# McKinsey
# Quarterly

# 'Find the smartest technologist in the company and make them CEO'

In the first episode of the new *The Quarterly Interview: Provocations to Ponder* series, Silicon Valley's Marc Andreessen tackles tech trends like artificial intelligence, crypto, and Web3—and why incumbents still have a tough time competing with digital start-ups.

**Marc Andreessen arrived** in Silicon Valley 28 years ago, fresh from the University of Illinois, where he and a colleague developed NCSA Mosaic, the graphic web browser that opened the world's eyes to the potential of the internet. As an entrepreneur, Andreessen launched Netscape, whose IPO was the bellwether event of the first internet boom, and Opsware, an early cloud and software-as-a-service (SaaS) company. He then cofounded Andreessen Horowitz with Ben Horowitz, building it into one of the world's premiere venture capital firms.

Andreessen's experience gives him a unique perspective on how new technologies develop, disrupt, and create opportunities for business. It's a perspective that is of particular interest at a time like this, when so much is unclear about the future of technology. Andreessen recently joined McKinsey senior partner Tracy Francis and the *Quarterly* editorial director Rick Tetzeli for a wide-ranging discussion. An edited version of the conversation follows.

**Rick Tetzeli:** *This seems like a confusing moment in terms of technology. It's been 15 years since the introduction of the iPhone, which defined a new era. But it's unclear what's coming next. Do you think we are in a transition? And if so, what should companies be doing when things seem this undefined?*

**Marc Andreessen:** The framework that we use was defined by my partner, Chris Dixon, a while back. We think about it like this: at any given time in the tech industry, there are two primary modes.

One is what we call search mode. You are wandering around through unfamiliar territory, and you're searching for new hills to climb. You're searching for new technologies that will work and that will capture the imagination. People will become interested, and new markets will open up.

The second is hill-climbing mode, which is basically when you exploit the new opportunity

or market. As you climb the hill, you refine the products and proliferate them to a mass market. Of course, every market has its "S curve" of adoption, but it might take a long time to top out, and the plateau might be really big. Smartphones are plateauing, but they're plateauing at a run rate of hundreds of millions of units a year and billions of users. That's turned out to be a really big hill. At any point in time, there are companies in both modes.

As context for now, it's useful to think about where we were around the global financial crisis, around 2007, 2008, 2009. It was a really strange time. It felt like everything might be collapsing. There was a financial crisis, a consumer recession, a giant pullback in funding. People worried that this was 2000 all over again, and the press was tripping all over itself to call this "Bubble 2.0."

But it turned out that this was a point when we had just discovered a bunch of new hills. There were smartphones. There was mobile broadband. Residential broadband hit critical mass. Web 2.0 and social networking hit, with Facebook and Twitter hitting critical mass. And it was also the rise of SAAS. It turns out that five or six of the hills [had been found], and companies started climbing them. It was actually a very magical time, and these giant booms were in the process of forming.

**Tracy Francis:** *So you think hills are being formed right now?*

**Marc Andreessen:** I do. Some of the hills that we've discovered over the past 15 years are still being climbed. But we're also in search mode. And we think the search has turned up three extremely promising new hills, which, conveniently, line up in the acronym ABC.

Artificial intelligence [AI] is the A. There are all these amazing technologies around deep learning, machine learning, GPT-3 [generative pretrained transformer 3], DALL-E, this new, image-generation thing from open AI, and so forth.

Biotech is the B, with genomics and now the mRNA revolution, and the revolution of bringing together the disciplines of biology and engineering. That's a big hill to climb.

And the third, the C, is crypto and Web3, which is a revolution around distributed consensus, building trusted networks on the internet, and all the things that follow from that.

Now, why are we confident that those are the hills to climb? If you check stock prices on any given day, it sure seems like people are less fired up about these technologies than they were six months ago.

