THE FUTURE OF WORK
BOOK 4

THE NINE

THE TECTONIC FORCES RESHAPING THE WORKPLACE

BOOK EXCERPT

PHIL SIMON

Award-winning author of *Project Management in the Hybrid Workplace* and *Low-Code/No-Code*

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RACKET

Gilbert, AZ

The Nine: The Tectonic Forces Reshaping the Workplace

Racket Publishing | www.racketpublishing.com

Hardcover ISBN: 979-8-985814774
Paperback ISBN: 979-8-985814767
ebook ISBN: 979-8-985814781

Printed in the United States of America

Cover design: Luke Fletcher | www.fletcherdesigns.com
Interior design: Jessica Angerstein

Also by Phil Simon

The Future of Work

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In gratitude to Dr. Ugur Sahin and Dr. Özlem Türeci.

"For every action, there is an equal
and opposite reaction."

—NEWTON'S THIRD LAW

"Worlds are colliding."

—JASON ALEXANDER AS GEORGE COSTANZA,
SEINFELD, "THE POOL GUY"

CHAPTER 5

Generative AI

Software is getting very creative. Its effects on the workplace will be profound and irreversible.

"Plastics."

—WALTER BROOKE AS MR. MCGUIRE, *THE GRADUATE*

Few scenes from 1960s movies are as iconic in the history of American cinema as the one in Mike Nichols's 1967 film. Dustin Hoffman plays Ben Braddock, a young, disenchanted college graduate. At a party, he regularly hears the same advice from several well-intentioned elders. These sage folks have seen the future, and it's all about plastics.

If Nichols had directed that same flick in 1998, Benjamin would have repeatedly heard wildly different advice. It would be apt to

describe the last quarter-century with a single word: technology. Thanks to it, ours is a very different world. It's indisputably better in some ways and worse in others.

Still, some tech events stand out for their importance.

January 23, 1993, saw the launch of Mosaic, the web browser that gave everyday folks access to the internet. No, it wasn't the first of its kind, but it represented a giant leap forward. It popularized webpages, ecommerce, online images, and so much more.

More than five years later, Larry Page and Sergey Brin founded Google on September 4, 1998. AltaVista, Yahoo!, AlltheWeb, AskJeeves, and other search engines cratered. As of January 2022, Google accounted for more than 93 percent of the US mobile search market.[1] You know you've made it big when Webster lists variants of your company name as a verb and an adjective.

Facebook arrived on February 4, 2004. For three years, only college students could technically use the social network. By 2007, the floodgates opened, and the rest is history.

The iPhone arrived on June 29, 2007, portending the end of Nokia phones and Blackberrys. Estimates put the number of iPhones sold as of 2022 at 2.2 billion.[2]

It's still early, but these events may soon pale compared to what happened on November 30, 2022.

Unpacking ChatGPT

Just as we were finishing our Thanksgiving leftovers last year, the American artificial intelligence research laboratory OpenAI released a powerful text-generation tool called ChatGPT. Rather than define it in my own words, I'll get all meta. I'll let ChatGPT introduce itself in Figure 5.1.

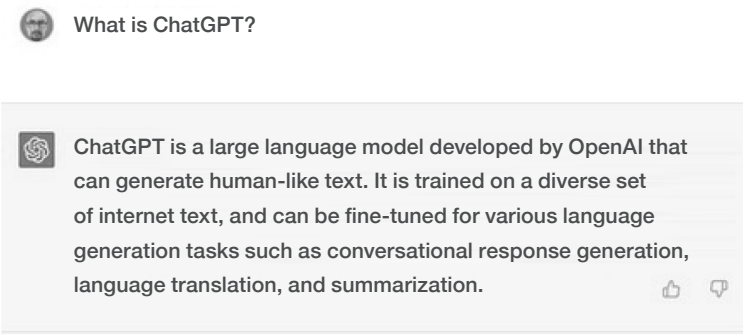

Figure 5.1: ChatGPT Defines Itself, Source: OpenAI

ChatGPT is no parlor trick or vaporware. (In case you're curious, this is the only time that I used it while writing this book.*) The sophisticated tool relies upon the latest version of OpenAI's generative pre-trained transformer, version 3.5. A full technical explanation of GPT isn't necessary here. Suffice it to say that it systematically combs through and ingests ginormous amounts of data. It then applies "a machine-learning technique that teaches computers to do what comes naturally to humans: learn by example."[3] We call this *deep learning*.

