NEW WORLD NEW MODELS

A CONVERSATION WITH MIT'S ANDREW MCAFEE

ONE OF THE MOST INSIGHTFUL, PRAGMATIC THINKERS ABOUT THE INTERSECTION OF TECHNOLOGY, BUSINESS AND SOCIETY LAYS OUT HIS CASE FOR THE FUTURE—AND HOW DIRECTORS SHOULD NAVIGATE THERE. **INTERVIEW BY DAN BIGMAN**

In a time of incredible technological change, dislocation—and pessimism—there are few more original or contrarian thinkers than Andrew McAfee.

Co-founder and co-director of the Initiative on the Digital Economy and a principal research scientist at the MIT Sloan School of Management, McAfee has done as much as anyone over the past decade to reshape the way businesspeople think about technology and its impact on the future. In now-classic business books such as The Second Machine Age *and* Machine, Platform, Crowd, *he outlined—with uncanny accuracy—the way new technologies would come to dominate and reshape business while offering practical advice about how to take advantage of the opportunity.*

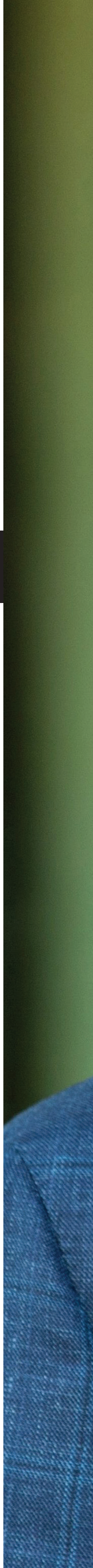
In his latest book, More from Less, *he makes a penetrating case for capitalism as a force for good and explains the critical role business is playing—and will play—in improving people's lives.* Corporate Board Member *recently talked with McAfee about why he's so bullish on the present—and the future—and where he thinks directors must focus their boardrooms right now.*

Business and capitalism are taking a real beating lately. You're making the opposite case about their effectiveness improving the human condition. What do you see there that others don't seem to be seeing right now?

Well, part of the case for capitalism is what it's always been, that it delivers us goods and services better than any other form of economic organization that we've had. Relatively few people argue with that these days. The argument, and especially the recent argument, is, yeah, but it eats up the planet whilst delivering all those goods and services to us. And we should be clear, there was a lot of truth to that argument historically.

One of the things I point out in *More from Less* is that if you look at the industrial era, which is when we really stepped on the accelerator with growth in human populations, growth in economies, when we really started to put capitalism to work around the world, fueled by really powerful technologies, you notice that as economies grew, almost without exception, they took more from the earth to fuel that growth. They took more fossil fuels, more fertilizer, more ore, more cropland. They just kind of took a bigger jump from the earth every year in order to fuel their growth.

And part of what happened, starting 50 years ago with Earth Day in the modern environmental movement, was people saying, "Gang, this can't continue." And the really deeply weird thing, and a big part of the reason that I wrote *More from Less,* is that we didn't do what was recommended 50 years ago. I'm going to oversimplify a little bit. What was recommended years ago was we have to seize control of the economy because capitalism, left to its own devices, will strip the earth bare. We can't allow this to continue.



In America, we have a really strong resistance to central planning. But if you go back and read a lot of the things written around Earth Day, there were reasonable people saying, "You might not like this. There's not really an alternative because we're just going to eat up the planet. We're going to strip it bare."

The super weird thing that happened was twofold. First, we did not centrally plan the American economy. There was no steel-rationing board, no fertilizer-allocation board set up in America or other rich countries. In fact, quite the opposite. More and more of the world started living under more and more capitalistic systems. That is true in, obviously, China, the former Soviet Union, India, Brazil—all around the world, there was more economic freedom or capitalism.

The super weird thing that happened, though, and the evidence is most clear in the richest, most technologically advanced countries, is that we actually started lightening up on the planet. What I mean by that is the trend is going downward for total American consumption, not per capita but total American consumption, of things like water for agriculture and cropland, fertilizer, lots of metals, minerals, paper and timber. The physical building blocks that you make an economy out of, we are now using less of them year after year even as our economy continues to grow.

The reason capitalism gets an unfair, bad reputation these days is we think of it as this endlessly voracious thing that will just keep taking more and more from the Earth. I simply don't think that's true anymore.

Now, I have to add one more thing, which is that there are problems that capitalism and technology, left to their own devices, do not solve. Capitalism and technology take care of resource scarcity problems. I'm really not worried about resource scarcity around the world anymore. But businesses don't take care of pollution on their own, and they don't take care of protecting vulnerable ecosystems and species on their own. We need government action for that. We need policy for that. We need an aware public for that. But if we have all four of those things, I call them the "Four Horsemen of the Optimist" in the book—tech progress, capitalism, public awareness of the problems that capitalism doesn't fix and responsive government, responsive to the will of its people—then I think that we will simultaneously improve both the human condition and the state of nature.

