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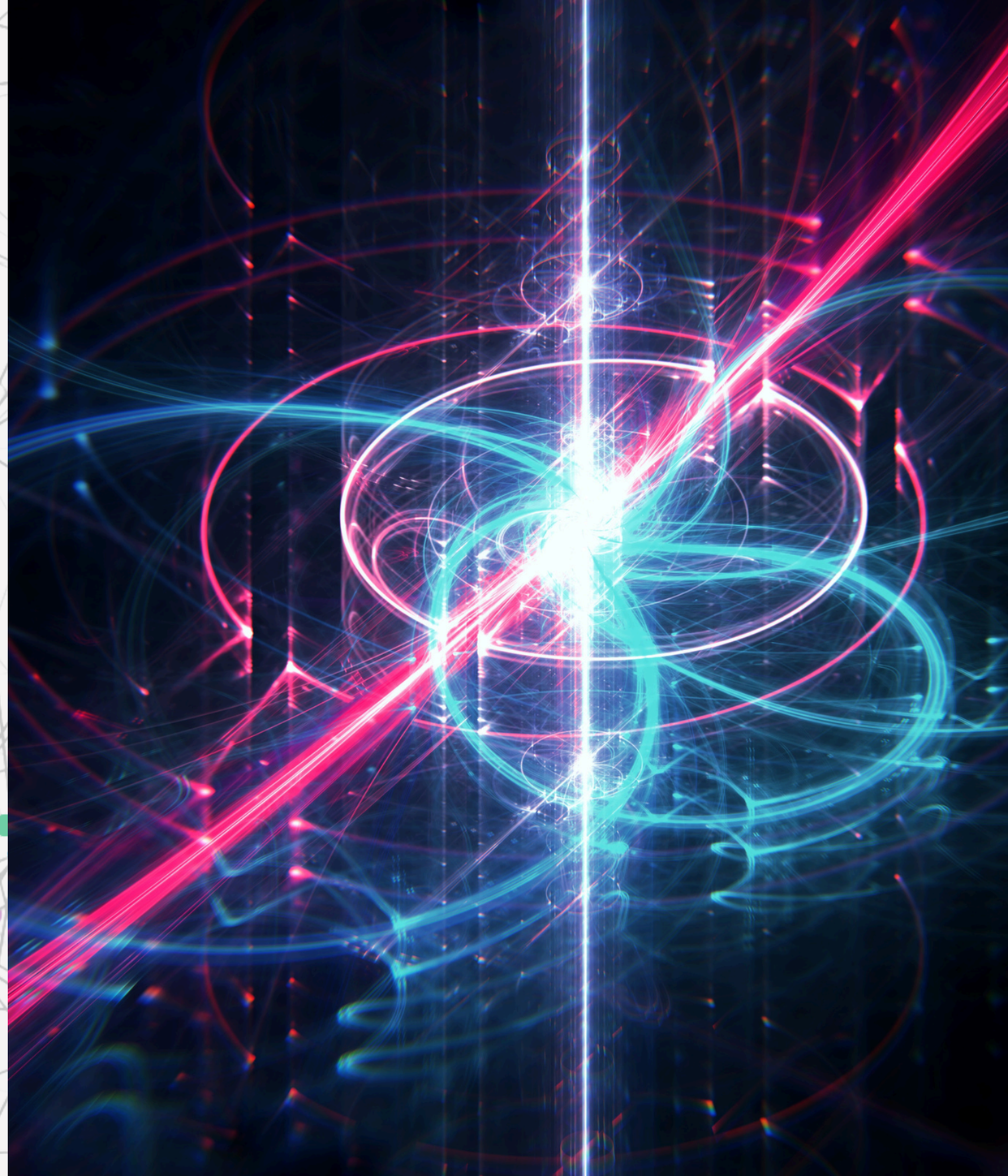
QUANTUM COMPUTING: MARKET LANDSCAPE AND TECH MAHINDRA'S POSITION



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QUANTUM COMPUTING

Quantum computing harnesses quantum mechanics principles like superposition, entanglement, and quantum interference to process information exponentially faster than classical computers.

