



Entangle Qubits with Markets

Exploiting Quantum Computing in the Business World

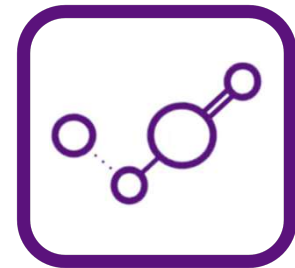
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Quantum Computing Business Solutions





Post-semiconductor Era

The end of Moore's law is a new beginning ...



Quantum Computer

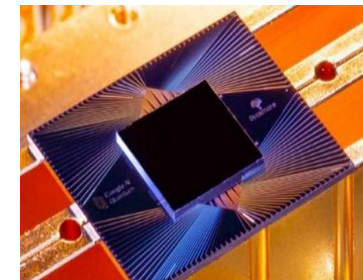
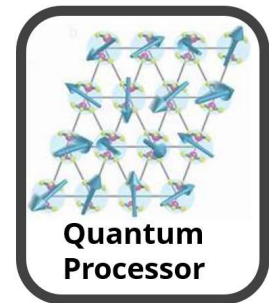
Computation by **Quantum effects**

- Superposition – parallel processing
- Entanglement – core effect for problem solving
- Tunneling – find the global minimum

The main idea is to use a quantum computer to solve a problem a *classical computer cannot*

Google Quantum Processor

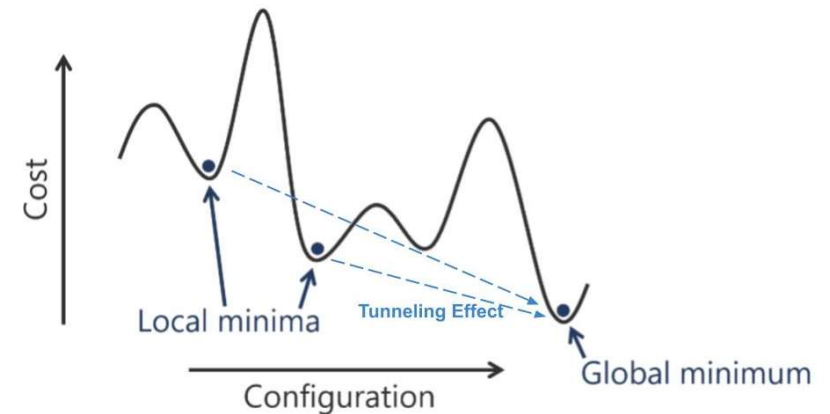
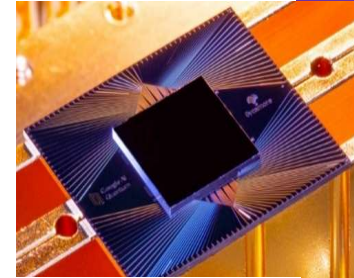
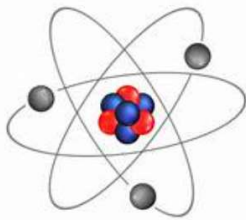
Takes about 200 seconds to solve a problem while approximately 10,000 years in state-of-the-art supercomputer



Power of Nature Computing

- **Quantum Chemistry**

- Material Design
- Drug Design



- **Optimization – Search the Best Answer**

- Lowest Energy = Optimal Solution
- Applications
 - **Finance** (Portfolio and risk management)
 - **Utilization** (Job-shop scheduling, supply chain optimization)
 - **Network Optimization** (Traffic routing, 5G/IoTs applications)

How Powerful

- **Real Case - Save on Foods (Canada)**



- Run optimization task takes from 25 hours to a mere 2 mins of calculations each week with D-wave quantum computer



