2026 Predictions

Quantum Computing: From Experimentation to Strategic Positioning

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The quantum computing industry is at a pivotal point. Although headlines promise groundbreaking breakthroughs, the reality in 2026 is more complex and, in many ways, more fascinating.

Organizations are progressing beyond simple testing toward strategic development, building the capabilities, partnerships and expertise needed to leverage quantum advantage ... when it arrives. This transition from hype to practicality will define 2026 and distinguish vendors able to deliver real value from those just making unrealistic promises.

Today, quantum computing remains in the research and proof-of-concept stage, with applications limited to toy problems that show potential rather than provide practical business value. By 2026, the focus will shift from simply counting qubits and technical demonstrations to building robust hybrid infrastructures, developing quantum-ready workforces and forming the partnerships that will be important when fault-tolerant quantum computers emerge in the early 2030s.

1. Hybrid Quantum-Classical Infrastructure Will Become the Industry Standard

By 2026, the quantum computing industry will move decisively away from standalone quantum systems toward integrated hybrid architectures that combine quantum processors with high-performance classical computing. This shift reflects a fundamental truth: quantum computers will always need significant classical compute resources for problem decomposition, error correction and validating results.

Organizations will implement platforms that smoothly allocate computational tasks between quantum and classical processors, with orchestration layers deciding which components run on which architecture. This "quantum-centric supercomputing" strategy will dominate industry conversations, as major companies heavily invest in integration frameworks that offer unified interfaces to users.

However, this convergence brings both opportunities and risks. On one side, hybrid architectures allow organizations to extract value from today's noisy quantum processors by shifting error-prone calculations to classical systems. On the other hand, the combination of quantum and classical computation can obscure which part actually provides the performance gains, potentially enabling vendors to claim "quantum advantage" for workloads that are mainly solved using classical computing.

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The impact: Organizations with strong traditional high-performance computing (HPC) capabilities will gain strategic advantages in quantum computing by providing complete solutions rather than just isolated quantum processors. Enterprises evaluating quantum investments should prioritize vendors who demonstrate real integration expertise and clear performance attribution between quantum and classical components.

2. Enterprise Quantum Strategies Will Prioritize Skills and Partnerships Over Hardware

While quantum hardware continues to advance, with superconducting systems achieving gate fidelities around 99.99% and spin qubit technologies emerging as credible alternatives, the key factor for organizational quantum readiness in 2026 will be human capital and ecosystem positioning, not hardware access.

Forward-thinking organizations will invest in developing quantum literacy among technical teams, form partnerships with research institutions and participate in government-funded quantum centers and consortia. These early investments in capability building will position organizations to act swiftly when practical quantum applications become available, as competitors struggle to develop expertise from the ground up.

We will observe greater cooperation between industry and academia, with companies funding doctoral students and seconding staff to national quantum computing facilities. The benefits of these investments go beyond quantum expertise, as quantum algorithms and quantum-inspired classical algorithms influence traditional HPC and artificial intelligence (AI) workflows.

Certain verticals will ramp up their quantum research: chemical manufacturers aiming for better catalysts and process improvements, semiconductor companies simulating quantum effects in next-gen chips, and pharmaceutical firms exploring quantum machine learning for drug discovery. While real-world uses are still years away, organizations doing systematic research now will identify which use cases deserve future quantum investments and which are better suited for classical methods.

The impact: By 2026, quantum computing will be seen as a long-term strategic capability that requires ongoing investment in people and partnerships, rather than just a technology issue to be solved by buying hardware. Organizations that start now in developing quantum-literate workforces will gain significantly when practical quantum advantage becomes available.

3. Transparency and Responsible Innovation Will Differentiate Market Leaders

The quantum computing industry has long struggled with the tension between generating excitement and technical honesty. By 2026, this tension will reach a critical point as companies demand proof of real progress beyond marketing hype. Organizations that are open about current limitations, realistic timelines, and honest comparisons to classical methods will build trust that leads to lasting customer relationships.

The industry will continue to see demonstrations of quantum computational speedup using processors with hundreds of qubits. However, none of these demonstrations actually solves practically useful problems. The gap between ‘quantum advantage’ on carefully selected

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benchmark problems and 'practical quantum advantage' in solving real business challenges will become impossible to ignore.

We anticipate increased scrutiny of vendor claims, as advanced buyers require thorough benchmarking against top-tier classical optimizers and simulators. Some vendors who overpromised will face reputational damage as enterprises see that toy problem demonstrations do not translate to real-world deployments. This reckoning will favor vendors who have upheld technical integrity, even if it meant admitting limitations.

Transparency will extend beyond performance claims to cover data sovereignty and security. As geopolitical tensions rise and export controls on quantum technologies become stricter, companies will seek clear information about three things: where quantum computations occur; who controls access to algorithms and results; and what safeguards are in place to prevent political interference. Vendors offering on-premises quantum systems with full customer control will attract organizations that prioritize data sovereignty over the convenience of cloud access.

The impact: Market consolidation will accelerate as vendors that cannot demonstrate real technical progress lose credibility and funding. Organizations that combine advanced capabilities with governance based on transparency and accountability will become trusted partners for the long-term quantum journey.