The core thing that we do is track talent flows. And the thing that we know for sure is that the smartest people in the world, the smartest kids graduating from college, and the smartest industry professionals are flooding into those three sectors. There's an incredible wave of talent in the form of top-end engineers, scientists, executives, and founders flooding into those three sectors. In our world, that's not completely predictive, but that's as predictive as you can get.

**Rick Tetzeli:** *A lot of really, really smart people were moving into web technologies around 1998 and 1999. And a lot of those technologies wound up going nowhere.*

**Marc Andreessen:** Funny you mention that—you're exactly right! But I would add a nuance. Maybe we need the famous 2x2 matrix here [laughs].

I would break "smart people" into two sets. The ones we track primarily are engineers, right? And the nature of engineers, in any given field, is that they just go to work and write software and build gizmos. Even at moments when lots of people are disillusioned about technology, the engineers just keep showing up for work. They're engineers, it's what they do, right? So whatever the smart engineers work on is

going to get better. It may or may not be commercially successful, but it is going to improve.

This is important because when a lot of new technologies come out into the world, commentators subject them to all kinds of criticism: this new technology has all these problems! It can't possibly succeed with all these problems! A classic example was the original laptop computer. The original laptop computer was the size of a briefcase that weighed 40 pounds. And it had, like, a four-inch screen. And an early review in the *New York Times* said, basically, This is a niche product. Who on Earth is going to carry a 40-pound brick home? The guy actually wrote, "I can't imagine the average user taking one along when going fishing." They just didn't envision the engineering that would shrink it into what we have today.

We just see that pattern over and over again. Right now, it is happening with crypto, blockchain, Web3 stuff. People have all these criticisms: performance, speed, and so on—websites are devoted to listing all the things that are wrong. Engineers view such lists of criticisms as the punch list of things they need to fix. They get to work and do that.

The other set of people we focus on are the really good entrepreneurs. And yes, entrepreneurs respond to fads like anybody else. But when really good entrepreneurs pair with really good engineers, they start companies, they build products, and they tend to make what they're working on a lot better. So they too are predictive.

There's another category of smart person that I think you were referencing in your question. That's the stereotypical example of the Harvard MBA. The newly minted, elite, master of business: super talented, really knows how to tear a spreadsheet apart and rebuild it, really knows how to do brand marketing, right? Those people are complete, 100 percent heat seekers in the very best way. They jump all over whatever they think provides them the biggest opportunity.

But they can be *very* fad and trend driven. You may remember that back in the '90s, we had these two industry categories: B2C and B2B. B2C was business to consumer, and B2B was business to business. When the crash happened in 2000, we still had those terms, but they got redefined: B2C became back to consulting. B2B became back to banking [laughs].

The Harvard MBAs left for a while, at least until after the new hills were discovered—smartphones, social networking, Web 2.0, cloud [computing]. Then those people came back into tech. That's why the nerds are predictive and the MBAs aren't.

**Tracy Francis:** *Let me ask you a follow-up question, Marc. And just to be clear, I'm a Stanford MBA—not at all like those people you just insulted [laughs]. You have said many times in the past that incumbent companies are at a disadvantage versus digital start-ups. Do you still believe that?*

**Marc Andreessen:** There are two parts to this answer. One is a general theory, and the other is something that happens at a time like this, when there's a market downdraft.

There's a finite number of super-smart engineers who know what to build. These people go to the companies that take them the most seriously. They go to companies where they think leadership really understands what they do and understands how to build a first-class technology development culture. They go the places where they think they'll be appropriately rewarded but also where they'll be taken seriously, listened to, and respected. And they want to be in a place where people like themselves form a critical mass.

The problem that big, classic Fortune 500 companies have is the same problem they had 20 years ago. I thought the problem would shrink over time, but I'm not sure it has. That problem is that the true technologists inside so many big companies are not the primary people at the company. They're not treated as first-class citizens.