- **Crack the RSA with Reversible Computing**

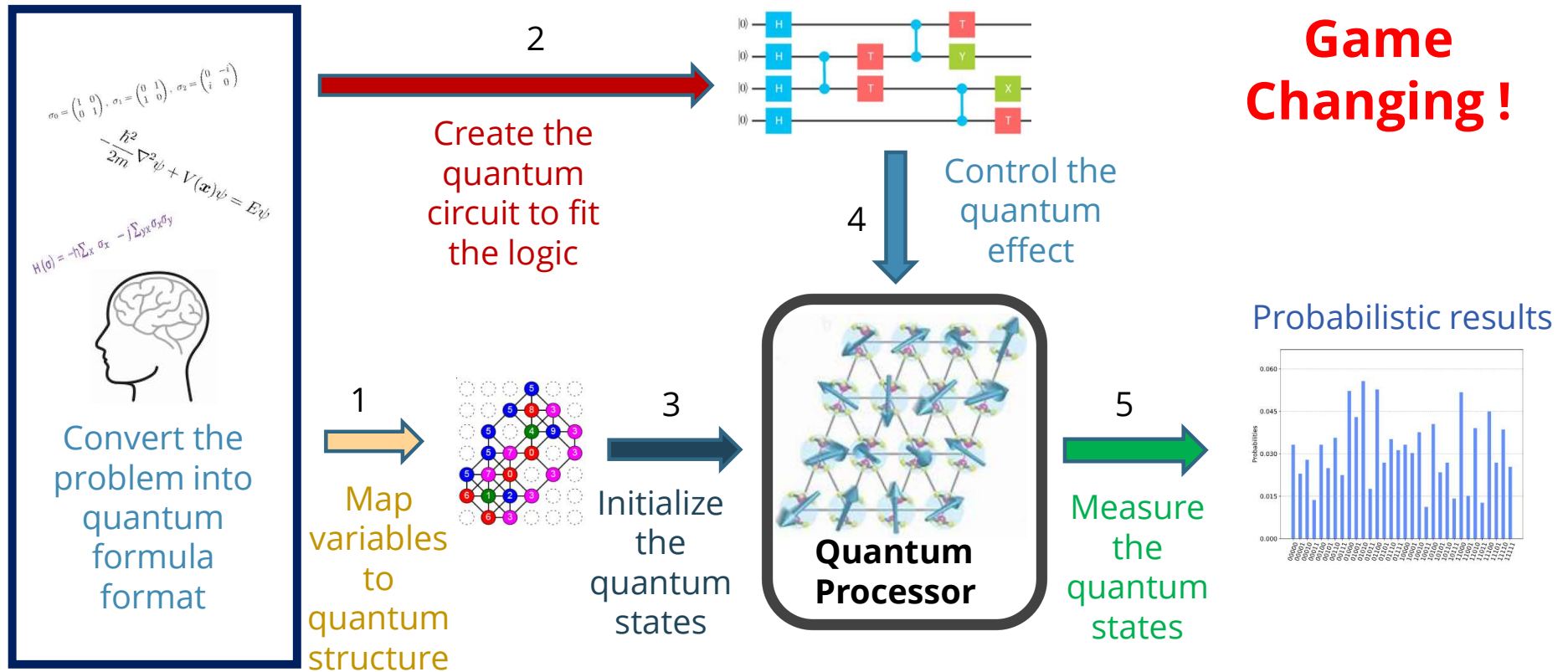
- Crack RSA within 5 minutes (estimate 10,000 qubits)
- IBM promises 1000-qubit quantum computer (a milestone) by 2023
- Can work it out ~ 2030