4. Post-Quantum Cryptography Will Drive Near-Term Quantum Readiness Investments

While practical quantum computers capable of breaking current encryption remain a decade away, 2026 will see accelerated deployment of post-quantum cryptography (PQC) across critical infrastructure. Government mandates will require financial services, telecommunications, healthcare, and other regulated industries to transition to quantum-resistant encryption algorithms, creating the largest near-term commercial opportunity in quantum-adjacent technologies.

This transition represents a massive undertaking, requiring organizations to inventory encrypted assets, assess cryptographic dependencies, and systematically replace vulnerable algorithms across complex IT estates. The timeline for this transition will extend through the end of the decade, but 2026 will mark the shift from planning to active implementation as regulatory deadlines approach.

Organizations that position PQC deployment as quantum readiness – rather than treating it as separate from quantum computing initiatives – will create internal alignment between security teams, infrastructure teams and quantum research groups. This alignment enables organizations to develop comprehensive quantum strategies that address both near-term cryptographic risks and long-term computational opportunities.

The impact: Post-quantum cryptography will become the entry point for broader quantum conversations with enterprise customers, creating immediate revenue opportunities for vendors who can deliver integrated solutions spanning security, compliance, and quantum readiness. Organizations that successfully deploy PQC will have demonstrated the organizational change management capabilities required for future quantum technology adoption.

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5. Geopolitical Competition Will Reshape Quantum Technology Partnerships

The quantum technology landscape in 2026 will be increasingly shaped by geopolitical factors, with export controls, government funding priorities, and regional alliances influencing technology development and commercial collaborations. Every developed nation now maintains a quantum strategy with significant public funding, driven by fear of missing out and recognition that quantum computing offers potential military and economic advantages.

Japan's move toward Horizon Europe association (European research programs) and the European Commission's openness to collaboration with Japanese technology providers will create new partnership opportunities, especially for organizations positioned to connect Eastern and Western quantum ecosystems. Regional quantum excellence centers — such as the UK's National Quantum Computing Centre and similar initiatives across Europe and Asia – will become key sites for industry-academia collaboration and testbeds for pre-commercial quantum systems.

However, export controls on quantum technologies will limit international collaboration and market access. The criteria for controlled technologies – often systems exceeding certain qubit counts and gate fidelities – will force strategic decisions about which markets to focus on and which partnerships to develop. Organizations with domestic manufacturing capabilities and regional partnerships will handle these restrictions more effectively than those relying on global supply chains.

Public funding will continue to rise, with governments investing in both fundamental research and commercialization pathways. The focus between these priorities will differ by region, with some nations emphasizing long-term scientific leadership while others aim for near-term commercial gains. Quantum hardware startups will multiply as government funding reduces risks for early-stage ventures, while quantum software firms will consolidate since sustainable businesses need integration with existing enterprise workflows rather than standalone quantum applications.

The impact: Success in quantum computing will depend on navigating complex geopolitical dynamics, with technology development becoming more regional and partnerships shaped by sovereign technology goals. Organizations that build strong positions in government-funded quantum initiatives will gain better access to emerging technologies and talent pools.

The 2026 Quantum Reality

By 2026, quantum computing will have evolved from pure research curiosity to a strategic technology demanding ongoing organizational investment. The merging of hybrid quantum-classical systems, focus on skills and collaborations, commitment to transparency, deployment of post-quantum cryptography, and geopolitical competition will create an ecosystem dedicated to establishing the foundations for future quantum advantages rather than seeking premature breakthroughs.

We will shift from an era where vendors compete on qubit counts and technical demos to one where ecosystem strength, integration skills, and customer trust define market leadership. Quantum computing will evolve from a technology story to a business strategy

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narrative, with organizations preparing for the long-term journey toward fault-tolerant quantum computers expected in the early 2030s.

Companies that combine technical excellence with pragmatic integration, transparent communication, and strong partnerships will be best positioned to deliver value as quantum computing moves from potential to reality. Those that prioritize hype over substance will face increasing credibility challenges as sophisticated buyers demand proof of real progress.

The future of quantum computing involves developing the capabilities, partnerships, and expertise necessary to harness quantum advantage when it becomes available. As we near 2026, organizations investing in these foundational areas are differentiating themselves from those still focused on flashy demonstrations of trivial problems.

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Michal Krompiec leads the Quantum Application Research group at Fujitsu Research of Europe. His team, located in the UK and Spain, develops quantum computing algorithms for applications in chemistry, quantum physics and data science.

Prior to joining Fujitsu in 2024, Michal worked at Quantinuum, where he managed quantum application projects, and at Merck KGaA, as a materials scientist and computational chemist. Michal holds a PhD in organic and physical chemistry.

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Serban Georgescu is Chief Executive Officer of Fujitsu Research of Europe, the European research arm of the Fujitsu Group.

With over 20 years of research experience, he leads innovation efforts across the UK, Spain, and Israel. Serban holds a PhD from the Department of Quantum Engineering and Systems Science, School of Engineering, The University of Tokyo (2009) and a BSc in Applied Mathematics.

His career spans academia and industry, from postdoctoral research at ETH Zurich to leadership in industrial AI. He has made notable contributions to High Performance Computing, combinatorial optimisation, and AI for manufacturing, transport, and genomics.

He is committed to bridging research and business to deliver technologies with real-world impact.

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