Just look at the org chart. For so long, companies put their technology people in the IT department. The IT department was so famously segregated and isolated that there are entire TV shows, like the great British comedy *The IT Crowd*, built around the idea of the nerds in the back room. Then, about 20 years ago, big companies got the message that maybe all their technologists should not be in the IT department. So they created what's typically known as the digital division, typically led by a vice president of digital. The good news is that the programmers run the digital division and are taken seriously there. But it's still a division. It's still a unit. That's a problem.

I'll give you an example: at Tesla, the engineers working on self-driving cars are the most important people at Tesla. Elon talks about them all the time, he talks to them all the time, and they're basically the leaders in the company. The people working on that stuff at traditional auto OEMs are not. Maybe they should be, but they're not. They're still in this kind of "back room" thing. The people who have led the business for 40 years are the same kind of people who are now in charge.

That's the pattern. Tesla is run by the technologist who envisioned the entire thing and knows every aspect of how a self-driving electric car works. The big car companies are run by people who have more classical business training, who are not inherently technologists.

The second part of my answer has to do with what happens at a time like right now, when there's a market downdraft. The minute tech stocks get hit, a lot of big companies basically say, "Oh, thank God, we don't have to take this stuff as seriously." This happened in a huge way after 2000. One of the reasons why Amazon took off is because all of the traditional retailers, after 2000, said, "Oh, thank God, we don't have to worry about this e-commerce thing anymore." And they just left the field. Borders famously outsourced their online business to Amazon, which, in retrospect, was maybe not the best idea.

This is already happening in this stock downdraft. So, Netflix stock is down 70 percent, 75 percent, 80 percent, whatever. And whereas before, you had all these stories talking about how Netflix was this permanent new, dominant Hollywood force, even a possible monopoly, now you get all these stories saying, "The Netflix model is broken, it'll never recover," with big, classic media companies saying, "Oh, thank God, this streaming thing is not going to be 'the thing' after all."

Big companies tend to come in and out of tech this way, and it disadvantages them over time. They still have such a sense of palpable relief when they think that they don't have to do this stuff anymore. Which goes to show that no matter what they say, they still aren't technology companies first and foremost.

**Rick Tetzeli:** *Let's talk about Web3 and crypto. Many people find these terms particularly oblique, and many skeptics wish that crypto would just go the heck away. So what place do crypto and Web3 have in business going forward? And what can you say to convince skeptics that this is really, really important and will change the way they do business?*

**Marc Andreessen:** There is something about crypto and Web3 that triggers responses that go way beyond, "I wish we didn't have to do this." I would describe it more as fear and loathing. Something about it triggers an extremely negative response.

Warren Buffett just had his annual meeting in Omaha, and he went on a very extensive condemnation of this entire category of technology. This is a guy who's a genius investor and a wonderful guy. He always said he's the guy who doesn't understand technology. But there's something about this technology that he feels he must condemn.

Even in the tech industry, a lot of established tech companies are just full-on, "Talk to the hand. This stuff is stupid, it's fake." It's way beyond the initial negative reaction to the internet, way beyond the initial negative reaction to almost any other area of technology. This is visceral, and I think there are two possible explanations.

One possibility, of course, is that they're right. You always have to concede that the critics may be right. There's a possibility that the future of the economy is See's Candies, not blockchain.

But maybe crypto sets people on edge because it involves money. It's so fundamental. When people think, "it's this new form of money," or "it's these new theories about money," or even, "it's this new form of technology that involves money," they get emotional. That's maybe the most obvious observation in the world: money makes people emotional.

As people who invest in contrarian ideas, that reaction gets us all excited, right? We look at the criticism as an incredible gift to our founders and to our firm. If all of these other people are going to rule something out, and if we're right that it's a big deal, then entrepreneurs who are focused on this are going to have a magic opportunity.

I think this is a foundational technology change, a new architecture for building an entirely new generation of computing systems. We have become convinced that Web3/blockchain/crypto is foundational. It's a big hill. It's as foundational an architecture shift as the ones from

mainframes to PCs, from PCs to web, from web to mobile, or from traditional software to AI. It's a fundamental shift and building this out is a 25- to 30-year process.

