

The background of the slide features a dark, almost black, field with a series of vibrant blue, wispy, and tangled light trails on the left side. These trails resemble quantum entanglement or data flow, creating a sense of dynamic movement and complexity.

Understanding Quantum Quantum Technologies

Where we are and where we are going

A perspective from the private sector

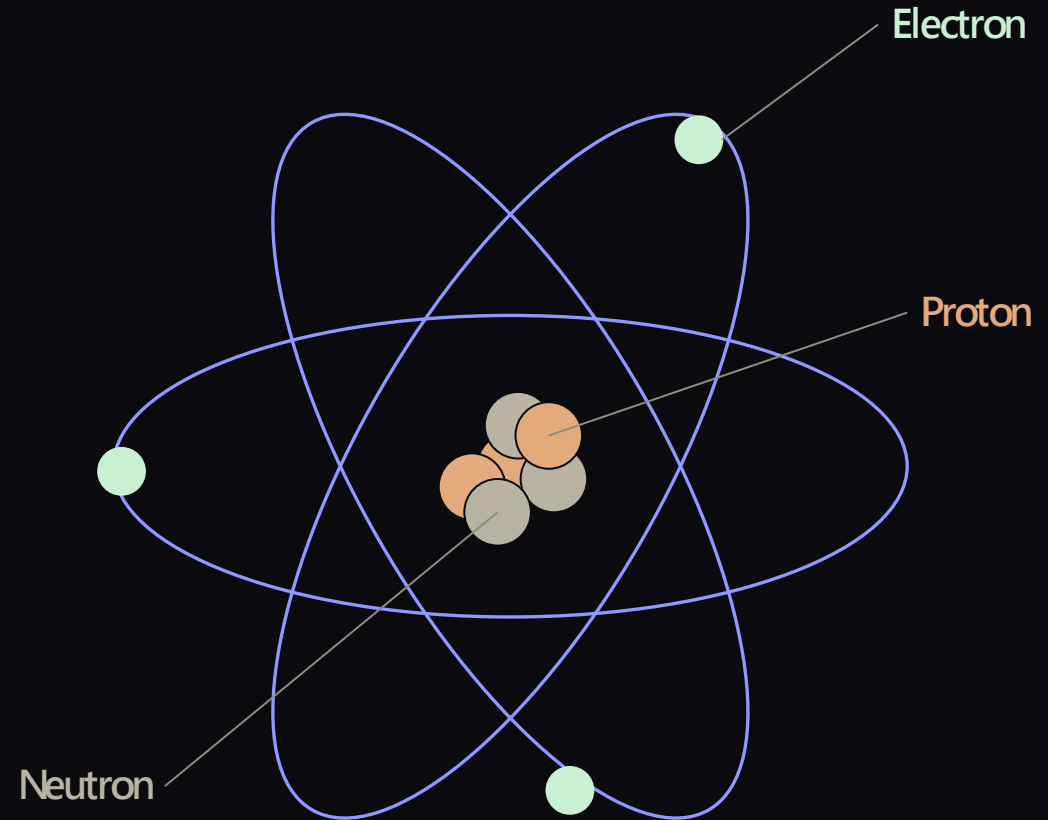
Miriam Shtilman | Tal Ventures

World Trade Organization | Geneva | 14 October 2026

THE BASICS

Quantum mechanics is the the rulebook of the **very small particle**

Atoms, electrons and ions all follow these rules.



THE BASICS

Bit vs Qubit

Bit



One state at a time

Qubit



0 and 1 at the same time

Qubit

Superposition



0 and 1

Like a spinning coin: heads and tails at the same time, until you look.

Entanglement



Linked

Like two magic coins: look at one and you instantly know the other, however far apart.