Again, there's much more to it, but machine learning is a subset of AI. And deep learning is a subset of machine learning. A helpful analogy is Matryoshka or Russian tea dolls, as Figure 5.2 shows on the following page.

If you haven't taken ChatGPT for a test drive yourself yet, I encourage you to do so. You'll quickly understand why its release broke the internet, as the kids say. Twitter was all in a twitter.

* For my post on the subject, see https://tinyurl.com/no-chat-for-me.

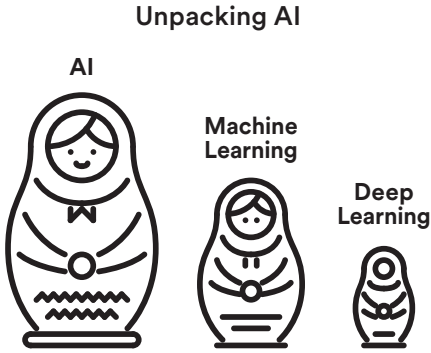

Figure 5.2: Unpacking AI

ChatGPT packed the requisite wow factor to elicit countless reactions from the cognoscenti. Derek Thompson of *The Atlantic* named ChatGPT one of his breakthroughs of 2022. In his words, "These uncanny tools, having emerged from our mind, may change our mind about how we work, how we think, and what human creativity really is."[4]

Cade Metz of the *New York Times* opined, "The Turing test used to be the gold standard for proving machine intelligence. This generation of bots is racing past it."[5]

Dharmesh Shah is the founder and CTO of HubSpot, a company that makes customer relationship management and marketing software. As he astutely observed on LinkedIn, "The Internet existed before Netscape. But the browser helped millions of mere mortals connect the dots on what could be done, and dream of what could be."

It's a valid comparison. Netscape democratized the internet, and ChatGPT is doing that with AI. Within five days of its launch, more than one million people had used it.[6] Figure 5.3 puts that figure into context.

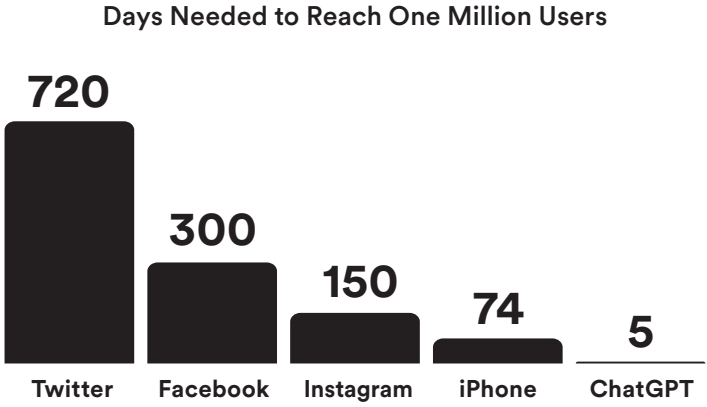

Figure 5.3: Days Needed to Reach One Million Users
Source: OpenAI

Evaluating the Hype

Is all the hype around ChatGPT *really* justified, though? Not everyone is sold.

As OpenAI CEO Sam Altman cautioned over Twitter, "It's a mistake to be relying on ChatGPT for anything important right now."[7] No argument here, but the operative words in that tweet are *right now*.

AI expert Gary Marcus echoes that sentiment. In January 2023, he appeared on *The Prof G Pod with Scott Galloway*. Marcus is the author of several books on the subject and an NYU professor.

Marcus is not nearly as buoyant on the release of ChatGPT as Thompson, Shah, and countless others. In his words, ChatGPT's backbone (version 3.5) is "not so different from a bunch of other systems that came before it,"[8] including:

- **GPT version 3:** The previous iteration that OpenAI launched to a more limited audience in June 2020.

- **Meta's Galactica AI:** Pulled by the company a whole three days after its November 2022 launch because of its obvious inaccuracies.[9]

Despite its fancy tech, Marcus wisely reminds us to remain cautious. ChatGPT is still problematic; most importantly, it can't distinguish fact from fiction. Its results sound more authoritative than they are. Much of the hype stemmed from the scale of OpenAI's 3.5 launch. Version 3 was much more limited.

Not Just Text

As we'll see in this chapter, while GPTs aren't perfect, they can already serve a number of practical business purposes. That is, they can do more than just spit out original, possibly apocryphal text in response to user prompts. ChatGPT sits under a larger group of technologies called *generative AI*. As Kevin Roose of the *New York Times* put it, it's "a wonky umbrella term for AI that doesn't just analyze existing data but creates new text, images, videos, code snippets, and more."[10]

If you're a writer, software developer, graphic designer, photographer, artist, or any other type of creative, that last sentence should give you pause. Yes, AI has been around in different forms for decades. With the launch of ChatGPT, though, AI is no longer some abstract, distant threat. Shit is starting to get real—and fast.

