Quantum Speech - As Delivered
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It is a pleasure to be here at the Commercialising Quantum Global conference. For five years now, this annual conference has been a leading forum for discussing how we translate advances in quantum technology into commercial applications. I'd like to thank The Economist for organising this event and for their work in covering the importance of quantum technology in their publications.

Everyone in this room is probably very familiar with the argument over why quantum matters. Each of us knows that quantum is a general purpose technology, with applications as wide and significant as artificial intelligence. We know that quantum can be used for sensing the physical world with unparalleled precision, revolutionising medical imaging and providing an alternative to satellites for navigation. We know that quantum-key distribution can lock-in more secure communication networks than traditional encryption methods. Which is good news and will be urgently needed, given that quantum computers will soon be able to break through today's encryption protocols, covering everything from banking to bitcoin.

Most exciting of all, we know that quantum computers have much stronger compute capabilities than traditional digital computers. Replacing the 1s and 0s bits of digital machines with atomic qubits will revolutionise computing and allow more complex equations and modelling.

Admittedly, we do not yet know which approaches to quantum computing are likely to make the fastest or furthest progress. The future could belong to superconducting quantum computers. These are already commercially available, but require incredibly cold temperatures to function. They are also limited by high error rates and the fact that only adjacent qubits can interact. The future could belong to trapped ion computers. These use ions held in electromagnetic fields and have lower error rates but work more slowly. Neutral atom computers, which use laser arrays, could be the best way forward. So too could be photonic quantum computers, which transmit particles of light along optical circuits. Quantum computing could be dominated by any of these approaches, a mixture of them, or some other approach.[1]

However, we are confident that whichever kinds of quantum computing succeed, they will have the potential to unlock dramatic scientific progress. Breakthroughs could be made in areas like new drug discovery, creating cheap and climate-friendly fertilisers, and advanced weather and disaster forecasting.

We know all that. By and large, though, the general public does not. While AI looms large in the public consciousness, the importance of quantum technologies is underappreciated. It does not always command the attention it deserves among policymakers.

That is why Tony Blair and I, despite our past political differences, worked together last year to author a paper on quantum technologies. When I was the Leader of the Opposition, most

[1] https://cepa.org/article/the-quantum-horse-race-is-underway-with-no-clear-favorite/

of my energies were focused on trying to politically destroy Tony Blair! That was the least successful part of my life. Now, I find that there is practically nothing that we disagree on. Both of us know that technology and innovation are the key ingredients for the UK's economic prosperity and national resilience. That is why we have called on the Government and MPs of all parties to make tech leadership our New National Purpose, through a series of papers. Our quantum report is the seventh in this series.

In our quantum paper, Blair and I argue that having a leading quantum sector is critical for Britain's growth and security. We warn that while recent Governments have supported quantum, more interventions are needed around research and development, access to capital, and building resilience. A relatively small number of people in Westminster and Whitehall understand the importance of this technology. So it is incumbent on all of us to make the case for quantum whenever the opportunity arises.

While Britain has a strong starting point in the race, there is of course a risk of the country squandering this position. Our country ranks third globally in academic research into quantum. The UK is home to the second-highest number of quantum startups in the world. British organisations are increasingly deploying quantum technology in the real world settings. For example, the Royal Navy is trialling quantum navigation systems over the Arctic with researchers from Imperial College.[2] Only a few weeks ago, the GPS on the then-Defence Secretary's plane was jammed when flying close to Russia.[3] Quantum navigation systems can help provide a more secure alternative to satellite-based systems.

Meanwhile, Bristol University has demonstrated the first long-distance secure transfer of data over a quantum communications network. As Chancellor of Oxford, I am proud of the role that Oxford is playing in the UK's quantum ecosystem. We are home to a number of leading British quantum startups, including Oxford Ionics and Oxford Quantum Circuits, which has just received a £100 million investment from the British Business Bank. Exeter College, Oxford is working to help Britain lead in this field with plans for a whole quantum innovation district at the western gateway of the Oxford-Cambridge Growth Corridor.

While Britain is a global leader in quantum research, we fall short in converting this research into commercial applications. Action is needed to ensure the value of innovation generated by UK quantum research remains within our country, rather than slipping away. Broadly speaking, there are three problem areas.

First, research and development. The UK is a leader in long-term foundational research. However, we need to do more to target our R&D towards overcoming specific engineering challenges that stand in the way of commercial deployment of quantum technologies. Progress in areas like deciding the most efficient paths for qubits to interact and reducing errors in quantum calculations would go a long way in supporting commercialisation.

[2] https://www.royalnavy.mod.uk/news/2025/december/19/20251219-royal-navy-trials-quantum-tech-with-imperial-college-london
[3] https://www.theguardian.com/world/2026/may/24/gps-jammed-on-raf-jet-carrying-uk-defence-secretary-close-to-russian-border

Second, scale. With some notable exceptions like the recent investment into OQC, many of Britain's leading quantum companies do not have access to sufficient domestic capital. For example, last year Oxford Ionics was acquired by a globally-leading American quantum company in a $1 billion deal. Such a valuation is a phenomenal achievement that underlines the strength of the UK's talent ecosystem. But imagine how far our talented quantum companies could go if they had the British capital they needed to grow into global leaders in their own right.