Einstein called it

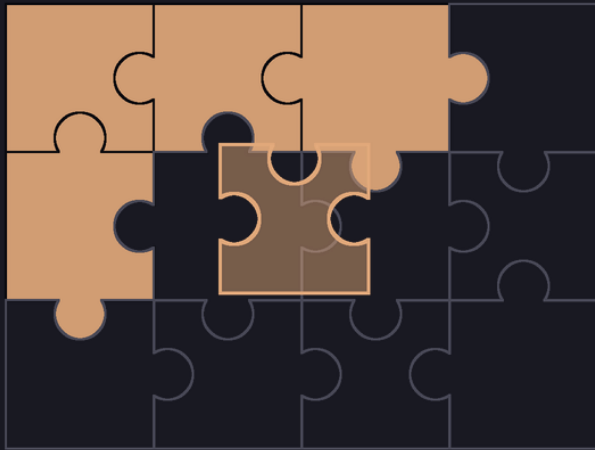
"spooky action at a distance"

THE BASICS

Solving a jigsaw puzzle.

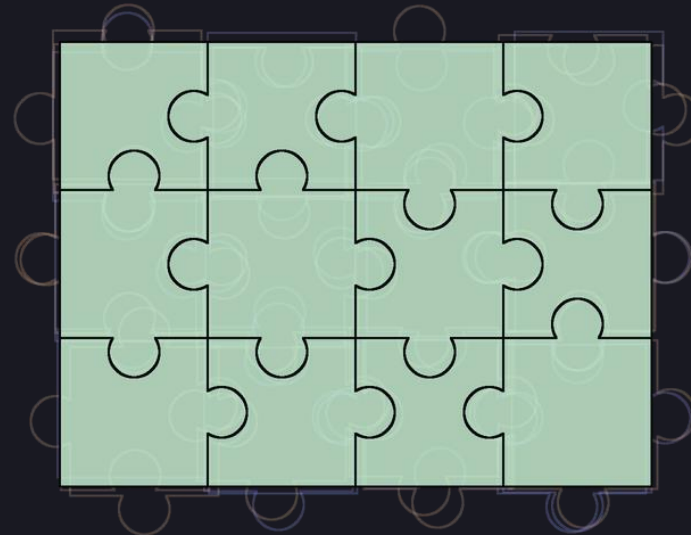
Quantum tries every piece in every spot at once.

CLASSICAL COMPUTER



One piece, one spot, one try at a time.

QUANTUM COMPUTER



All pieces, all spots, at once.

You already use quantum technology every day



MRI scanners

A strong magnet and radio waves make the hydrogen atoms in the body send out signals, thanks to a quantum property called "spin," and these signals are turned into images.



GPS

Measuring time with atomic clocks, which count how atoms jump between quantum energy levels, lets GPS satellites send signals precise enough for your phone to work out where you are.



Transistors

Controlling the flow of electrons in semiconductors like silicon

Quantum Technologies



SOLVE

Computing

protecting your payments and data, data, designing drugs and materials in materials in a fraction of the time and and cost, surpassing AI data centers' centers' capabilities with a fraction of fraction of the cost and energy consumption



PROTECT

Communication

physically secure communications and line integrity



MEASURE

Sensing

Continuity in GPS denied environments, medical diagnosis and treatment

WHERE WE ARE

Is there a working quantum computer today?

Yes

Is it useful?

Not yet, but very soon - 1-2 years out for initial applications

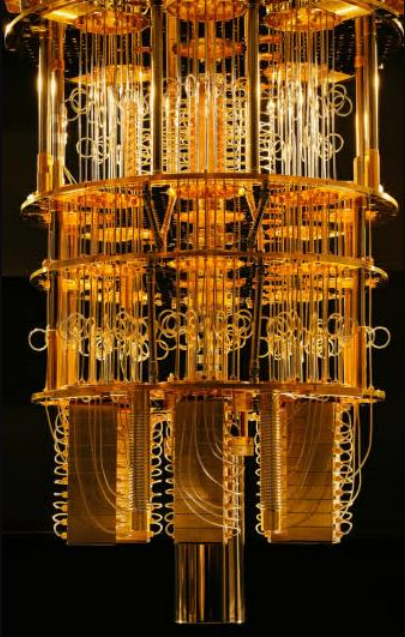
WHERE WE ARE

The technology is evolving

Quantum computers have beaten supercomputers, but mostly on tasks nobody needs yet