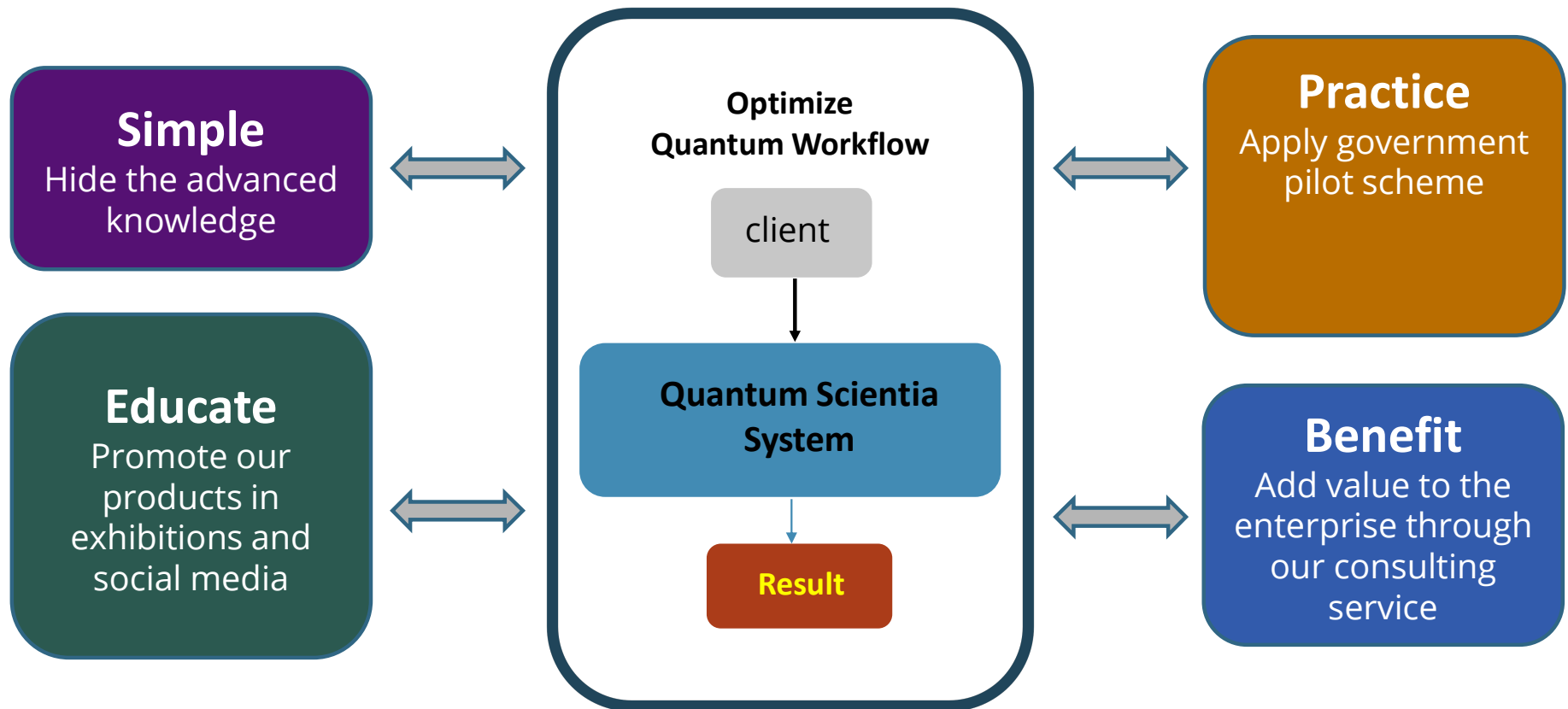
All Computer systems become INSECURE

Current Quantum Workflow

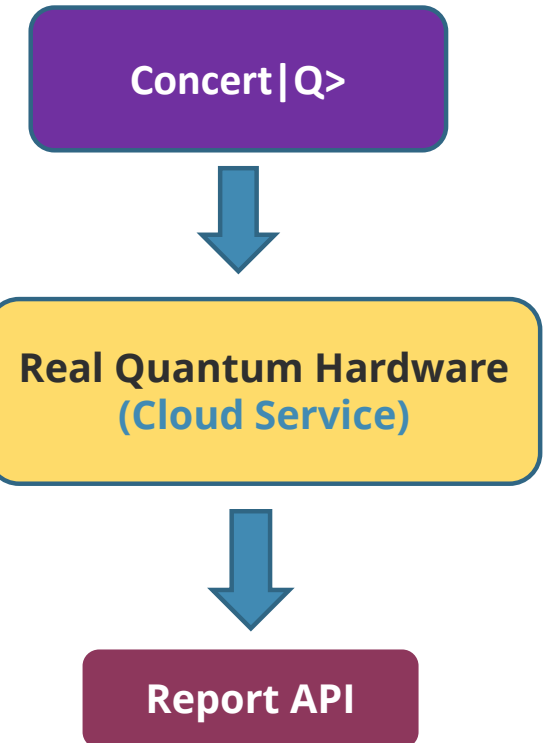
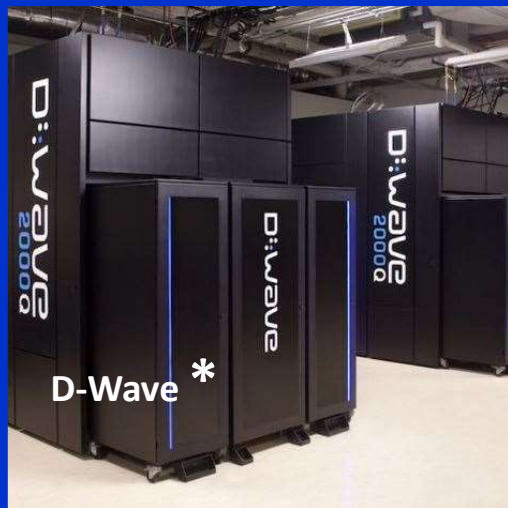
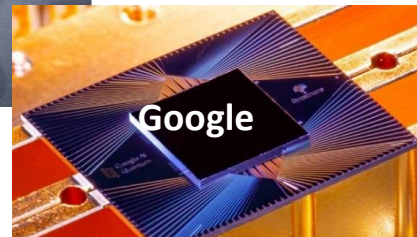
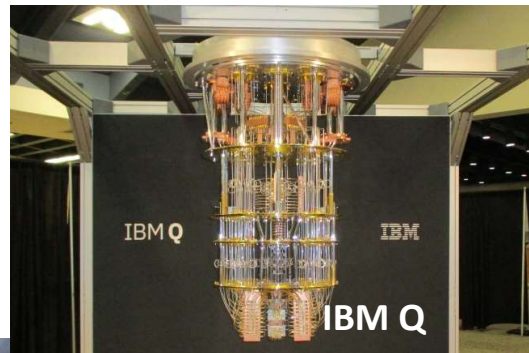
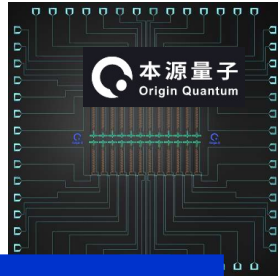
Solve the problems with **Quantum mindset**