**Rick Tetzeli:** *I still don't see how what you just said would convince a really smart skeptic at a traditional company that this is going to be a big hill. Can you convince her that this is a new way of "building out all kinds of software?" Is that primarily what it's about?*

**Marc Andreessen:** This is about the other half of the internet that we didn't know how to build when we built the first half. When we built the first half of the internet, the whole idea was that the internet is an untrusted network, right? As an untrusted network, it's a permissionless environment where anybody can connect to it, anybody can create a website, anybody can have their computer online.

That unleashed an enormous amount of creative potential. There had been computer networks before the internet, but they had all been highly controlled and contained by the individual companies. AOL and others controlled and contained consumer networks. Your business network was provided by IBM or somebody. The internet was the first network that was untrusted, open, and permissionless, where all kinds of people could create on it. That unleashed all the excitement.

But there's a second half to this, which is that you can't rely on an untrusted network environment. If you want to do business, you must establish trust, right? You want to send somebody money, sign a contract with somebody, come together and form a business, have a concept of asset provenance and ownership that can change hands. You want all of these concepts we're used to in the real world, like identity, contract, money, title, and trust, the mechanics of a trustworthy economy. The internet doesn't have any of that. We always wanted that,

but we just didn't have the internet-native technology to do it.

The most concrete example is that there was no internet money. You go to all these websites, and if you want to pay for something, you're still punching in your credit-card number and your three-digit code, and they're still running it through the Visa mainframe, denying you for odd reasons, and charging you fees. You still can't do micropayments. Why is there advertising all over the internet? Because there are still no micropayments for content.

Blockchain/Web3/crypto is that second half of the internet. It layers trust on top of the untrusted network. And as you layer trust on top, you get to pull all of the other economic activity online that you haven't been able to get online. That's the big thing.

As to the other part of your question: How do you convince somebody? I've become convinced that the answer is, you don't. Or, at least, I don't. At this point, I don't think I've convinced anybody of anything in my life. I don't think anybody wants to be convinced. People hold onto their ideas like they're their children. They get intensely threatened if you tell them that they're wrong.

I think there are basically two times when you can get new ideas into people's heads. The classic chance is when they're young, right? You get to them before the world convinces them that something new is "not a good idea." This is why a lot of these new technology movements attract young people, just like art, culture, and even social movements. The kids are ambitious, they have nothing to lose, and they're open to new ideas.

The other moment is later in life, when some people look around and think, "Well, I don't really like the conclusions that I've reached. Maybe I was on the wrong track. Maybe there's a better way to do things. Maybe I'm at the wrong company, and I need to jump ship and try this new

thing." You see that a lot right now, people making these midcareer changes. We see it in the [Silicon] Valley, with entrepreneurs who were Web 2.0 entrepreneurs and have decided in the past couple of years to become Web3 entrepreneurs.

The point is that people need to be ready. And this goes back to the big-company thing. I do sessions all the time with big companies where I go through my whole spiel [about crypto and blockchain and Web3]. I see everybody around the conference room with their increasingly skeptical looks. They're all trying to calibrate each other. Are they going to feel like a fool if they're the one who expresses excitement when everybody else thinks it's stupid?

I assumed that by now more big companies would be more open to these new ideas. But there's something in their culture, something in the structure of how these companies are constituted. They're still not anywhere near the level that I would have assumed they would be.

**Tracy Francis:** *What do you say to these big companies, Marc? If you were to tell them how to digitally transform, what would you tell them?*

**Marc Andreessen:** Find the smartest technologist in the company and make them CEO.

I've had these conversations a thousand times with companies, with the CEO, the board of directors. They're not technologists, and I do my thing. I like people, and I like talking about this stuff. I walk them through the basics.

And I can always tell if there's a real technologist in the room. The real technologist is not sitting at the table. They're sitting against the wall. They're never in the main group, and they sit there and nod their head. They're thinking, "Finally, somebody is showing up and actually saying this to these people. Maybe they'll finally get it."