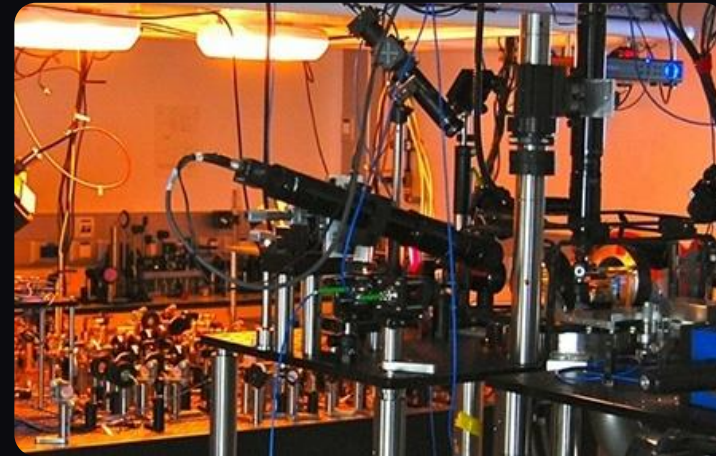
WHERE WE ARE

Do they all look like a chandelier?



The "chandelier"

A refrigerator colder than outer space keeps superconducting qubits stable



A optical table

Trapped ions, neutral atoms

WHERE WE ARE

There are several ways to build a qubit, and each has trade-offs

Approach	Examples	Strength	Challenge
Superconducting	IBM, Google	Fast operations	Needs extreme cold
Trapped ions	Quantinuum, IonQ	Very accurate	Slower, harder to scale
Photons	PsiQuantum, Xanadu	Room temperature, networks	Light is easily lost
Neutral atoms	QuEra, Pasqal	Many qubits at once	Slower operations
Topological	Microsoft	Potentially very stable	Still unproven

Almost every industry will be affected

CHEMISTRY



Pharma

Simulating molecules to design drugs



Materials

Better batteries, catalysts, fertilizer



Energy

Optimizing grids and storage

OPTIMIZATION



Finance

Risk modeling, portfolios



Logistics

Routing supply chains



Agriculture

Higher yields, fewer inputs



Water

Mapping hidden aquifers

SECURITY



Defense

Sensing and GPS-free navigation navigation



Telecom

Quantum-secure networks



Cybersecurity

Today's encryption at risk

WHAT IT CHANGES

Q-Day

A powerful quantum computer will unlock
unlock the encryption that protects us today.
today. Data stolen now can be read then.
then.