If you're a corporate director, where is the right place to be positioning your business for success in that environment?

One obvious thing is to be part of and accelerate the energy transition that needs to happen during the 21st century. Every reasonable person who I talk with says, "We're cooking the planet. It's us. It is somewhere between bad news and holy-cow-catastrophically bad news. And we're not doing enough to stop it." Among the reasonably smart people, there's really broad consensus on that, which is not that surprising. Fifty years ago, we weren't doing enough about other kinds of atmospheric pollution. We're not doing enough about greenhouse gases right now. Getting out in front of that is a really important, in every sense of the word, thing for businesses to do and for, I think, directors of businesses to do.

There are lots of ways to do that. I think a portfolio approach is the right one here. Whether that's becoming part of the pledge to plant a trillion trees, to become carbon neutral by a given year or to lobby for smart-energy policies, these are all things that businesses can and absolutely should be doing. I get this really strong sense that if you want to sell products, especially to younger people, if you want to hire and bring younger talent into your company and have that talent stick around, you had better not be seen as part of the cooking-the-planet problem.

You talked a little bit about the various technologies that you see shaping our age. What are they? What don't people, especially business people, often get about them and their impact?

I think we continue to underestimate the fact that we have, in the blink of an eye, interconnected all of humanity for the very first time. That's a really profound development. Most human beings throughout history grew up in profound communication isolation and information and knowledge isolation. That is simply not true anymore. I might get the numbers a bit wrong, but I think I just saw that there are 5.5 billion adult humans on Earth and 4 billion smartphones. That's a big deal.

This is a recent phenomenon, we're still exploring all of the ramifications from that. I don't pretend all the ramifications are negative. This gives bad actors a lot of leverage, absolutely. But I'm enough of an optimist about the human condition to think the good news will substantially outweigh the bad. We will get so many more contributors, creators, innovators and creative types all over the world contributing their talents to the kind of solutions that we need and becoming global customers and contributors. We're still underestimating this by a lot.

The other thing that we're still underestimating—despite all the hype we hear about it—is AI and machine learning. When I talk to the people contributing to this revolution, I just keep on hearing we're still warming up, getting started. I just saw a write-up of, I think, the first randomized, double-blind, really, really rock-solid research about whether AI can help human diagnosticians with their medical tasks. And the answer is yes, it can.

That's the first really gold-standard study in medical literature about this. How much more of that is ahead? How much more opportunity will we have to improve our logistics networks and our end efficiency or make internal combustion engines—for as long as they're around—lighter, more energy-efficient and more powerful simultaneously? We're just getting warmed up. This will unfold over several decades, not just the past several years.

Then, finally, the energy technology that I think we are underweighting and undervaluing badly is nuclear technology. Whether that's nuclear fission, which we've had for a while, or this holy grail of nuclear fusion that's out there. I would bet that's going to happen during the course of the 21st century. And living in a clean-energy-abundant world will be very different than living in the world that we live in now and better.

What if we got energy to be as cheap as computation is now? What if we could throw energy at our remaining problems, at carbon capture, at desalination, at making deserts grow, at providing higher standards of living to people?

There was this school of thought that I found really pernicious in the first wave of the environmental movement that said, "We cannot give abundant cheap energy to poor people because they will have too many children, they will overpopulate the Earth, and again, they will strip it bear with their desires." I find that morally really, really, really problematic.

I understand why people in low-income countries have a very small amount of patience for people who have already gone through the period of enriching themselves. But we should be really honest. While America was getting rich, we screwed up the environment, we committed all kinds of offenses against the Earth that we live on, and we finally became prosperous to care, to afford to care and to start to do a lot better by that. To tell the currently low-income countries that they have to immediately have the same kind of standards of care as we do, and they don't get to become rich unless they do, man, that's a problem, but let's do better than that.

There's a huge amount of conversation these days about the idea of digital transformation. It's a conversation that's finding real new urgency lately. But what is it? What are the toolmarks of a company that has been truly digitally transformed and one that's just using technology to do more stuff?

The analogy I always use here is a factory 100 years ago could electrify by ripping out the one big steam engine in the basement and replacing it with one big electric engine. That's an electrified factory because it is 100 percent powered by electricity. But that factory is not going to be in business very much longer because their competitors are going to come along, and they're going to use that same electric technology to put a motor on every machine in the factory to install overhead cranes and conveyor belts and assembly lines and to rethink what a factory could be.

When I hear companies talk about digital transformation, sometimes I get the sense that they are ripping out the one big steam engine, replacing it with one big electric motor, but that's just not gonna get the job done. So, your question is the right one, which is what does it need to more fundamentally embrace this digital transformation that we're living in?