And lest you think that ChatGPT is a one-off project by a single rogue company, let me disabuse you of that notion. AI is a burgeoning field, and generative AI is attracting mad stacks.

Follow the Money

A decent, albeit imperfect, way to predict the future involves following the money. Ask yourself two questions:

- Where are venture capitalists placing their bets?
- How significant are those amounts?

Estimates vary, but here are a few. The Organization for Economic Cooperation and Development reported that the global annual value of VC investments in AI firms in 2020 was $75 billion. In 2012, that number was less than $3 billion.[11]

Figure 5.4 shows an even more precipitous thirty-fold, inflation-adjusted rise over a nine-year period.

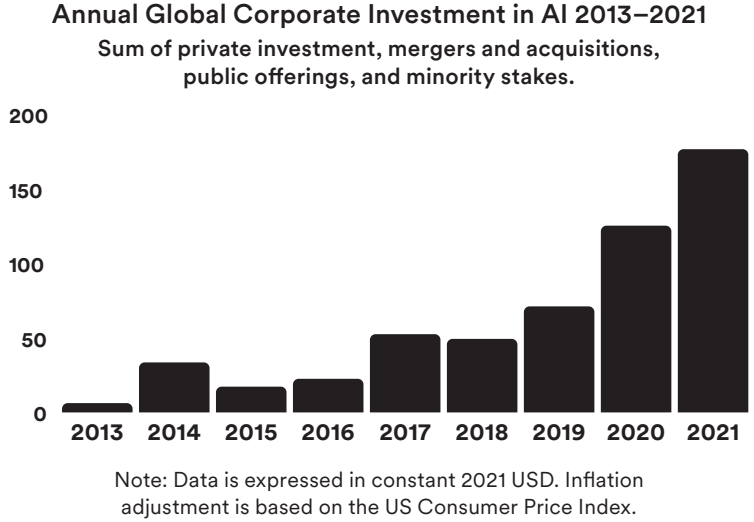

Figure 5.4: Annual Global Corporate Investment in AI 2013–2021
Source: NetBase Quid 2022 AI Index Report

Investors clearly see AI dollar signs, but what about generative AI in particular? The top dogs at the prominent VC firm Sequoia

Capital believe it "has the potential to generate trillions of dollars of economic value."[12] Pitchbook reports that VCs have increased their investment in generative AI by 425 percent since 2020 to $2.1 billion.[13] CB Insights estimates that 110 startups raised $2.6 billion in 2022.[14]

Investors want to make money. Ho hum. But what about the people who are making budgeting and spending decisions? Are they buying into the AI hype?

In short, yes.

In September 2022, the MIT Technology Review released the results of an extensive survey of CIOs and other business leaders. The topics included enterprise systems, AI, and their strategic plans. Here are some interesting findings:

> The surveyed companies' data and AI strategies are closely interlinked. Over three-quarters (78%) of the executives we surveyed—and almost all (96%) of the leader group—say that scaling AI and machine learning use cases to create business value is their top priority for enterprise data strategy over the next three years.[15]

Despite the report's stilted language, it's clear that the C-suite increasingly recognizes the vast potential of AI. As for why I suspect that, several forces are at play.

First, as we saw in Chapters 1 through 3, workers are expensive, demanding, and finicky about where they work. Beyond that, AI has matured considerably in recent years. It's become less abstract. Recent advances (such as ChatGPT) have convinced some grizzled skeptics of its capabilities, but don't believe me.

Jasper is an AI copywriting app for marketers. In October 2022, it raised $125 million, valuing the company at $1.5 billion.[16] In the words of cofounder and CEO Dave Rogenmoser, "About two years ago, we realized (AI) had crossed a threshold. It started producing better end results."[17]

And just to put a bow on OpenAI, its valuation stands at $29 billion as of this writing.[18] Expect more AI unicorns in the years ahead.

Generative AI in the Workplace

Anyone today can use a third-party tool with a conversational interface and natural language to churn out decent text. To be sure, ChatGPT is impressive, but does it represent the full extent of generative AI's power?

To quote the immortal John Bender from *Breakfast Club*: not even close, bud.

Generative AI is *already* doing much more. It serves as the backbone for standalone apps and enhances existing ones. Let's peek into its current capabilities.