AT RISK

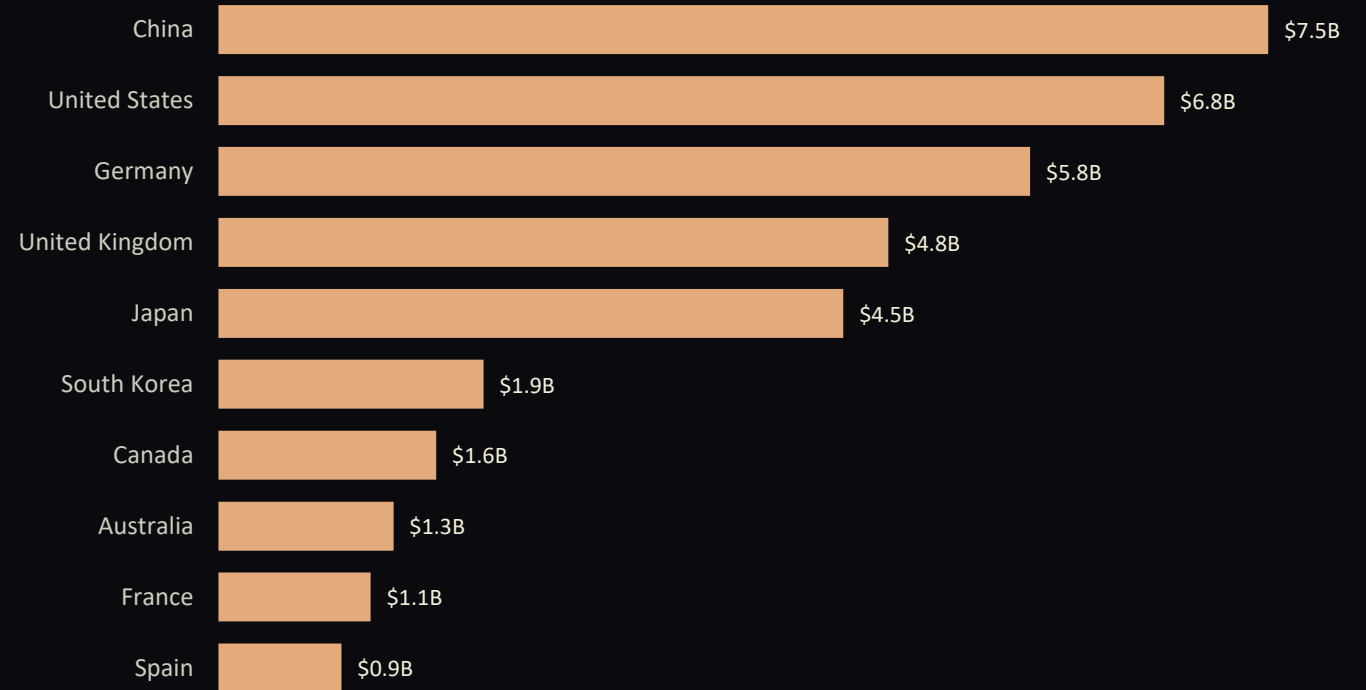
Bank transfers
Health records
State secrets
Blockchain

Harvest now, decrypt later

A government arms race: more than \$60 billion confirmed

75% comes from
just 5 counties

Top 10 countries, confirmed government funding (US\$ billions)