Erik Brynjolfsson [director of the MIT Initiative on the Digital Economy] and I wrote a book about this that came out a couple years ago. There are three fundamental things that need to change. The first one is companies need to really think hard about how they divvy up all the work that needs to be done between minds and machines. That study that I mentioned earlier about medical diagnosis is a great way to do this. It's not saying to the human doctor, "You have no more role in diagnosis," but it is saying, "Do we want to have an AI engine assisting you, and does it maybe get to take the driver's seat for a lot of these things?" I would say yes.

Rethinking how we divide up all the work between minds and machines is fundamental. Most of us are way too fond of our minds. We're way too fond of human intuition, judgment, experience, expertise, gut, insight, all these things. Those are real things, but we overvalue them like crazy, especially in an era of very, very powerful artificial intelligence and machine learning.

The second thing is that a lot of companies still have a product mindset. I think a lot of very successful upstarts these days have a platform mindset. What I mean by that is they say, "Look, we're gonna build a digital environment that draws participants in. It's really compelling. It offers them value." One of my favorite examples is the difference between running a really good gym and building ClassPass, which is a platform that lets people sign up and take classes in all kinds of different gyms, and lets gyms sign up and offer their currently vacant spaces in their classes to ClassPass members.

This is a really good idea. I'm not saying it's gonna make the gym obsolete, or the brand of the gym obsolete at all, but it's changing an industry, and I think that's really really interesting.

Then the last thing that I would say is most companies are still too fond to their core, their core capabilities, their core competence, this set of things that they've built up over years that they think they're really, really good at. Insurance companies tend to think they're really good at assessing risk, and they are.

The weird part is, over and over, if you can invite the crowd in, you will find some weirdo out there who you've never heard of, or some small group of weirdos, who will take a fresh approach to your longstanding problem, and they will find a better way to, for example, assess risk than you will, despite the fact that you've been doing it and doing it well for decades and decades.

When Eric and I wrote our book, we called it *Machine, Platform, Crowd* to emphasize that the balance between minds and machines, between products and platforms, and between the core and the crowd, all those balances need to shift, and most companies, I think, are still being too conservative.

How does a corporate director begin to make that case to the CEO? How should the company begin to make these changes? They are awash in new business models and a changing world. Where do they start?

I would start to ask questions like, "What are the five most important decisions"—I'm making up the number five—"that get made in this company on a daily basis, on a strategic basis or a tactical basis? And how are we reevaluating or making those decisions in a different way? Or are we still relying on our humans to do all the diagnosis inside this company?" I would ask, "Which platform upstarts, startup companies, or which potential kinds of platform business, would be really bad news?"

That's a tough question to answer because I really doubt that anyone in the global payments industry years ago would say, "What we are terrified of are two Irish brothers, one of them 21 and one of them 19, starting a company that's gonna disrupt the global payments industry."

But that's what Stripe is doing. Because those guys started with the insight that, as they put it, if you are a new online merchant and you wanted to try something, you could set up every aspect of the business that you wanted to test, they said, as quickly as you could type, with one exception. As soon as you wanted to take a credit card from a customer, you entered, you know, 1962, and you dealt with payment and banks and credit card companies and paper forms. And they said, "First of all, we have to be missing something. This utility has to exist." And they discovered, "It actually doesn't. We have to build it up." And they spotted this big hole in the market.

Spotting that hole when you are part of the market, when you're the incumbent, is really hard to do. But I would always ask the Andy Grove question: "If only the paranoid survive, what are we likely to miss here?"

And then, finally, I would ask: "What are the ways that we're trying to involve more viewpoints, more sources of knowledge, more people in some of the important activities at this company?"

How can incumbents compete with born-digital companies that haven't had to put all their chips anywhere yet? They can come up with that singular insight, find that one weak spot.

I think that's right, but their advantage is not typically a financial advantage. A lot of the successful incumbents that I deal with have huge war chests. Their balance sheets, after a long economic expansion, are in very good shape. And the upstarts don't have the customer relationships. They're starting from nothing. What [born-digital companies] have is a very different worldview. They are not constrained by their successes and the environment that they've been brought up in. This is easy to say. It's really, really hard to do, which is why I don't have this great set of examples of successful incumbent businesses who have pivoted successfully to this new way of doing things.

I can point to a few things. I hear my colleagues and friends who work in finance saying that investing is changing pretty quickly. Some of the heavyweights of the incumbent investment world are leading this charge. Part of the reason for that is you can't convince yourself that you're still a good investor if your returns are eroding pretty steadily.

I'm a big baseball fan. I look at what some of the oldest and richest teams in baseball have been doing. The Red Sox are one of my favorite examples, a team that runs itself very differently than it did 20 years ago. Again, I think that's because it is hard to convince yourself that you're a great baseball team if you're losing games, not making the playoffs. If you see a team with one quarter of your budget and a better record than you have year after year, that tells you something. So, in the areas where we see relatively rapid, relatively clear feedback about how you're doing, that's where I see incumbents really picking up on these new approaches.