But the problem is that it's like an orchestra conductor trying to teach me how to conduct a symphony. I'd be, like, "Yeah, you wave the stick and then, I guess, the musicians play." It would take me 30 years of going back to school and learning music theory and composition and all this stuff to actually be able to do anything. But it's too late, I can't do it. This is why big companies end up with a digital department and why they have one person on the team who's a technologist.

But—and this is important—the companies that they're up against are not like that. That's not what Netflix is like. Or Amazon or Google. That's not what Tesla is like. The tech companies are run by technologists, right? They're run by the people who know how to do the thing.

**Rick Tetzeli:** *So can the incumbents compete?*

**Marc Andreessen:** Do you remember when I wrote that essay, "Why software is eating the world," about 11 years ago? The point I made was that there's a three-stage process of soft-ware eating a sector. Step one is where an existing product becomes a software product. Then comes the step where the company that builds the thing becomes a software company. And then there's the final battle, where the best software company wins.

Here's an idea that people take much too seriously: the best technology doesn't always win. There are all these case studies in busi-ness school: Betamax versus VHS, the Qwerty keyboard versus the Dvorak keyboard, Microsoft DOS versus Apple Macintosh, and so on. Example after example of, the best technology doesn't always win. And sometimes that is true. But a lot of companies and a lot of MBAs take that to mean, "We don't actually have to be good at technology. We can still win. We can market our way through."

The car companies run infinite numbers of TV commercials. Tesla has still not run its first

TV commercial. Tesla has not spent a dollar on advertising. Why? Because it's got the really-good-technology car. It's got the actual, really good product.

So, maybe the best product doesn't *always* win. But really good tech companies build really good stuff. To compete with them you have to be in the game. You need the world's best engineers. You have to have a world-leading technology culture to attract them. You need people who really know what they're talking about to make really good decisions around this stuff. So, at some point, yes, you need to put the technologist in charge. But these companies will not do it. They are no closer to doing so than they were 20 years ago. We're in some cycle of madness where they keep doing the same thing and expecting different results.

**Tracy Francis:** *Marc, switching gears here, tell us a bit about the institution that you're building at Andreessen Horowitz. In the past you've said that J.P. Morgan serves as something of a role model. Talk to us about what you as a leader are trying to accomplish within your own organization.*

**Marc Andreessen:** There's a famous story about J.P. Morgan that we always tell. J.P. Morgan, the big, glowering man, was one of [Thomas] Edison's investors. His house was the first residential installation of incandescent lighting in the US. They put lightbulbs in his library in New York, with all the priceless manuscripts and artifacts that he'd collected from all over the world. It caught on fire and almost burned the study down.

Then, to his enormous credit, J.P. hired Edison to do the lighting again. And the second time, he got the light without the heat, and it didn't burn the house down.

When people ask, "Who invented the lightbulb?" the answer, of course, is "Thomas Edison and his engineers." But who helped it become

a "thing?" Who helped it become a widely adopted thing? Who helped people understand its importance? Who helped Edison set up a company that could scale and really deliver this invention to the world? That was J.P. Morgan. I think of him as the venture capitalist for what was called the Second Industrial Revolution, 100, 120 years ago.

In history, it seems that somebody has to play that role. Somebody has to imbue credibility on a founder before everybody knows who they are. Somebody has to advance them the money when it's not at all obvious that the idea is good. Somebody has to help them get to the world. Somebody has to help them recruit and build a team before anybody knows who they are.

Ben [Horowitz] and I live in the world of these very special people who build these products, found these companies, and make these things happen. Now that we're at scale—we have on the order of 300 active portfolio companies—we're able to work this way with a large number of the best founders, and on many of the best new ideas. Our goal is to be the node in the network that is the best place for the ideas, people, money, and business to come together.

**Rick Tetzeli:** *Is it harder to scale a start-up now than when you did it with Netscape back in the mid-'90s?*

**Marc Andreessen:** It's easier in that there are a lot more people who are open to the idea of going to a start-up. When I first started, it was still pretty weird to go to a young company that might be some fly-by-night thing. People used to worry about career risk, right? "If it doesn't work out, can you go back to IBM?"