THE GLOBAL PICTURE

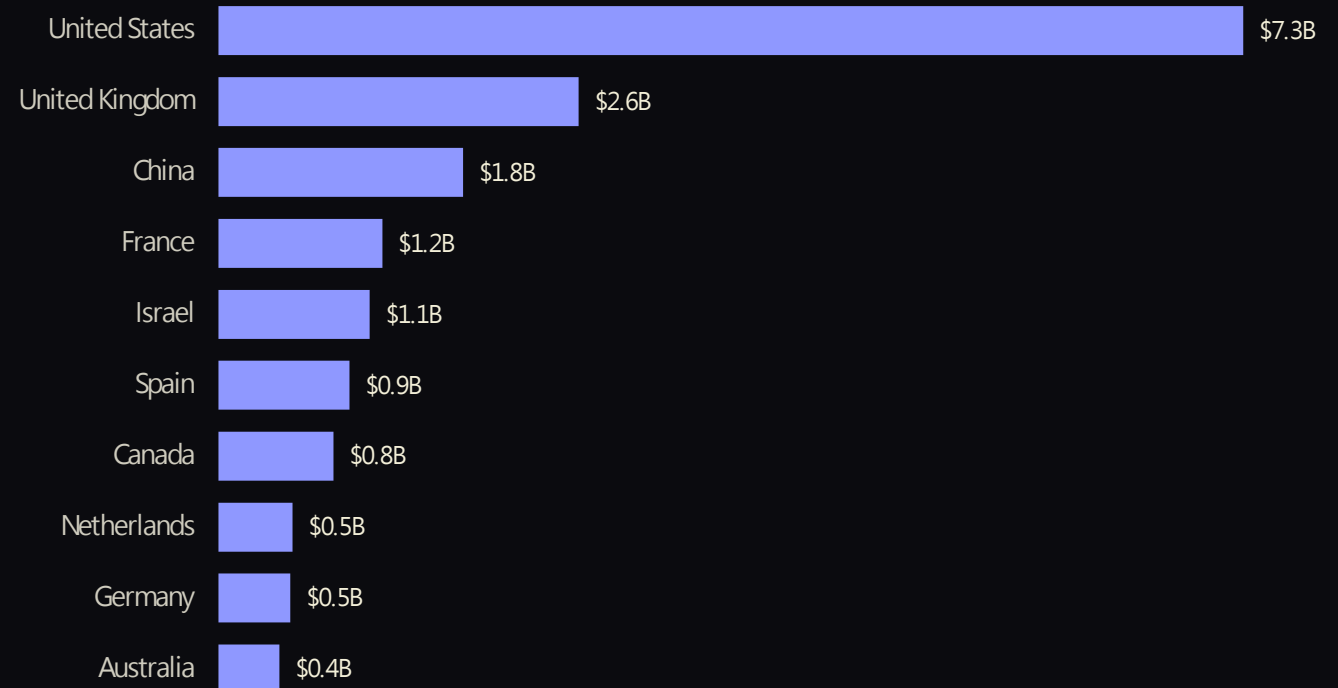
Private capital is pouring in: about \$18 billion raised

~\$18B

raised by quantum startups in the top 20 countries

~78% goes to startups in just five countries

Top 10 countries, private funding raised by startups (US\$ billions)



SPOTLIGHT: ISRAEL

Israel punches far above its weight in quantum

1 IN THE WORLD

2.7x

private capital for every \$1 of government funding

2 IN THE WORLD

\$1B+

raised by Israeli quantum startups to date

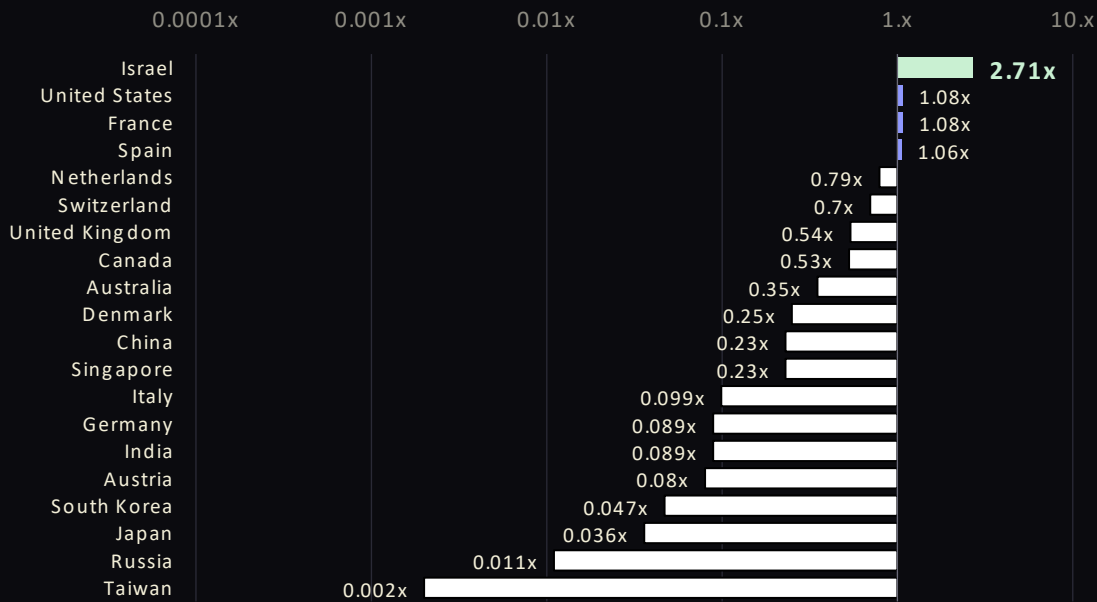


Chart: private funding as a multiple of government investment (log scale). Source: Analysis & Chart by Miriam Shtilman, based on data from The Quantum Insider, August 2026