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What are some of the plays you can make in order to not get overtaken?

Obviously, you can acquire brains, you can acquire technology, but the tougher part is listening to them once you bring them in. As you know, culture is incredibly strong. Success feeds on itself. Organizational routines can get really, really deeply ingrained. Shaking things up is difficult.

I really do think that it deserves the label of leadership. Visionary leaders and their boards need to say: "Maybe it's not as clear as it is in the game of baseball that we're slipping behind some of the new competitors, but have we moneyballed ourselves? Are we clearly doing things very differently than we were 20 years ago in the face of all this technology? And if not, why not?"

What should directors and executives really be worried about when it comes to new technology you see emerging?
The main wave of technology that will change processes, companies, competition, all that, is AI and machine learning. It will change how companies do what they do. Either today's successful companies will pivot and start doing fundamental things very differently or somebody else in their industry will. Or a bunch of venture capitalists will fund a few entrepreneurs who will go after that. There are competitive moats, regulation is a really good one, but they don't last forever. So that is absolutely happening.

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One of the things that a board should always think about is: "How do we assess how exposed we are, what are the opportunities and the challenges around this wave of technology, which is as transformational as electricity was to manufacturing a century ago." But it's not just manufacturing. It goes all across the economy. That is absolutely a board-level conversation that needs to happen.

Can anyone really catch the Amazons of the world at this point? What do you see is the next big shakeup around that? Do you see anything to topple them at this point?
The tech-lash is real. I wouldn't be surprised at all if they faced a lot more regulatory scrutiny. We can talk about whether or not that's appropriate, but I think the tech-lash is real. The main thing that will trip these companies up is what always trips successful companies up: they get ossified; their radars go down, they get complacent.

The thing that I respect about this new wave the most is not that they can hire 24-year-old whiz kids and not that they have the best machine learning or economics teams. It's that their leaders seem to have read Andy Grove. They've definitely read the late, great Clay Christensen. They are more paranoid about disruption. They are more attuned to it.

Facebook is a hard company for me to defend in a lot of ways. But, man, Facebook bought WhatsApp when it was a relatively small company. They bought Instagram when it had fewer than 20 employees. And when Facebook did those things, it already had a messaging app, and you could already share photos on Facebook.

The board and the executive team could easily have convinced themselves, "We got this covered." Instead, they spent serious money to acquire those technologies not to kill them internally, but because they detected a faint signal out there that their main company, the mothership, was missing something.

When I look at Amazon's expansion, they've accrued all these very unrelated businesses. Selling me books is really not like selling cloud computing services. The only thing that explains that success is the set of principles that Amazon was founded on. Having spent some time inside the company, I can tell you, the people there walk around keenly aware of those and trying to apply those all the time. It's just an amazing example of successfully creating and maintaining a culture even as a company grows hugely.

Final question. What makes you so optimistic at a time when so many people seem increasingly pessimistic about where the world is going?
The evidence makes me optimistic. I don't think that I'm a starry-eyed optimist by personality type at all, but I try to look at evidence and go where it takes me. When I look at the evidence about most of the things that I care about—and we'll come back to the exceptions because there are really important exceptions—about how we have, in some really important ways, cleaned up our acts on the planet, that is spreading, not retreating; the environmental movement is becoming very global very quickly.

When I look at the evidence about mortality rates for almost all demographic groups, about how many people have access to clean water, at poverty rates, at school enrollment, at the things that we should care about, I walk away pretty optimistic.

When the trend is right, as I say in *More from Less*, don't yank on the steering wheel—step on the accelerator. We need to step on the accelerator with this modern world that we've created.

Now there's a big exception to that. It does appear that our economic activity is concentrating, that wealth and income are concentrating. I think our economic activity is concentrating into a small and smaller number of companies. We see more winner-take-all dynamics. It's pretty clear that lots of economies are concentrating geographically. America has these superstar cities and regions, and then a lot that are becoming left behind are more marginal.

That is a problem. Because there are people in communities in those left behind, in those marginal areas. They're feeling, with some justification, that they're not getting the deal that they signed up for. It's not because of fill-in-the-blank-with-your-favorite-demon. It's not because of the Chinese. It's not because of the Mexicans. It's not because of the other political party. It's not because of the foreigners or the welfare cheats. Or the plutocrats on Wall Street. I think it's fundamentally because our economy is going through some pretty deep changes. And those changes tend toward concentration.

What we do about that and how we bring people along for this transformation when they are in these areas, these communities that are getting left behind or that are becoming increasingly precarious or marginal, that is really important homework. We don't have a great playbook for it, I don't think. When I look at the spike in deaths of despair, it just drives home to me how important this homework is. **CBM**