I get these occasional calls, where one of our companies is trying to hire some high-end engineer, like a Carnegie Mellon grad with a PhD in AI. His parents are worried, I'm told. So, I get on the phone with them. And he's got the offer from Microsoft Research, and he's got the offer from

McKinsey, and Goldman Sachs, all these offers from all these blue-chip companies, but he's telling them he wants to work for Whiz Bang Corporation in Cupertino, California. They say, "He's throwing his life away, right?"

But what I can tell them now is that there's no longer that same level of career risk. If things don't work out for their son or daughter at Whiz Bang, there are 800 other start-ups within walking distance that would die to hire someone with that skill set.

It's easier from that standpoint. But succeeding as a start-up is as hard as it's ever been, because the same fundamental dynamic is in play. You've got some idea of why the world should change, but the world doesn't want to. People are too busy to hear another pitch from another start-up. People are happy in their jobs and don't want to leave for your start-up. People are happy with the tech they use and don't want to buy your new product.

It's still this uphill battle, every time, to take an idea from something in a lab to something that actually matters in the world. That process doesn't seem to be getting any easier. And it probably shouldn't. The bar here should be quite high.

**Rick Tetzeli:** *One of the things that always appealed to me about the Valley was its openness to new ideas. With all its big, entrenched companies, is the Valley still as open to new ideas as it was when you arrived?*

**Marc Andreessen:** The Valley is much bigger and more sophisticated than it was. The big companies today are much, much bigger, and there are more of them. Technology is key to so many more industries, so the Valley has grown broader and wider. And now, of course, the Valley's not even just the Valley anymore. Because of the COVID experience, we finally have the ability to expand outside any single geography. There's people all over the world

who are part of the Valley, its mindset and network, without being geographically part of it. It's bigger than ever. And with that comes the fact that big areas of the industry, including a lot of the big tech companies, are quite resistant to new ideas.

Every critique I level against big companies and other industries I also level against our own companies. It's the same dynamic, the same patterns of human behavior. As things get big and successful, they tend to close down. They don't want to rock the boat. They want to keep the current thing working. So, yes, there is resistance.

**Tracy Francis:** *How do you keep that from seeping into Andreessen Horowitz?*

**Marc Andreessen:** I've learned that there are two kinds of mistakes in venture capital. There's the mistake of commission, in which you invest in or go work for a company that fails. And then there's the mistake of omission, in which you don't invest in Google or don't go to work at Facebook in 2005.

The longer you're in this industry, the more you learn that the mistakes of omission are much, much worse. You had it. It was in your hand, and you could have done it, yet you didn't do it. You weren't open enough; you found some way to talk yourself out of it. You listened to your parents.

It's funny. A lot of times, the criticisms that you paid attention to were correct. But the fact is that they just didn't matter. If you want to find something wrong with a company, you can find something wrong. But if it has enough good things going for it, the bad things don't matter. We use this phrase: invest in strength, not in lack of weakness.

A lot of people have very intelligently and rigorously talked themselves out of really good ideas. That includes us. These mistakes of

omission really get to you. With a mistake of commission, the company goes away and you don't have to hear about it anymore. But when you make the mistake of omission, you have to read about that company climbing to new heights of success for the next three decades. That's horrible, right?

The truth is that reality is trying to beat into us the idea that you need to stop being so skeptical and cynical and instead be open to new things. Because you might actually miss the next big thing walking in the door. You experience that a couple of times and it really trains you. "OK," you say, "I have to open my mind." I think that keeps the environment here a lot fresher than it might otherwise be. Q

**Marc Andreessen** is a cofounder and general partner at venture capital firm Andreessen Horowitz. **Tracy Francis** is a senior partner in McKinsey's São Paolo office, and **Rick Tetzeli,** an executive editor and editorial director of the *McKinsey Quarterly*, is based in the New York office.