CONCEPT

Quantum Computing for Business Leaders: Use Cases, Risks and Post-Quantum Readiness

18 – 22 January 2027
London - Central London four-star



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Introduction:

Quantum computing for business leaders is no longer a physics curiosity: boards are asked whether to fund pilots, which vendor claims to trust and how soon today's encryption becomes exposed. Without a plain-language grasp of qubits, hardware limits and the algorithms that matter, organisations either overspend on hype or delay post-quantum preparation until data harvested today is decrypted tomorrow. This Core Concept course gives executives the vocabulary and judgement to screen quantum use cases, question vendors and sponsor cryptographic migration. Participants finish by producing a Quantum Readiness Roadmap for their own organisation.

Course Objectives:

- Explain qubits, superposition, entanglement and measurement to boards and investment committees without mathematics
- Assess vendor performance claims against hardware limits such as decoherence, gate noise and error-correction overhead
- Screen optimisation, simulation and search problems for realistic quantum advantage against classical alternatives
- Estimate organisational exposure to the quantum threat to public-key encryption using Mosca's theorem and a cryptographic inventory
- Sponsor a post-quantum migration programme aligned with NIST FIPS 203, FIPS 204 and FIPS 205 and crypto-agility principles
- Compile a Quantum Readiness Roadmap with use-case priorities, talent, partnerships and migration milestones

Target Audience:

- Executives responsible for corporate strategy, innovation portfolios and long-range technology investment
- Technology and architecture leaders accountable for platform roadmaps and vendor selection
- Risk and information security leaders who oversee encryption, data protection and long-lived confidential records
- Finance, research and operations leaders in sectors where optimisation, pricing or molecular simulation drive value
- Board advisers and transformation directors who brief directors on emerging computing paradigms

Course Outline:

Day 1: Quantum Fundamentals in Plain Language

- Classical Bits Versus Qubits: Superposition and Measurement Explained
- Entanglement and Interference as Sources of Computational Power
- Quantum Advantage, Quantum Supremacy Claims and Their Business Meaning
- Quantum Technology Hype Cycle and Investment Signal Reading
- Executive Quantum Literacy Baseline Using a Self-Assessment Grid

Day 2: Hardware Approaches, Limits and the Access Landscape

- Superconducting, Trapped Ion, Photonic and Neutral Atom Qubit Platforms Compared
- Decoherence, Gate Noise and the NISQ Era Constraints
- Quantum Error Correction: Logical Versus Physical Qubit Overhead
- Quantum Cloud Access Models: Hardware Vendors, Hyperscaler Marketplaces and Simulators
- Vendor Claim Scrutiny Checklist: Qubit Counts, Fidelity and Roadmap Credibility

Day 3: Quantum Algorithms and Industry Use Cases

- Optimisation Approaches: Quantum Annealing and Hybrid Quantum-Classical Solvers
- Quantum Simulation for Chemistry, Materials and Drug Discovery
- Shor's and Grover's Algorithms at Concept Level: What They Speed Up
- Finance Use Cases: Portfolio Optimisation, Risk Simulation and Pricing
- Logistics and Energy Use Cases: Routing, Scheduling and Grid Balancing

Day 4: Quantum Threat to Encryption and Post-Quantum Cryptography

- Harvest Now, Decrypt Later Exposure and Mosca's Theorem Timeline Test
- Public-Key Vulnerability Map: RSA, Diffie-Hellman and Elliptic Curve Dependencies
- NIST Post-Quantum Standards: FIPS 203 ML-KEM, FIPS 204 ML-DSA and FIPS 205 SLH-DSA
- Cryptographic Inventory, Crypto-Agility and Hybrid Classical-Quantum-Safe Schemes
- Post-Quantum Migration Governance: Supplier Clauses, Budget Phasing and Board Reporting

Day 5: Quantum Readiness Case Work and Roadmap

- Use-Case Screening Case: Quantum Fit Scoring for a Logistics Operator
- Encryption Exposure Case: Long-Lived Records in a Financial Services Firm
- Pilot Business Case Review: Cost, Talent and Partnership Options
- Quantum Readiness Roadmap Drafting with Horizon-Based Milestones
- Roadmap Presentation to an Executive Challenge Panel

Skills You Will Gain:

- Quantum Concept Communication
- Quantum Vendor Due Diligence
- Quantum Use-Case Screening
- Cryptographic Exposure Assessment
- Post-Quantum Migration Sponsorship
- Emerging Technology Business Case Appraisal
- Quantum Talent and Partnership Planning

Why Attend This Course:

- Return with a Quantum Readiness Roadmap that ranks use cases and sets post-quantum migration milestones for your organisation
- Challenge vendor presentations with questions on fidelity, error rates and realistic timelines
- Brief your board on encryption exposure with a clear timeline argument rather than speculation
- Compare quantum pilot experiences and migration plans with leaders from finance, energy, logistics and public services

Conclusion:

Quantum computing will reshape some problems and leave most untouched, while its threat to public-key encryption demands action well before large machines arrive. The course moves from qubits, superposition and entanglement, through hardware platforms, noise and error correction, to the algorithms and industry use cases where advantage is plausible, and then to post-quantum cryptography and migration governance. The final day applies these ideas to screening and exposure cases and produces a Quantum Readiness Roadmap participants take back to their leadership team.