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Turning scarcity into *abundance*

A conversation with
Kevin Scott
CTO and EVP of AI, Microsoft

Conversations
FOR TOMORROW

KEVIN SCOTT

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TURNING SCARCITY INTO ABUNDANCE

Kevin Scott is Microsoft's Chief Technology Officer. Prior to joining Microsoft, he was Senior Vice President of Engineering and Operations at LinkedIn. Earlier in his career, he oversaw mobile ads engineering at Google. He sits on the board of directors of Shopify; advises several Silicon Valley startups; is an emeritus member of the board of trustees of the Anita Borg Institute and a trustee of The Scott Foundation. He is also an active angel investor and founded the nonprofit organization Behind the Tech.

As a tech leader, how have you seen the sector evolve?

Kevin Scott
CTO and EVP of AI
Microsoft

The changes have been mind-boggling. I wrote my first program when I was 12 years old, and I just turned 53. The process is very different now. As a software developer, your toolset has become unbelievably powerful over the past four decades and this is reflected in the products that we're developing. And I think we're still accelerating.

We're probably going to have more change over the next 40 years due to technology than in the past 40. It is certainly the case that the capabilities for the tools will continue to increase and it creates this enormous possibility space for society to think about which problems we want to solve. Some people view technology as an unstoppable force, outside our control. While it's true that technology evolves in unexpected ways, I reject the notion that we have little agency over its outcomes. Technology, including software and AI, is a tool that we shape and decide how to use. Unlike past innovations like the printing press or steam engine, today's tools are far more accessible.

When I left academia for Silicon Valley 22 years ago, my first project was a machine learning [ML] task at Google, automating part of the ad system's backend. Despite my background in low-level systems and programming languages, I had to dive deep into research, spending six months writing complex code. Today, a high school student could complete the same task in a single morning. The democratization of these powerful tools means more people can pursue their interests, and AI is accelerating this trend.

How do you stay ahead of tech trends?

Predicting the future is challenging. Arthur C. Clarke wrote a famous set of essays in the late 1960s called *Profiles of the Future*, in which he suggested three laws. We're all familiar with the third law: "Any sufficiently advanced technology is indistinguishable from magic." However, Clarke also emphasized that we are generally terrible at predicting exactly what the future will look like. But Clarke noticed that, while we often get the details wrong, we can get the contours right if we pay attention.

> **"We're probably going to have more change over the next 40 years due to technology than in the past 40"**

With OpenAI [Microsoft's coding and AI platform, for which Scott led the investment in 2019], I've been watching the ML discipline for a long time. Having run gigantic ML projects, I understood the difficulties. Suddenly, OpenAI had a mechanism that solved some of these big, intractable problems and was scaling. It wasn't just a one-time solution; it solved a whole category of problems, with a path for scaling. Every time we turn the crank, the range of solvable problems increases. Spotting trends like this is crucial for betting on technology. A good team and access to capital are also important investor considerations.

On the flip side, you need to watch the rate of progress. For instance, blockchain excited everyone as a potential solution to many problems. However, the question that wasn't asked was, which problems would it uniquely solve? For example, people were using blockchain inappropriately, as a database or for other gratuitous solutions. It's essential to determine if a new technology solves a set of problems better than available tools. Otherwise, what's the point?

It's incredibly difficult to convince people to adopt something that isn't a real solution to a problem they have. They'll figure it out quickly, and it just won't get used. Over time, it becomes easier for people to make those calls. As a platform builder at Microsoft, we focus on building platforms that are broadly useful, even if we can't imagine all the potential uses at design stage. We need to have a bit of humility and trust the judgment of those adopting our tools to find interesting applications. It's crucial to pay close attention to the utility cycle.

IT'S ESSENTIAL TO DETERMINE IF A NEW TECHNOLOGY SOLVES A SET OF PROBLEMS BETTER THAN AVAILABLE TOOLS. OTHERWISE, WHAT'S THE POINT?

How is AI impacting software development?

The rate of adoption of AI technology is dramatically changing data center infrastructure. I predicted that the demand for AI model inference would become a core aspect of application development. The capital invested in supporting inference is soon going to dwarf other investments.

> **AI tools offer the possibility of making software engineering less zero-sum"**

When there's a big shift in workloads on top of infrastructure, you need to reimagine everything from first principles. This is a common pattern in software development. Initially, you build new emerging technologies on existing infrastructure because there's no other way to bootstrap it. But once it starts taking off, you face a massive optimization problem to purpose-build everything around the new dominant pattern.

The nature of software engineering is changing dramatically. We are using AI to perform increasingly complex software development tasks, which is beneficial even for a company like Microsoft, one of the largest software engineering companies on the planet. Despite our resources, we never have enough engineering capacity to do all the work we need to, turning software development into an excruciating zero-sum game that involves constant trade-offs.

AI tools offer the possibility of making software engineering less zero-sum. For example, inside Microsoft Research, we have a group of researchers whose mission is to eliminate technical debt at scale using AI tools. Technical debt is hard to avoid and accumulates like real debt, with interest payments that must be addressed, or else it can lead to significant trouble. Using AI to tackle technical debt is transformative and changes the dynamics of running an engineering organization.