Universal Quantum, another UK quantum startup is reportedly seeking $100 million in funding from investors. As I understand it, the company is resisting proposals tied to a New York listing because they want to keep the business independent and rooted in the UK. That said, most of the interest is coming from Silicon Valley.[4]

Third, resilience. The UK quantum sector lacks the support of a wider ecosystem. For example, British quantum startups are dependent on foreign suppliers for key components, including cryogenics for cooling quantum computers. The UK also lacks the infrastructure needed for scaling quantum companies, such as advanced packaging facilities. Without the support of a broad and resilient ecosystem, British quantum companies will be forced to move abroad in order to scale.

If these three constraints are not overcome, there is a real risk that the UK falls behind in quantum. Falling behind would mean the UK misses out on the growth opportunities of the technology. Recent analysis by McKinsey found that quantum computing could create up to $2.7 trillion of economic value worldwide in the next decade. Some of the industries set to benefit most are key to the future of the UK economy. This includes the chemical and life sciences sector, where quantum computing will unlock more powerful molecular simulations. The financial services sector will also use quantum computing to better test risk scenarios.[5]

Tech sovereignty also increasingly matters in today's age of geopolitical upheaval. Most of us will be aware of Teddy Roosevelt's observation that to succeed internationally, a country needed to "speak softly and carry a big stick". In today's world of technological acceleration, though, big sticks are no longer sufficient. You also need a deep stack. Given quantum's national security applications, some degree of sovereignty in this area will be critical.While full stack autonomy would be far too difficult to achieve, by doubling down on our areas of expertise and working with allies around the world we can aim for greater strategic interdependence, rather than being completely dependent.

One area of specific importance for tech sovereignty is post-quantum cryptography. The day when quantum computers are able to break classical encryption methods is inching ever closer and is expected by the 2030s. Anticipating this "Q-Day", Britain's enemies are already stockpiling our encrypted communications to break open. Companies and countries around the world are scrambling to patch their cyberdefences to prevent existing vulnerabilities being exposed by new AI models like Claude's Mythos. The threat from quantum, though, is

[4] https://thequantuminsider.com/2026/05/26/uk-quantum-startup-draws-interest-from-u-s-spacs-the-telegraph-reports/
[5] https://www.mckinsey.com/capabilities/mckinsey-technology/our-insights/mckinsey-quantum-technology-monitor-2026-a-commercial-tipping-point

on another scale entirely. Quantum computers will not expose small flaws in the cybersecurity of encrypted software, but break its encryption altogether. Too few organisations are taking serious steps to prepare for this more challenging eventuality.

So how does the UK ensure it is not left behind in the coming quantum revolution? How do we attain the economic growth and national security dividends of a strong domestic quantum sector?

The recipe for success in quantum is similar to other technologies, like artificial intelligence. We should make certain the UK has the required talent, by ensuring our education and visa systems facilitate access to leading scientists and engineers. We should back pioneering institutions, from universities to ARIA, to support both tech advances and commercialisation. We should adopt a pro-innovation approach to regulation, through sandboxing opportunities and making sure that physical infrastructure like research laboratories, can be built. Most importantly of all, we should ensure that tech startups have access to sufficient domestic capital to grow and scale within the UK.

Each of these themes have run through the New National Purpose papers that Tony Blair and I have written together on supporting Britain's technology sector. For the most part, politicians and civil servants are waking up to the importance of artificial intelligence. They have yet to do so with quantum. This is frustrating, given that the global AI market has already concentrated around the US and China, while there is greater scope for Britain to play a significant role in the global quantum market.

The very complexity of quantum mechanics which makes this branch of science so integral to our country's future can be disconcerting for MPs and ministers. There are few scientists in Westminster. Ask the average MP about qubits and they are most likely to think you are talking about ancient measurements. Ask them about the uncertainty principle, and they'll think you are talking about whether Keir Starmer will still be Prime Minister next week.

I admit I've struggled to understand aspects of quantum mechanics myself. Hugh Everett's "many worlds theory", which holds that all possible outcomes are manifested in some other world, is particularly challenging. Although it is gratifying to know that somewhere out there, in some far-flung parallel universe almost identical to our own, there is a William Hague who defeated Tony Blair after all!

