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UNCOVER INNOVATIONS THAT MATTER

Conversations
FOR TOMORROW

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Executive Conversations

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SOFTWARE IS (STILL) EATING THE WORLD

Andreessen Horowitz (known as "a16z") is a venture capital firm that backs bold entrepreneurs building the future through technology. a16z has $33.3B in assets under management across multiple funds.

Frank Chen is an Operating Partner at US venture capital firm Andreessen Horowitz, where he works at a16z Seed Fund helping founders build, launch, and scale their companies. In addition to his work on the Seed Fund, Frank trains a16z's deal and research team, which finds and backs bold entrepreneurs building the future through technology. Frank has also worked for HP, Opsware, Oracle, and Netscape Communications.

How do you think the innovation process has evolved?

Frank Chen
Partner
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— A decade ago, Marc Andreessen wrote an op-ed in which he declared that "software is eating the world." Today, that's still true. Organizations are still undertaking digital transformations and making software an increasingly core part of how they find, win, and keep customers.

A plethora of "digital native" companies has also sprung up in the interim. Take Tesla: Tesla is the most important car company on the planet right now because they thought the car through from first principles. You can spec and buy your car online. When you get into a Tesla, you know you are in the most sophisticated self-driving vehicle in the world, with self-updating software. Tesla shows you what software makes possible when you think it through from first principles. This is equally true for Netflix, Amazon, and Apple. Digital native companies are leading the way in today's economy.

The other big driver of change has been the pandemic: it pulled forward the digital initiatives of mainstream companies, from the big box retailers down to the corner restaurants which now offer curbside pickup, online ordering, and online payments. Software is eating the world much more rapidly now.

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How do you see startup evolution in this period?

— The speed of startup creation is now higher than at any point it's been in history. Ten years ago, there might have been 3,000 seed stage companies that raised $1 million each. Now, that number is around 25,000, with an average investment size over $4 million. So, startup creation has grown in terms of both number of companies and average size of investment. It's easier than ever to get a product to market, but it's still a challenge to build a product that reaches a lot of people and build a company that can take advantage of it.

What separates startups from large companies when it comes to innovation?

— A startup is willing to fail. If you are a big company executive and you have 10 projects, and you fail on five of them, you get fired. VCs and startups have a much higher tolerance of failure – and that freedom from fear supports innovation. Innovation is ultimately about creating something from nothing. You need a failure-tolerant environment to allow people to experiment and create.

Why do you think more companies should start paying attention to the crypto economy?

— We pay a lot of attention to what top talent is doing, from the best new graduates to seasoned engineers. Around 7-10 years ago, we saw them heading toward Bitcoin and other cryptocurrencies and, since then, we've probably had four waves of price inflation and crashes, but each one of those cycles has pulled the median activity up. So, we take crypto very seriously. There are many reasons why companies should pay attention. Let me illustrate them with a couple of examples. Take Helium. Helium is the first major decentralized challenger to building a wireless network. It operates the Decentralized Machine Network, a community owned and operated computer network for IoT devices, and just launched its second network, Helium 5G. It's about building a network on the back of peer-to-peer cooperation, and crypto enables this through a token-based model.

Another good example is in understanding how Web2 works. We know that tech giants are extracting a high price for all content creators who participate in the network. So, if I'm doing a Google search, I'm the product: Google gets to monetize me. But it's my identity, my digital trail, and my search history that generate economic value. How much do I make from that? Nothing. Spruce is a great example of a service that is enabling individuals to own their own identities, rather than giving all that power to Google and Meta, who then generate the profits. Spruce allows individuals to connect to Web2 and Web3 applications and control their digital identities directly using their wallet keys, instead of through an intermediary.

How do you define the objectives of Web3?

— Web1 set out the core Internet protocols. It was mostly read-only and very democratic. Once all that infrastructure got laid, then the killer apps came in Web2. It was the era of gatekeepers such as Facebook/Google/YouTube, and they made the Internet read-write for a lot of people. In concrete terms, it meant, you could not only consume YouTube content, but also upload; not only could you do a Google search, but you could contribute by publishing a Google Doc. These killer apps dominated the landscape.

Governments are now worried that big tech has gotten too powerful, because the gatekeepers capture a disproportionate share of the value. Web3 is about taking the read-write nature of Web2 and the exciting democracy of Web1. The hypothesis is that if we give users ownership rights and they participate, then we are going to have a better place. And we'll make everybody sort of part-owners, and it will not be owned by anybody and we'll all just agree to use it. That's Web3.