How We Bring Quantum to Markets



Current Quantum Hardware

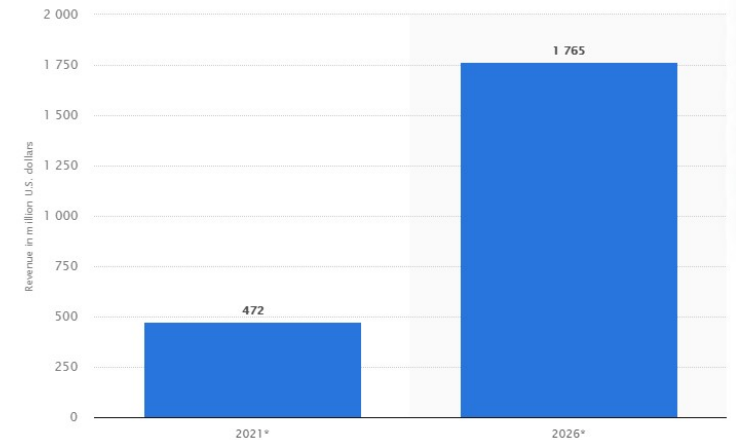


07 * D-Wave is the only Quantum Computer built for business

Market Situation

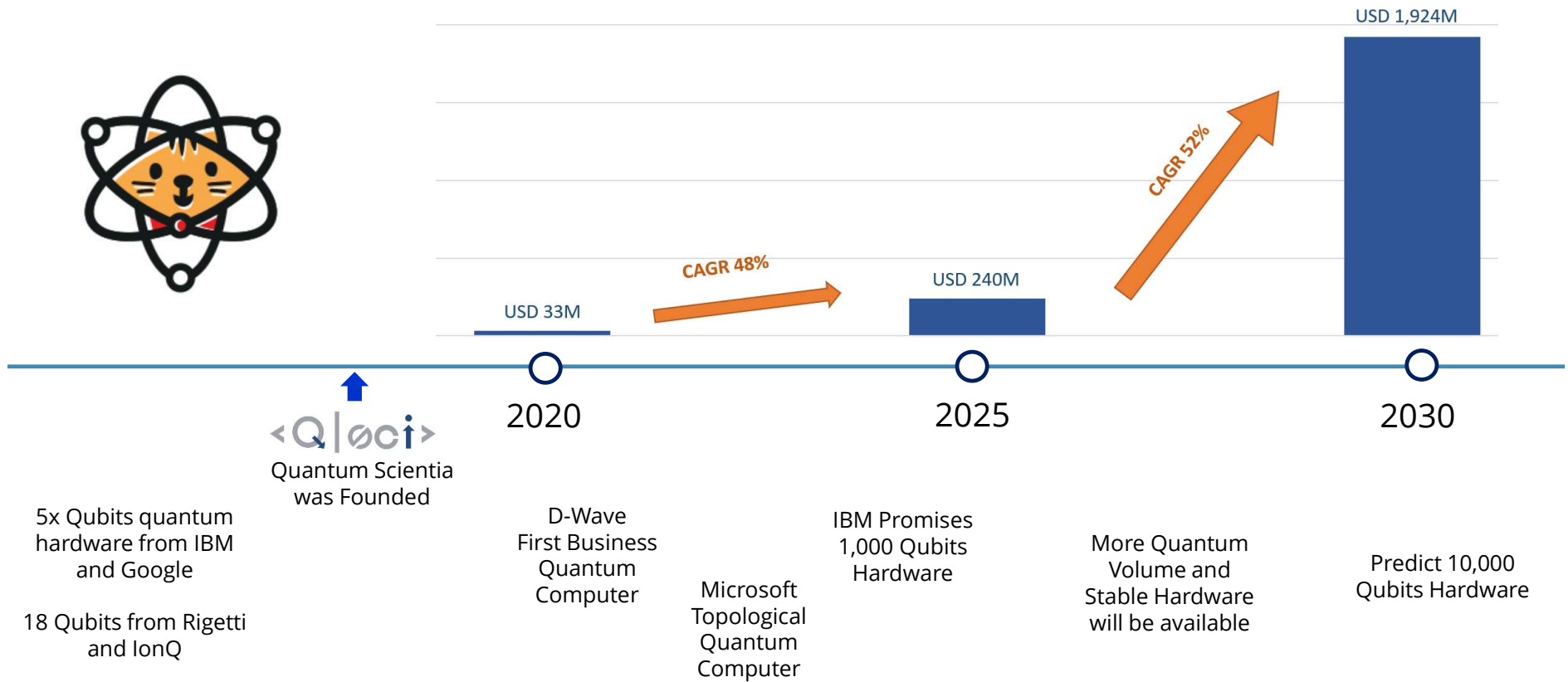
The quantum computing market is expected to grow from \$472 M in 2021 to \$1,765 M in 2026 (CAGR 30.2%)

- More commercial grade quantum hardware after 2024
- Early use of quantum computing in banking and finance industries
- Increasing investment by different governments and R&D activities related to quantum computing technology.



Hardware Build Up Leads to Software Revolution

2020-2030 Quantum Computing Market Forecast #



(#Source: Quantum Technologies 2020 report, Yole Développement)



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Conclusions

- Quantum Revolution is just over the horizon
- Prepare for the world of Quantum Computing now!