Image Creation

In January 2021, the same OpenAI released DALL·E, a neural network "that creates images from text captions for a wide range of concepts expressible in natural language."[19] It works similarly to ChatGPT. Just type in a few words and let DALL·E work its magic, as Figures 5.5 and 5.6 display, respectively.

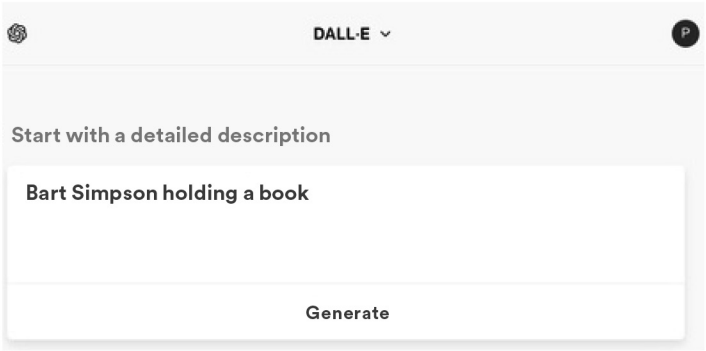

Figure 5.5: DALL·E Prompt, Source: DALL·E

A few seconds later, DALL·E returned the following:

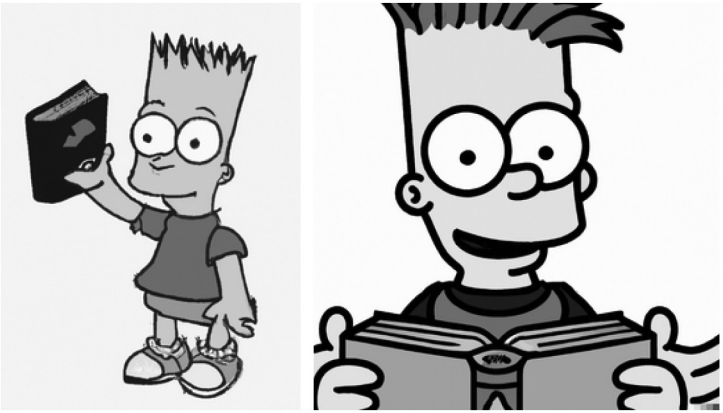

Figure 5.6: DALL·E Results, Source: DALL·E

If you don't feel like typing in words to generate images, just upload a few pics on a similar topic and chill for a few.

In July 2022, OpenAI dropped a beta of its successor, DALL·E 2. Compared to its predecessor, the second iteration generated more realistic and accurate images with four times the resolution. What's more, it "can combine concepts, attributes, and styles."[20]

Note that both DALL·E and DALL·E 2 rely upon the same GPT-3 that underpins ChatGPT. Even as OpenAI released GPT-3, it was already working hard on its successor, GPT-4 (More on this later.) Some AI experts have predicted that GPT-4 will ship with more than 100 trillion parameters—more than 500 times as many as GPT-3.[21]

Brainstorming

Professional scribes, bloggers, and social media types are using ChatGPT to counter an old foe: writer's block.

Paired Programming on Steroids

Walk by the desk of a software engineer at your organization. The odds are high that she's using an integrated development environment. Think of an IDE as a developer's Swiss army knife. It conveniently places all developer programming needs in a single, neat place.

IDEs aren't new. Mainstream ones have shipped with native autocomplete functionality for years or supported third-party plugins that did the same. They work as follows: as developers type their lines of code, autocomplete predicts the text that probably should or usually comes next. This feature does more than just save time. It minimizes errors, interprets them when they occur, and offers relatively basic real-time solutions.

Thanks to generative AI, one mainstream IDE, Visual Studio 2022, is getting much smarter. On March 29, 2022, GitHub announced Copilot. Billed as "your AI pair programmer,"* the tool

* In pair programming, Developer #1 (the driver) codes while Developer #2 (the navigator) observes, points out errors, and recommends solutions while hopefully not annoying Developer #1.

"turns natural language prompts into coding suggestions across dozens of languages.[22] Copilot can do this because its creators trained it on billions of lines of code.

Think of it as ChatGPT, but for software developers. As Dave Gershgorn described for The Verge:

> Copilot does more than just parrot back code it's seen before, according to GitHub. It instead analyzes the code you've already written and generates new matching code, including specific functions that were previously called. Examples on the project's website include automatically writing the code to import tweets, draw a scatterplot, or grab a Goodreads rating.[23]

Again, it's not perfect, but it's impressive. Most important, its functionality will improve over time. In case you're wondering, Copilot also relies on GPT-3.

