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Quantum Computing - Creating computers with extraordinary capabilities to solve humanity's biggest problems

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Abstracts

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SUMMARY

Quantum computers are the key to the lock that prevents many of our most important technological developments being truly useful to us. For instance, with a huge data set that holds the mapping of the human genome or all the global weather patterns describing climate change, we need multiple elements to come together to make use of this information, an AI brain to ask the right questions and interpret the things we don’t have the capacity to understand and a quantum computer to perform the staggering amount of calculations needed to produce an answer. Quantum computers have the capacity to outperform traditional computers by several orders of magnitude and potentially much more as they develop. Many of the key problems that have prevented a working example being produced have now been solved and Intel, Google, Microsoft and NASA are just some of the huge organizations that are driving this technology.

KEY QUESTIONS ANSWERED

What is Quantum computing and how could it be useful?

What is the difference between quantum and conventional computing?

Who is investing heavily in this technology and why?

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SCOPE

Complete break down of what quantum computing is and the major breakthroughs that have just been made in the field.

See how the future might change once companies and governments have Quantum computing power.

Learn who is ahead in the race to build functioning quantum computers and what players are buying them.

REASONS TO BUY

Computational ability has been improving rapidly and today's chips and supercomputers have progressed rapidly since the world’s first chip from Intel was introduced in 1971. Following the pattern of Moore’s Law, which describes how the ability of chips snowballs overtime as the number of transistors increases, todays chips are dramatically better than previous generations.

Quantum computing is based on the remarkable world of sub atomic particles. Essentially particles that make up an atom act in extraordinary ways and we can use these physical properties to build computers with similarly extraordinary capabilities. The atomic world of the quantum has rules that cannot be seen anywhere else and the weirdness of this world means harnessing its effects poses very unusual challenges too.

Investments, development and research groups have been established in companies from many different industries. They all see the potential value of having quantum computers in house to help aid their particular industry and their specific market focus.

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Executive Summary
Quantum computing: using the bizarre tiny world of the quantum to solve humanity's biggest problems
Quantum computing: using the bizarre tiny world of the quantum to solve humanty's biggest problems
Classical computers are limited to strict physical laws
Physics of the quantum world is very difficult to understand let alone tame
Qubits are the fundamental “bit” of information that quantum computers use
Quantum entanglement allows qubits to be “spookily” aware of each other no matter how far apart
Quantum decoherence is the main technical difficulty that is trying to be overcome
Quantum outclasses classical by many orders of magnitude
Quantum computing is getting ready to truly take off but there are some difficult barriers to overcome
Optimization and cryptography are the main draws of Quantum ability, applicable to many industries
Optimization is one of the key uses for a quantum computer
Predicting future problems using needle in a haystack searching
The quantum world provides advanced encryption possibilities
Using quantum combined with AI technology is where the future is headed
Companies involved are wide ranging and big investments have been made
DWave computer has been criticized as not Quantum which is a setback
IBM has commercial versions being readied approaching 20 qubits
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