Full-stack ecosystem

20 companies, from qubits to sensing and security

QC HARDWARE



SOFTWARE



CONTROL



SENSING AND TIMING



SECURITY



Quantum could create trillions in value by 2035

**\$1.3T to
\$2.7T**

estimated economic impact by
by 2035

Chemicals and financial services lead:
together up to \$1.4T.



Chemicals



Financial services



Optimization & logistics



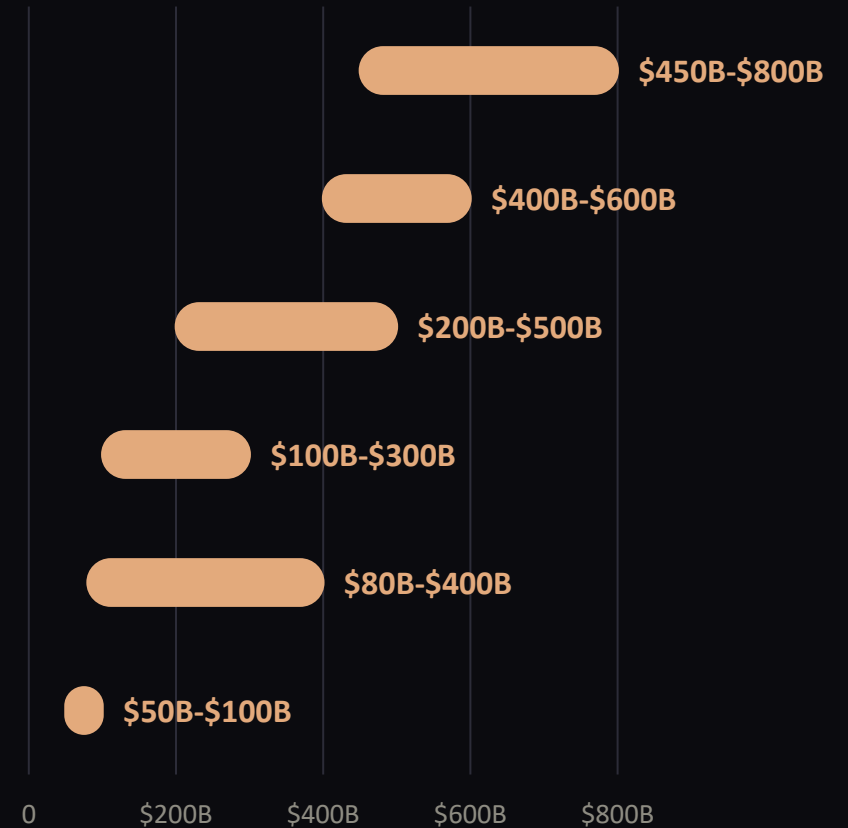
Electric power, oil & gas



Pharma & life sciences



Advanced industries, insurance,
technology, media &
telecommunications



THE GLOBAL PICTURE

The Quantum Divide

COUNTRIES

SOCIETIES

COMPANIES

Shapers

Safe

Leaders

Dependents

Exposed

Obsolete

WHAT IT LOOKS LIKE

Two-tier finance

Some banks quantum-safe,
others wide open

Two-tier healthcare

Quantum-designed medicines
medicines reach only the rich
rich

Infrastructure risk

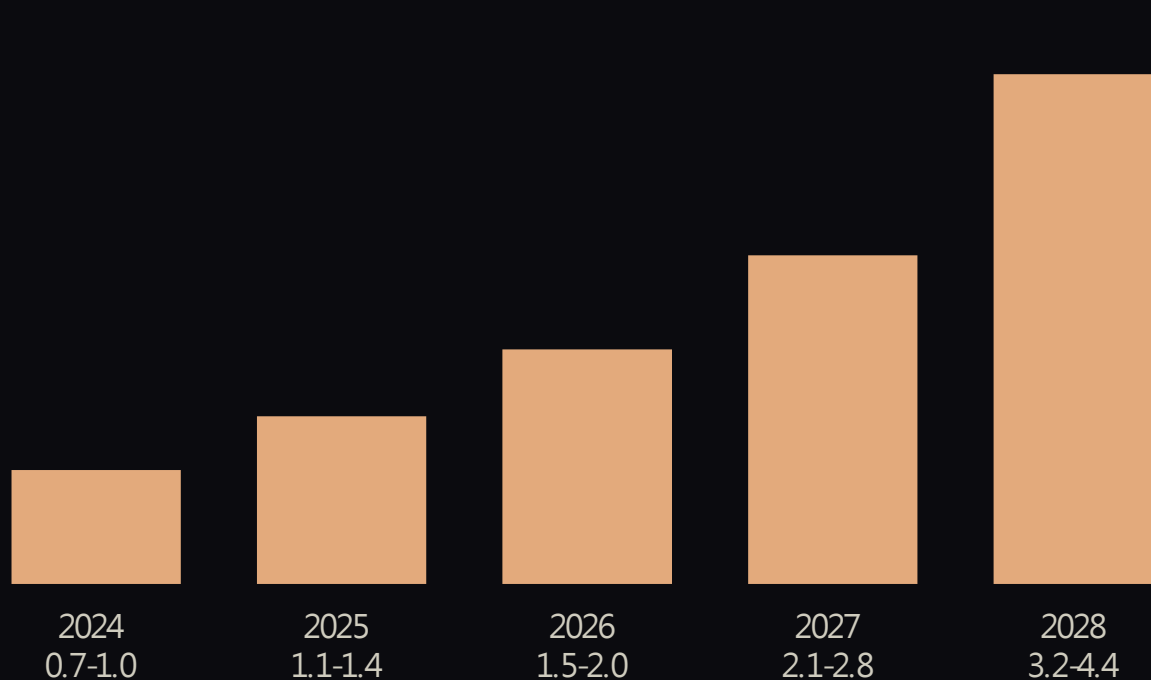
Power, water and telecoms

Big tech vs. all

A few firms own the machines
and the talent

A new market is being born, and trade data can't see it yet

Revenue of quantum computing companies, US\$ billions (estimates)



>\$1B

earned by quantum computing companies in 2025

+47%

expected yearly revenue growth, 2024-2028

\$60-100B

projected size of the quantum technology market by 2035



Most customers rent quantum computers over the cloud: a digitally delivered service.

Quantum computers depend on a handful of specialised suppliers

Parts of the supply chain McKinsey identifies as bottleneck risks



LARGEST RISK

Lasers and optics

Few specialised suppliers. Manufacturing is so specialised that newcomers struggle to enter.



Cryogenics and vacuum vacuum

The ultra-cold refrigerators rely on a small pool of suppliers, with long lead times.



Control electronics

Relatively few players make the the precision microwave equipment that controls qubits. qubits.



Rare earths

The raw material behind high-quality lasers and other quantum hardware.

The disruption: if demand jumps suddenly, for example if Q-Day comes early, these few suppliers cannot scale fast enough, and one enough, and one export restriction can stop a whole industry.

The quantum market risks splitting apart

SIGNALS OF FRAGMENTATION



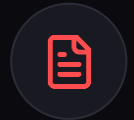
Tightening access

McKinsey expects access to cutting-edge quantum hardware to tighten as the market grows.