"Web3 is about taking the read-write nature of Web2 and the exciting democracy of Web1."

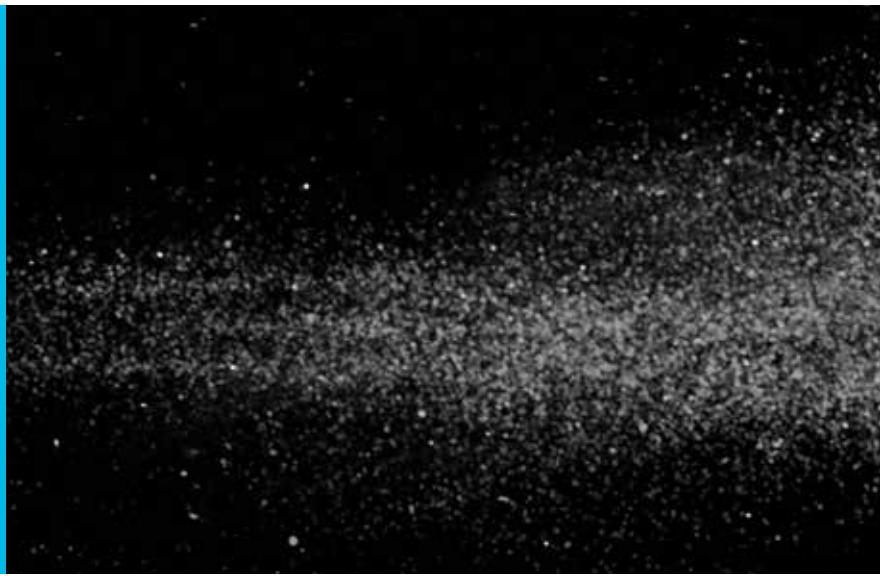
Is the metaverse the next phase of the Internet?

— To us, the metaverse is a way of saying we're going to keep on pushing the Internet along a couple of dimensions: social and immersive. Twitter/ Facebook made the Internet more social and TikTok made it more immersive. It is going to feel more and more like reality, whether you're working on a digital twin or playing in a fanciful virtual world. And the technologies that will make this real are getting there. It will continue to be decentralized and open. We will go through multiple metaverses – some owned by the gatekeepers and some built on Web3.

What are your thoughts on synthetic biology?

— Synthetic biology might be the most interesting and fundamental melding of biology and computer science. My top advice to college-age kids: do something at the intersection of biology and computer science. You could say that synthetic biology saved the world: we went straight from the DNA sequence of COVID to having vaccines. Moderna created the vaccine with a digital version of the virus, not the biological sample. We can reprogram biology to imitate existing substances, and improve on them. You can make all sorts of engineered foods, such as meat without animals. And we've also got spider-silk proteins that can make shirts stronger than Kevlar and lighter than cotton.

"We will go through multiple metaverses – some owned by the gatekeepers and some built on Web3."



To give you a real-world example, we invested in a company called Nobell Foods. The company uses synthetic biology to make a protein that's found in milk and will convince E. Coli to manufacture it at scale. It is chemically identical to protein in cow's milk. Another very interesting startup is Asimov. What if we could program biology in the same way that we program computers? Asimov is applying software concepts and many aspects of the electronic design automation (EDA) toolchain to engineer living cells. They're making the engineering of biology follow the same workflow of engineering as a computer chip.

Which new technology excites you the most?

— I see two frontier technologies. One is synthetic biology. And the other is quantum computing. It is a take on the same idea: if we can harness what nature is doing, we could benefit from it.

In this case, quantum computation is using the fundamental properties of subatomic particles to solve problems that are unsolvable by classical computers – at least in our lifetimes. If we can hitch a ride on it, who knows where it might take us.

"MY TOP ADVICE TO COLLEGE-AGE KIDS: DO SOMETHING AT THE INTERSECTION OF BIOLOGY AND COMPUTER SCIENCE."

What are your recommendations to large organizations that want to keep up with these tech developments?

— If you're at a large organization and you're trying to figure out how to be innovative, you have the traditional choice: build or buy. If you go down the build path, then you need to reward risk-taking and accept failure, which, as we have discussed, is very tough for an operating company. If you want to buy, then you must figure out what to buy and how to integrate it to enhance innovation, while hanging on to your existing talent.

There's a lot of ways to do this unsuccessfully. If you're committed to this path, then my advice is – please don't love your acquisitions to death. You have to understand what you are actually getting. Are you getting a product? Or a technology? Or a route to market? You have to recognize which stage you are at and nurture the acquisition accordingly.

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