



Why is Silicon Valley still waiting for the next big thing?

BIG IDEAS | Today's projects are more ambitious and time-consuming

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In the fall of 2019, Google told the world it had reached “quantum supremacy.”

It was a significant scientific milestone that some compared to the first flight at Kitty Hawk. Harnessing the mysterious powers of quantum mechanics, Google had built a computer that needed only 3 minutes and 20 seconds to perform a calculation that normal computers couldn't complete in 10,000 years.

But more than two years after Google's announcement, the world is still waiting for a quantum computer that actually does something useful.

And it will most likely wait much

longer. The world is also waiting for self-driving cars, flying cars, advanced artificial intelligence and brain implants that will let you control your computing devices using nothing but your thoughts.

Silicon Valley's hype machine has long been accused of churning ahead of reality. But in recent years, the tech industry's critics have noticed that its biggest promises — the ideas that really could change the world — seem further and further on the horizon.

The great wealth generated by the

industry in recent years has generally been thanks to ideas, like the iPhone and mobile apps, that arrived years ago.

Have the big thinkers of tech lost their mojo? The answer, those big thinkers are quick to respond, is absolutely not.

But the projects they are tackling are far more difficult than building a new app or disrupting another aging industry. And if you look around, the tools that have helped you cope with almost two years of a pandemic — the home computers, the

videoconferencing services and Wi-Fi, even the technology that aided researchers in the development of vaccines — have shown the industry hasn't exactly lost a step.

“Imagine the economic impact of the pandemic had there not been the infrastructure — the hardware and the software — that allowed so many white-collar workers to work from home and so many other parts of the economy to be conducted in a digitally mediated way,” said Margaret O’Mara, a professor at the University of Washington who specializes in the

history of Silicon Valley.

As for the next big thing, the big thinkers say, give it time. Take quantum computing.

Jake Taylor, who oversaw quantum computing efforts for the White House and is now chief science officer at the quantum startup Riverlane, said building a quantum computer might be the most difficult task ever undertaken. This is a machine that defies the physics of everyday life.

A quantum computer relies on the

strange ways that some objects behave at the subatomic level or when exposed to extreme cold, like metal chilled to nearly 460 degrees below zero. If scientists merely try to read information from these quantum systems, they tend to break.

While building a quantum computer, Taylor said, “you are constantly working against the fundamental tendency of nature.”

The most important tech advances of the past few decades – the microchip, the internet, the mouse-driven

computer, the smartphone — were not defying physics.

And they were allowed to gestate for years, even decades, inside government agencies and corporate research labs before ultimately reaching mass adoption.

“The age of mobile and cloud computing has created so many new business opportunities,”

O’Mara said. “But now there are trickier problems.”

Still, the loudest voices in Silicon Valley often discuss those trickier problems as if they were just another smartphone app. That can inflate expectations.

People who aren't experts who understand the challenges "may have been misled by the hype," said Raquel Urtasun, a University of Toronto professor who helped oversee the development of self-driving cars at Uber and is now chief executive of the self-driving startup Waabi.

Technologies like self-driving cars and artificial intelligence do not face the

same physical obstacles as quantum computing.

But just as researchers do not yet know how to build a viable quantum computer, they do not yet know how to design a car that can safely drive itself in any situation or a machine that can do anything the human brain can do.

Even a technology like augmented reality – eyeglasses that can layer digital images onto what you see in the real world – will require years of additional research and engineering

before it is perfected.

Andrew Bosworth, vice president at Meta, formerly Facebook, said that building these lightweight eyeglasses was akin to creating the first mouse-driven personal computers in the 1970s (the mouse itself was invented in 1964). Companies like Meta must design an entirely new way of using computers, before stuffing all its pieces into a tiny package.

Over the past two decades, companies like Facebook have built and deployed new technologies at a speed that never

seemed possible before.

But as Bosworth said, these were predominantly software technologies built solely with “bits” — pieces of digital information.

Building new kinds of hardware — working with physical atoms — is a far more difficult task. “As an industry, we have almost forgotten what this is like,”

Bosworth said, calling the creation of augmented reality glasses a “once-in-a-lifetime” project.

Technologists like Bosworth believe they will eventually overcome those obstacles and they are more open about how difficult it will be.

But that's not always the case.

And when an industry has seeped into every part of daily life, it can be hard to separate hand-waving from realism — especially when it is huge companies like Google and well-known personalities like Elon Musk drawing that attention.

Many in Silicon Valley believe that

hand-waving is an important part of pushing technologies into the mainstream.

The hype helps attract the money and the talent and the belief needed to build the technology.

“If the outcome is desirable — and it is technically possible — then it’s OK if we’re off by three years or five years or whatever,” said Aaron Levie, chief executive of the Silicon Valley company Box. “You want entrepreneurs to be optimistic — to have a little bit of that Steve Jobs realitydistortion field,”

which helped to persuade people to buy into his big ideas.

The hype is also a way for entrepreneurs to generate interest among the public.

Even if new technologies can be built, there is no guarantee that people and businesses will want them and adopt them and pay for them. They need coaxing. And maybe more patience than most people inside and outside the tech industry will admit.

“When we hear about a new

technology, it takes less than 10 minutes for our brains to imagine what it can do. We instantly compress all of the compounding infrastructure and innovation needed to get to that point,” Levie said. “That is the cognitive dissonance we are dealing with.”