

IonQ employs trapped ions to preserve qubit stability and enhance coherence times, in contrast to certain rival methods that depend on superconducting qubits. One of the biggest engineering problems in quantum computing is still stability.

The partnership will place IonQ's sixth-generation 256-qubit system on the Cambridge campus while giving researchers access to IonQ's quantum cloud platform to explore applications in computing, networking, sensing, and security.

IonQ leadership framed the collaboration as a bridge between research and real-world deployment.

> Quantum computing requires access to machines, experimentation environments, and a pipeline of talent

Niccolo de Masi, Chairman and CEO of IonQ, said:

"This historic agreement with Cambridge deepens IonQ's commitment to the United Kingdom and accelerates our technology platform with novel research at one of the world's most storied physics powerhouses."

From the university's perspective, Professor Deborah Prentice, Vice-Chancellor of Cambridge, highlighted the broader national impact:

"We're proud that Cambridge is at the heart of the UK's next computing revolution. This new and ambitious partnership is the first of its kind for a UK university."

Those statements capture the project's larger ambition. This initiative is about building a national ecosystem that connects academia, industry, and government research.

By placing advanced quantum infrastructure directly inside a leading research university, the UK creates an environment where students, scientists, and startups can experiment with quantum algorithms, develop new materials, and explore industrial applications.

Quantum computing requires access to machines, experimentation environments, and a pipeline of talent. Cambridge is now becoming one of those environments.

Quantum Momentum in 2026

The first quarter of 2026 has already produced significant developments in the quantum computing landscape. Major technology firms continue to invest heavily in the field.

IBM continues to expand its quantum roadmap, while companies such as IonQ, Quantinuum, and Rigetti advance different architectural approaches.

The governments are also making more investments. The National Quantum Initiative is still being funded by the United States. China has invested billions in its research facilities and quantum communication networks. To better coordinate research among its member states, Europe is bolstering its Quantum Flagship initiative.

This larger momentum is directly reflected in the Cambridge announcement. From curiosity to essential infrastructure, quantum computing has evolved.

> Quantum computing now sits on the agenda of national economic strategy

Countries view it as a fundamental technology that affects materials science, cybersecurity, medication discovery, logistics optimisation, and climate prediction.

Massive combinatorial complexity problems are difficult for traditional computing systems to handle. New solutions to these problems are promised by quantum algorithms.

To accelerate pharmaceutical development, researchers are investigating quantum computing applications for chemical simulations.

Financial firms study portfolio optimisation methods that require substantial processing power. Scientists studying climate change explore quantum methods for simulating complex atmospheric systems.

These possibilities explain why quantum computing now sits on the agenda of national economic strategy.

The economic implications for the UK

The decision to anchor a major quantum system at Cambridge also carries direct economic implications for the United Kingdom.

Advanced research infrastructure is the focal point of innovation clusters. Stanford University and early semiconductor research served as the foundation for Silicon Valley.

Boston's academic atmosphere made it a centre for biotechnology. Silicon Fen, a powerful technology cluster, is already located in Cambridge, UK.

Adding a leading quantum system strengthens that environment. Startups working in quantum software, quantum algorithms, and quantum security will gravitate towards locations that offer access to experimental hardware. Venture capital follows talent and opportunity. Academic institutions attract researchers from around the world.

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In turn, this ecosystem effect creates long-term economic benefits. The UK government has already committed billions through its National Quantum Technologies Programme.

The IonQ partnership amplifies that investment by placing world-class infrastructure directly within a research university environment.

The result could position the UK as one of Europe's leading quantum innovation hubs. If the technology reaches a practical scale, nations that invested early will gain a strategic advantage. The UK appears determined to be among them.

Future scientists have opportunities thanks to collaborations like the one between Cambridge and IonQ. They provide researchers with tools that were unimaginable to earlier generations.

The field of quantum computing is still in its infancy. Error correction is still a problem. Although hardware stability is still improving, much technical innovation is still needed. Slowly, useful commercial applications are starting to appear.

Observing a quantum system up close is like entering a crossroads where engineering fact and science fiction collide. The potential of science and technology is something we have only just begun to explore.

Knowledge, teamwork, and vision are key components of the global contest for leadership in quantum computing. All three are represented by the collaboration between IonQ and the University of Cambridge.

It serves as a reminder that knowledge and curiosity remain essential to the future of innovation, opens up possibilities for academics and businesses, and supports Europe's goals in quantum physics.

Standing in front of a quantum system earlier this month, I felt the same excitement that engineers must have felt when they saw the first computers come to life decades ago.

Who will unlock the full potential of quantum computing first?