Enhancing Existing Software Applications

Damn coders. Why do they get to have all the fun?

Fortunately, all nontechies will soon be able to benefit from generative AI. Depending on the current situation, you may already be able to take advantage of different generative AI features.

Notion

Notion is a flexible and popular productivity and note-taking tool. (My previous book, *Low-Code/No-Code*, describes some of its manifold uses and my unabashed love of it.) On November 16, 2022, a few days before ChatGPT's public launch, Notion announced that users could access the AI writing assistant within the app.[24] Expect Notion's competitors to add similar functionality.

Canva

For those who don't want to learn Adobe Illustrator and Photoshop, Canva is a user-friendly and affordable alternative. In November 2022, the company added text-to-image capability.[25] It works identically to the other standalone tools mentioned earlier in this chapter. Punch in a few words, and wait for Canva to generate unique images.

Canva Docs represents its foray into rich-text document creation. No, it won't kill proper desktop publishing tools like Adobe InDesign. But it will, I hope, put an end to novices' efforts to create souped-up Microsoft Word documents. To help writers get going, Canva in December 2022 introduced Magic Write, "a magic new copywriting assistant helping you get to your first draft, fast"[26] based on GPT.

Feedly

Feedly is a popular news aggregator. It allows users to consolidate, group, and search newsletters, RSS feeds,* sub Reddits, tweets, and other sources of information automatically. (When Google Reader perished in 2013, a good percentage of its passionate users flocked to Feedly.)

In January 2020, the company launched Leo, billed as "your AI research assistant."[27] Its impressive list of capabilities includes the ability to:

- Prioritize topics, trends, and keywords of interest.
- Deduplicate repetitive news.
- Mute irrelevant information.
- Summarize articles.

* An acronym for *really simple syndication*.

The items that users store in Feedly (along with their metadata) allow Leo to learn what's important to them, but it gets even better. Leo suggests content they'd otherwise have missed. Leo and similar tools can improve the scope and quality of a research or writing project while decreasing the time needed to complete it.

Microsoft

Speaking at the 2023 World Economic Forum in Davos, Switzerland, Microsoft CEO Satya Nadella said that his company would soon integrate ChatGPT and other OpenAI tools into all of its products.[28] Maybe PowerPoint will tell you in the future that your slides are too cluttered and create a better presentation for you.

More Intelligent Messages

Opaque and downright inscrutable messages from our computers' operating systems and software programs have frustrated us for years. At some point, you probably saw the "PC Load Letter" error message on your printer and wanted to go all *Office Space* on it.

Generative AI will soon go way beyond providing error messages that we can understand. It will recommend solutions and even implement them automatically. Regardless of what we say or type, AI will be able to infer what *we meant* to do.

Workplace Considerations

The American historian and history professor Melvin Kranzberg once famously opined, "Technology is neither good nor bad; nor is it neutral." As we'll see in this section, nowhere do those words ring truer than with generative AI.

Generative AI is a bit of a Rorschach test. It's not hard to find positives and negatives. Here are some of them.

Productivity

At a high level, generative AI tools may make some workers more productive—in some cases, much more. While researching this book, I came across an interesting analogy of how we'll use tools based on generative AI in the coming years.

Professional golfers walk the course but don't carry their own bags. That job falls to their caddies. These folks do more than just lug heavy bags of clubs, golf balls, snacks, umbrellas, water, and other assorted equipment. They don't just rake sand traps. Before their bosses tee off, caddies meticulously study the course before tournaments begin. While rounds are taking place, they make critical recommendations on where the golfers should aim, which club to hit, and how to read a putt.

Caddies' advice can be indispensable. A single stroke is usually the difference between making and missing the cut, among other things. For their efforts, caddies typically earn $2,000 per week plus anywhere from 5 to 10 percent of their bosses' weekly prize money.[29]

Think of generative AI tools as caddies—at least in the short term. They don't swing the clubs themselves, and they aren't infallible. Caddies' tips help pro golfers hit the best golf shot possible under the circumstances. In other words, the best caddie in and of itself means zilch. All things being equal, however, a better caddie results in a better outcome.

To complete the analogy, robots may swing the clubs themselves in the future, and the golfer may become irrelevant. We're not there yet, though. The arrival of generative AI also means that employers will *try* to get more bang for their employee buck.