That said, there are signs that Westminster is finally getting to grips with quantum. In 2023, Rishi Sunak's National Quantum Strategy set out key actions to support the UK's quantum sector. This included a focus on research hubs, challenge-led innovation funding, and talent programmes.[6]

6 https://assets.publishing.service.gov.uk/media/6411a602e90e0776996a4ade/national_quantum_strategy.pdf

To their credit, the Starmer Government has taken a lot of these ideas forward. Shortly after the general election, the government brought forward a plan for five new quantum research hubs across the country.[7]

Earlier this year, the Technology Secretary Liz Kendall committed £2 billion to invest in the sector. Her plans include funding to help companies scale quantum computing and develop new uses in areas like pharmaceuticals and financial services. She is also investing in quantum sensors and navigation, which could accelerate innovation in medical diagnostics. More support for the network of quantum research hubs and Edinburgh's Quantum Software Lab was also announced.[8] With Keir Starmer's administration looking like it is on life support, we must hope that any imminent new administration will remain as committed to supporting quantum.

All of these announcements are good progress, but with other countries around the world investing heavily in quantum, the UK will need to be even more ambitious. More will need to be done to address the three challenges I outlined earlier. Some of the options for achieving this were set out in my New National Purpose paper with Tony Blair.

First, we need to target our R&D towards specific engineering challenges that stand in the way of commercialisation. One way to achieve this would be to pilot a Quantum Translational Research Group aimed at overcoming short-term engineering barriers to commercial deployment. There are different models for how such a group could work. Perhaps a small R&D organisation in the mould of ARIA, or a new national scale quantum laboratory. Either way, an organisation like this would mirror the work of Finland's Technical Research Centre. This is already working with Finnish quantum companies to overcome engineering constraints.

Another area related to R&D which the Government could consider is fiscal incentives in key sectors. Ministers could offer R&D tax reliefs relating to quantum or reduced employer National Insurance contributions for quantum-related hires in sectors like finance and pharmaceuticals. This would enhance R&D in commercial uses of quantum and strengthen the market for UK quantum companies.

Second, we need to ensure Britain's leading quantum companies are able to access the funding they need to scale into global leaders. This is one of the areas in which the current Government is making the most progress, through their £1 billion procurement plan for quantum computers.[9] It will be vital to ensure that this funding is well-spent, with a focus on real world applications in areas like healthcare and defence, rather than hitting technical benchmarks.

Going further, the Government should consider appointing quantum procurement champions with expertise in the technology in each key department. Doing so would allow departments

[7] https://www.gov.uk/government/news/over-100-million-boost-to-quantum-hubs-to-develop-life-saving-blood-tests-and-resilient-security-systems
[8] https://www.gov.uk/government/news/uks-quantum-leap-tohelp-beat-diseasedeliver-high-paid-jobs-and-strengthen-national-security-as-first-country-in-the-world-to-roll-out-quantum
[9] https://www.gov.uk/government/news/uks-quantum-leap-tohelp-beat-diseasedeliver-high-paid-jobs-and-strengthen-national-security-as-first-country-in-the-world-to-roll-out-quantum

to perform horizon scanning for possible new use cases of quantum in areas like defence, healthcare, and financial services. These champions could also provide regulatory sandboxes, to help quantum entrepreneurs test their technologies in a safe way.

These procurement champions could also offer advance market commitments. These work by setting out a commitment to purchase or subsidise a product if someone can invent and produce it to a high standard. They have been used to galvanise the creation of new vaccines, and in last year's Budget, the Chancellor also announced one to back new AI chips.[10] Similar advance market commitments for quantum technologies could galvanise the sector and unlock new use cases.

Third, the Government must help build resilience within the quantum sector by ensuring that the UK has the necessary supply-chain depth. In practice this will require action to map capabilities and identify gaps. Then strategic bilateral partnerships will need to be agreed with a range of different allied countries to help address these gaps.

More action will also be needed to ensure companies have sufficient access to quantum-enabling infrastructure. Given the importance of cooling systems for quantum computers, expanding domestic capacity in cryogenics will be particularly key. Here there is potentially a role for the National Wealth Fund in providing co-investment to de-risk private investment.

Drawing this argument together, each of us knows how important having a strong quantum sector is for the UK's future prosperity and security. However, quantum's importance isn't always recognised in Westminster or in the wider public. While a lot of good progress has been made under the Sunak and Starmer Governments, we need to keep the momentum going. If there is a change of Prime Minister, it will be vital that the next Government remains as committed to supporting quantum.

We need to go even further in addressing the three key challenge areas for the UK; research and development to unlock commercialisation; domestic funding to help quantum startups grow domestically; and a resilient quantum ecosystem built on partnerships with a range of allied countries and domestic quantum infrastructure. By taking further steps in these areas, the Government can help keep Britain at the front of the pack in the international race for quantum.

So let us all resolve to keep making the case for why quantum matters and setting out how ministers can support it. Moreover, let us all hope that ours is one of those "many worlds" in Hugh Everett's theory in which Britain leads the way in this vital technology.

Thank you.

[10] https://www.gov.uk/government/news/budget-backs-technology-firms-to-start-up-scale-up-and-stay-in-britain-to-drive-growth-and-national-renewal
https://www.ft.com/content/d4d9d091-5fd7-4c20-a3ca-f68f580f7d6b?syn-25a6b1a6=1