What are your views on agentic AI?

It's exciting. At the highest level, the thing I've been hoping for my entire life is about to happen. Since Ada Lovelace wrote her first program 200 years ago, if you want to access technology, you have needed to either be a programmer, with an understanding of machine complexity and translating human problems into machine-solvable forms, or depending on programmers to anticipate needs and package code into applications.

"We are using AI to perform increasingly complex software development tasks"

With agentic software, this paradigm is breaking. Soon, software engineering and product management won't involve conceiving and packaging applications or services and then running experiments to see if they got it right. Instead, an agent will be able to translate your needs with high fidelity and execute them. The capabilities in these apps will need to be actuatable by your agent, leading to a profound change in how software is produced and used.

Sam Altman [CEO of OpenAI] has said that first-generation agents, like those in the GPT-4 era, were good at completing five-second tasks. The current generation handles five-minute tasks and, over time, agents will be capable of longer and more complex tasks. For example, my daughter, a 10th grader doing an internship at Stanford, asked me how convolutional neural networks [CNNs] work. She was trying to build a blood oxygen saturation monitor using retinal images and needed to segment the blood vessels. I immediately thought about challenges such as insufficient data to train a CNN model. However, using deep research [an OpenAI research agent] and ChatGPT on my cell phone, I provided her with 24 citations, including medical literature, image processing algorithms, and the right open-source library. It even wrote the Python code for segmentation. What would have taken me two days in grad school was compressed into five minutes. That's where we're headed. This illustrates the growing complexity and capability of AI agents.

> **"Using AI to tackle technical debt is transformative and changes the dynamics of running an engineering organization"**

How should large organizations and employees adapt to agentic AI?

Everyone should read [LinkedIn founders, Reid Hoffman and Greg Beato's] new book, Superagency. I strongly agree with their point that the most successful employees in the future will be early and ambitious adopters of AI tools. Some people have already figured out how to be more productive by using systems to handle the most irritating parts of their jobs, freeing them up to do what they are uniquely good at. These individuals are getting hold of the tools they want and it's having a real positive impact on their productivity.

While there will be some disruption, the most successful businesses will hire great people and equip them with the best AI tools. The idea of winning purely through cost optimization by substituting human labor for AI, without reinvesting savings in the human workforce to create innovation and value, is unlikely to work. Over time, the markets will reflect this, and we will see lots of investment in people.

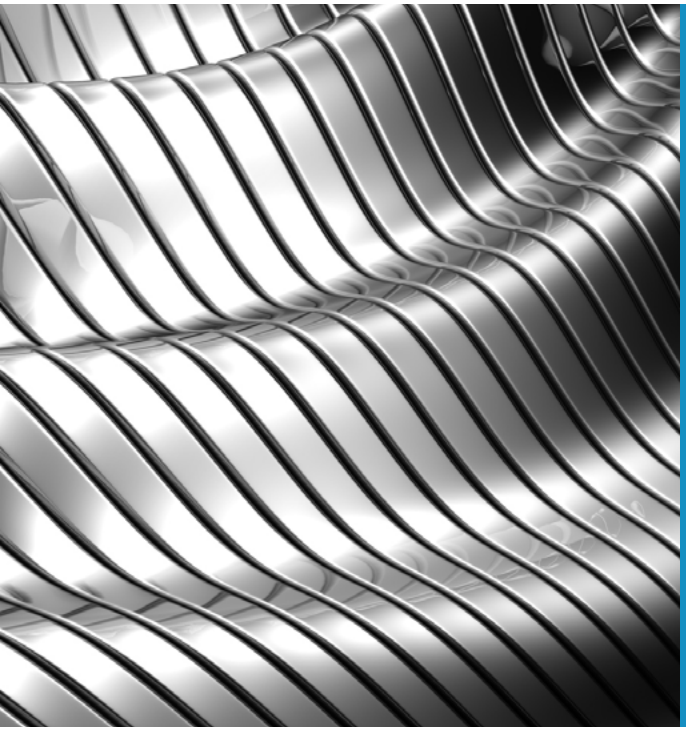
As much as I am a fan of AI, there are plenty of things it will likely never be good at. There is also a strong human preference for interacting and working with other humans, which isn't going to change.

> **"The idea of winning purely through cost optimization by substituting human labor for AI, without reinvesting savings in the human workforce to create innovation and value, is unlikely to work"**

How do we ensure AI benefits everyone?

People genuinely want to help others. I already see many people using these tools for good. Society should focus on addressing the most challenging problems we face. Often, the friction and irritation in society stem from zero-sum games, like healthcare. We have a finite capacity to deliver healthcare to a population whose demands are growing due to demographic aging. In this context, technological disruption is necessary to avoid a crisis.

Policymakers and those thinking about incentive structures should look to AI to open zero-sum areas so that there are more winners. Everyone wants high-quality, efficiently supplied healthcare that is both abundant and cheap, and AI can help us achieve that. It can also help address other challenging issues such as the need for sustainable energy, climate change, access to education, and more. There are plenty of areas where technology can turn scarcity into abundance.



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This interview has been condensed and lightly edited from the original conversation

Kevin Scott
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"There are plenty of areas where technology can turn scarcity into abundance"

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