Why Increased Productivity Isn't a Given

In 1987, the noted economist Robert Solow wrote in the *New York Times*, "You can see the computer age everywhere but in the productivity statistics."[30]

Thus, the Solow Paradox was born.

In 2023, it remains alive and well. Over the past four decades, we've seen the advent of the World Wide Web, Google, the smartphone, and other flabbergasting technological advances. Despite these arrivals, plenty of the most common productivity measures have largely remained stagnant. In certain EU countries, productivity has even declined.[31]

Should we take it as a given that generative AI will let us do more with less?

No, says Eli Dourado, a senior research fellow at the Center for Growth and Opportunity at Utah State University. As he wrote on his January 2023 Substack, "What if AI ends up like the internet—transformative to our daily lives while somehow not actually delivering major productivity gains? It's worth considering."[32]

General or aggregate trends always mask individual and group differences. Some cohorts will benefit more from generative AI than others. We just don't know which ones yet.

Massive Job Losses?

These newfangled generative AI tools are exciting and more than a little addictive. (The phrase *time suck* comes to mind.) Some might see them as innocuous. For example, let's examine image-generation programs. What's the harm in creating a few goofy images like Bart Simpson holding a book?

In October 2022, I hired a local photographer to take a few headshots. I wanted to spruce up my website and add a more recent pic to the back of my book *Low-Code/No-Code*. I spent a modest $120 for 50 pictures, one of which adorns the physical book.

Could AI have done the same?

Yes.

The AI portrait app Lensa launched in 2018 and performed respectably. That is, it caught lightning in a bottle à la Instagram in 2010. In late 2022, Lensa soared in popularity after its newly launched magic avatar feature went viral.[33] At that time, I downloaded it for my iPhone. I ordered fifty original AI-generated images for a whopping total of $3. After uploading eight existing headshots, Lensa spit out its creations. I didn't care much for Lensa's depiction of me in space, but some of its photos were pretty slick. Figure 5.7 shows a few of them.

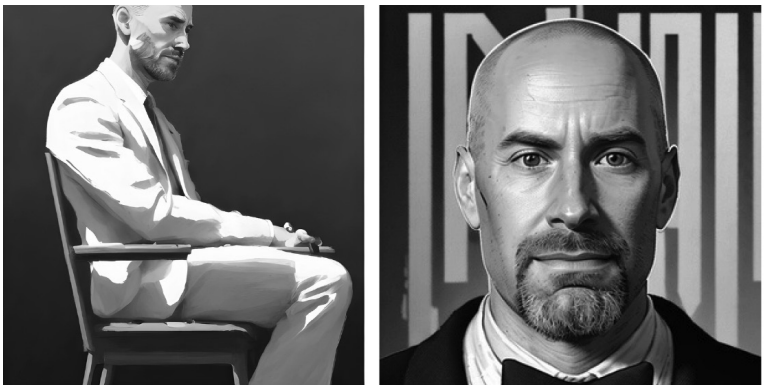

Figure 5.7: Lensa App Results

Will proper photographers go the way of travel agents? What about knowledge workers, like lawyers?

Erik Brynjolfsson is the director of the Stanford Digital Economy Lab and a professor there to boot. As he told David Pogue on *CBS Sunday Morning* in January 2023:

> If done right, it's not going to be AI replacing lawyers. It's going to be lawyers working with AI replacing lawyers who don't work with AI.[34]

Or, while we're at it, what about entire mega-corporations?

Some industry types have speculated that tools like ChatGPT may soon obviate search engines.[35] Google, as we know it, could become another AskJeeves. The juggernaut typically generates about $150 billion yearly for its parent company, Alphabet. That number presents more than 80 percent of Alphabet's annual revenue.[36] Will people use ChatGPT instead of Google? If they do, they won't click on ads—at least on Google's ads.

The idea that search engines may evaporate seems unlikely. Still, search just became far more interesting than it has been in twenty years. In early February 2023 Microsoft announced that it had already started integrating OpenAI's tech into Bing, its also-ran search engine. Early reviews from beta testers were positive. Johanna Stern of the *Wall Street Journal* wrote that "search will never be the same."[37] Odds are that Bing will capture a good chunk of its rival's 84 percent market share.[38]

Google's head honchos are too smart to sit back as Bing generates buzz. What's more, the company hasn't exactly been ignoring AI. Recall Ian Goodfellow from Chapter 2, the machine learning expert who bolted Apple for Google's DeepMind after the former ordered him back to work. As I was wrapping up the manuscript for this book, Google launched Bard, its ChatGPT competitor.[39]

Stay tuned.