Qubits (Quantum Bits)

Unlike classical bits, qubits exist in multiple states simultaneously, enabling parallel computations.

Quantum Systems

Capable of exploring numerous solutions at once, making them ideal for solving highly complex problems.

IMPORTANCE OF QUANTUM COMPUTING

Healthcare & Drug Discovery

Accelerates molecular simulations for drug development and personalized medicine.

Finance

Enhances portfolio optimization, risk assessment, and fraud detection.

AI & Machine Learning

Boosts deep learning capabilities and data pattern recognition.

Cybersecurity

Develops post-quantum encryption to safeguard sensitive information.

Logistics & Supply Chain

Optimizes complex route planning and inventory management.

Current State of Quantum Computing

NISQ Era

Noisy Intermediate-Scale Quantum (NISQ) computers have limited fault tolerance and are prone to errors.

Future Goal

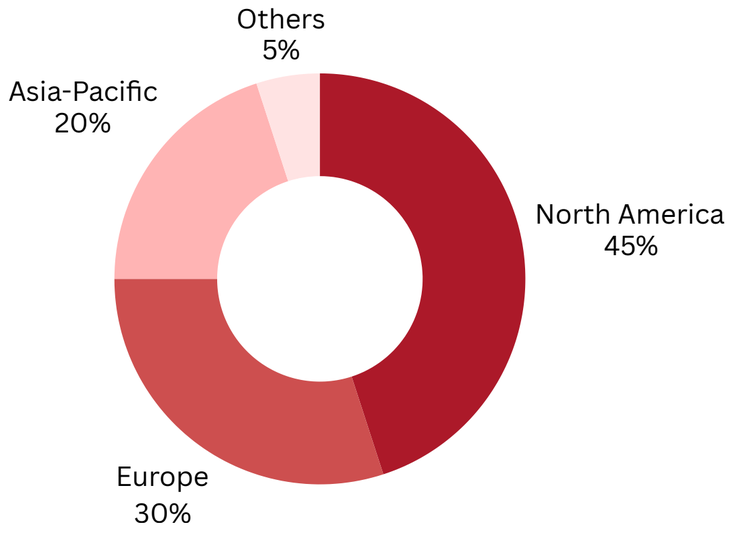
Fully fault-tolerant quantum systems are expected to be commercially viable in 5-10 years.

MARKET SIZE AND GROWTH

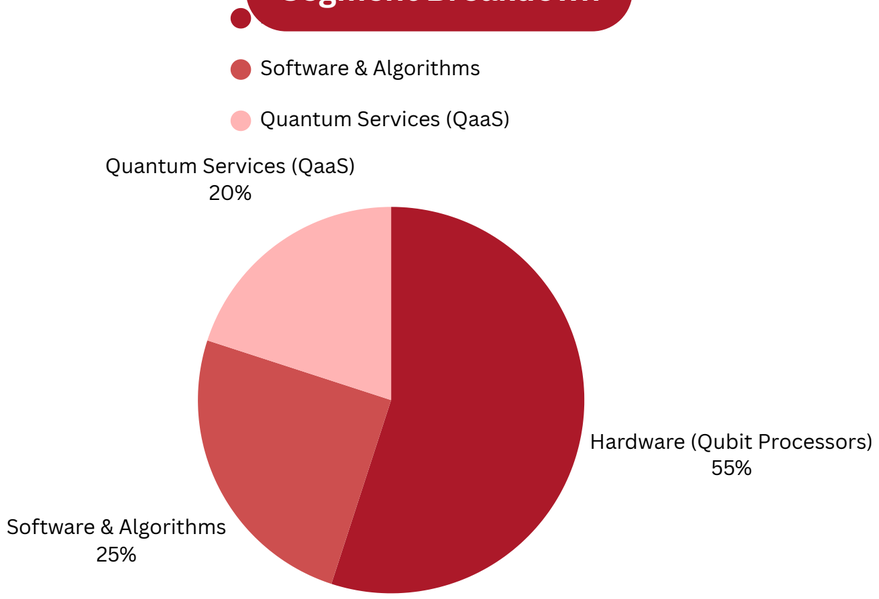
MARKET OVERVIEW

- **Market Size (2024)**: $1.3 billion
- **Projected Market (2030):** $6.5 billion to $12 billion
- **CAGR (2024-2030)**: 30%-40%
- **Long-Term Potential (2040):** Estimated economic impact of $450 billion to $850 billion

Regional Insights



Segment Breakdown



KEY GROWTH DRIVERS

Government Investments

U.S., China, and the EU are pouring billions into quantum research.