Restricted suppliers

A key maker of the refrigerators quantum computers need can operate only in certain geographies.



Separate standards

Different jurisdictions are developing their own quantum-safe standards, which may not work together.



IP as a strategic tool

Patents and acquisitions are used to keep competitors out, not only to innovate.

TWO PATHS FROM HERE



FRAGMENTATION BY DEFAULT

Separate markets, separate rules

Higher costs, duplicated effort, fewer countries able to take part.



OPENNESS BY DESIGN

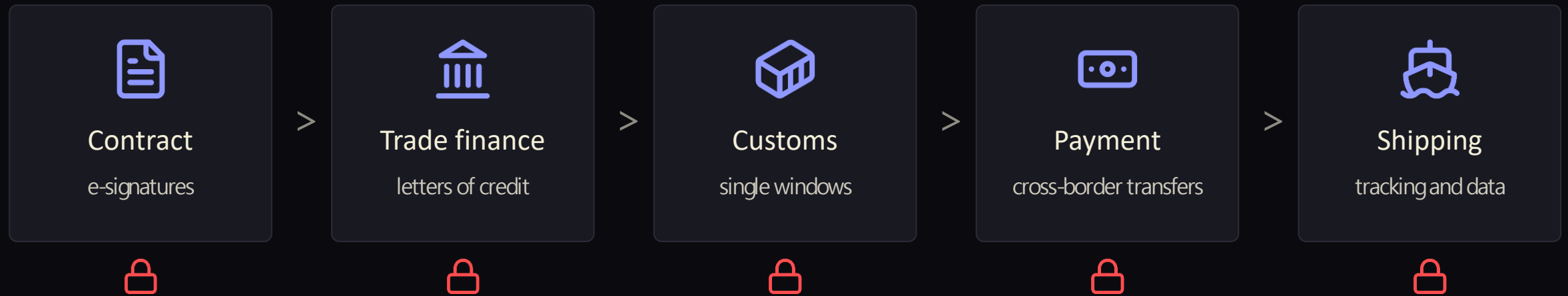
Shared rules, predictable access

Transparency and dialogue while the market is still young.

TRUST

Trade runs on trust, and trust runs on encryption

Every step of a cross-border transaction is protected by today's encryption



A powerful quantum computer could open these locks. Data stolen today can be read tomorrow.

5 years

The window in which relevant security impacts are expected

Will quantum become another technological divide?

THE KNOWLEDGE IS CONCENTRATED

~90%

of the 69,269 quantum patents filed 2000-24 come from just 11 countries

Talent

McKinsey: scarcity of quantum skills is rising, and is a top barrier for companies

6.3x

jump in start-up investment in one year, to \$12.6B in 2025: the window before winners emerge is narrowing

WAYS IN, WITHOUT BUILDING A QUANTUM COMPUTER COMPUTER



Cloud access

Rent time on quantum computers as a service



Partnerships

Aramco brought the Middle East's first industrial quantum computer, with Pasqal



New clusters

Most emerging quantum clusters are in Asia



Applications

Quantum sensing for farming and mineral mapping

KEY TAKEAWAYS

Quantum and trade: what to remember

01

Quantum is real, and it is coming soon.

Rapid acceleration in commercial use over the next 5 to 10 years, and security impacts within the next 5.

02

The market is already forming.

Investment jumped 6.3x in one year, and new goods and services are entering trade, many delivered over the cloud.

03

It will reshape trade across many industries.

An estimate of \$1.3-2.7 trillion of value at stake by 2035 in chemicals, chemicals, pharma, finance, logistics and more.

04

It is already raising trade questions.

Narrow supply chains, diverging standards for the same products, trust products, trust in digital trade, and a possible new divide.



Reach out on LinkedIn

Quantum is coming fast. The trade questions are coming with it.

Thank you | Miriam Shtilman-Lavsovski, Partner, Tal Ventures