Cloud-Based Quantum Services

Access to quantum computing via AWS Braket, IBM Quantum, and Azure Quantum

Advancements in Qubit Stability

Improvements in superconducting circuits, trapped ions, and neutral atoms

CHALLENGES AND BARRIERS

Error Rates & Qubit Coherence

High susceptibility to noise and errors

High Costs

Expensive development and operational costs

Talent Shortage

Lack of skilled quantum professionals

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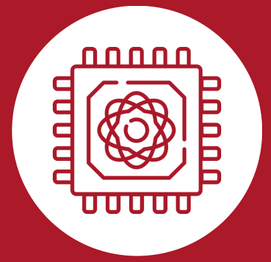
KEY MARKET TRENDS

Quantum Computing-as-a-Service (QCaaS)



Cloud-based quantum access by AWS, Microsoft, and IBM

Quantum AI & Machine Learning

Faster training of complex neural networks

Quantum-Resistant Cryptography

Development of post-quantum encryption solutions

Hybrid Quantum-Classical Computing

Integration of quantum and classical computing for practical applications

Quantum Hardware Race

IBM, Google, and Intel are scaling qubit counts and improving stability

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COMPETITOR ANALYSIS

FEATURE	IBM	GOOGLE	IONQ	PASQAL	MICROSOFT AZURE QUANTUM
STRENGTHS	Largest cloud-based quantum service, 100+ qubit roadmap	Quantum supremacy (Sycamore chip)	High qubit fidelity, trapped-ion technology	Scalable neutral atom approach	Enterprise-focused cloud quantum access
WEAKNESSES	High error rates, costly	Scalability, hardware constraints	Lower qubit count than competitors	Early-stage player	Hardware dependency
OPPORTUNITIES	Fault-tolerant systems, AI integration	Expand quantum algorithms & cloud services	Increase qubit count, enhance software	Expand Tech Mahindra partnership	Business-focused quantum applications
THREATS	Competition, talent acquisition	Technical challenges, high costs	Funding constraints	High competition	Vendor lock-in risks

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TECH MAHINDRA'S PRESENCE IN QUANTUM COMPUTING

Quantum Center of Excellence

Focused on R&D and industry-specific quantum applications

University of Auckland Partnership

Collaboration in Quantum AI & ML research

Pasqal Partnership

Development of real-world applications using neutral-atom quantum computing

Quantum Consulting Services

Helping clients explore and adopt quantum computing

Government Collaborations

Working with the Indian Government on Quantum Technology Mission

STRATEGIC RECOMMENDATIONS FOR TECH MAHINDRA

1

DEVELOP QUANTUM SOFTWARE & ALGORITHMS

Focus on financial modeling, cybersecurity, and supply chain solutions

2

EXPAND STRATEGIC PARTNERSHIPS

Collaborate with hardware leaders like IBM, Google, and IonQ

3

INVEST IN WORKFORCE DEVELOPMENT

Build quantum computing expertise through training programs

4

OFFER INDUSTRY-SPECIFIC SOLUTIONS

Target banking, pharmaceuticals, logistics, and defense sectors with quantum solutions

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KEY TAKEAWAYS

- The quantum computing market is expanding rapidly, with a projected impact exceeding $850 billion by 2040.
- Governments, tech giants, and startups are making significant investments in quantum research
- Cloud-based quantum solutions and hybrid computing models are improving accessibility.

FUTURE OUTLOOK

- Fault-tolerant quantum computers are expected within 5-10 years
- Quantum AI and cybersecurity will be major drivers of real-world adoption
- Tech Mahindra can secure a competitive edge by strengthening its quantum software and consulting services

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THANK YOU