WORLD'S MOST ADMIRED COMPANIES

FEBRUARY 2018

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TIPS FOR NEGOTIATING YOUR NEXT BIG RAISE

4 WAYS TO CATCH A HEADHUNTER'S EYE

READY, SET, JUMP!

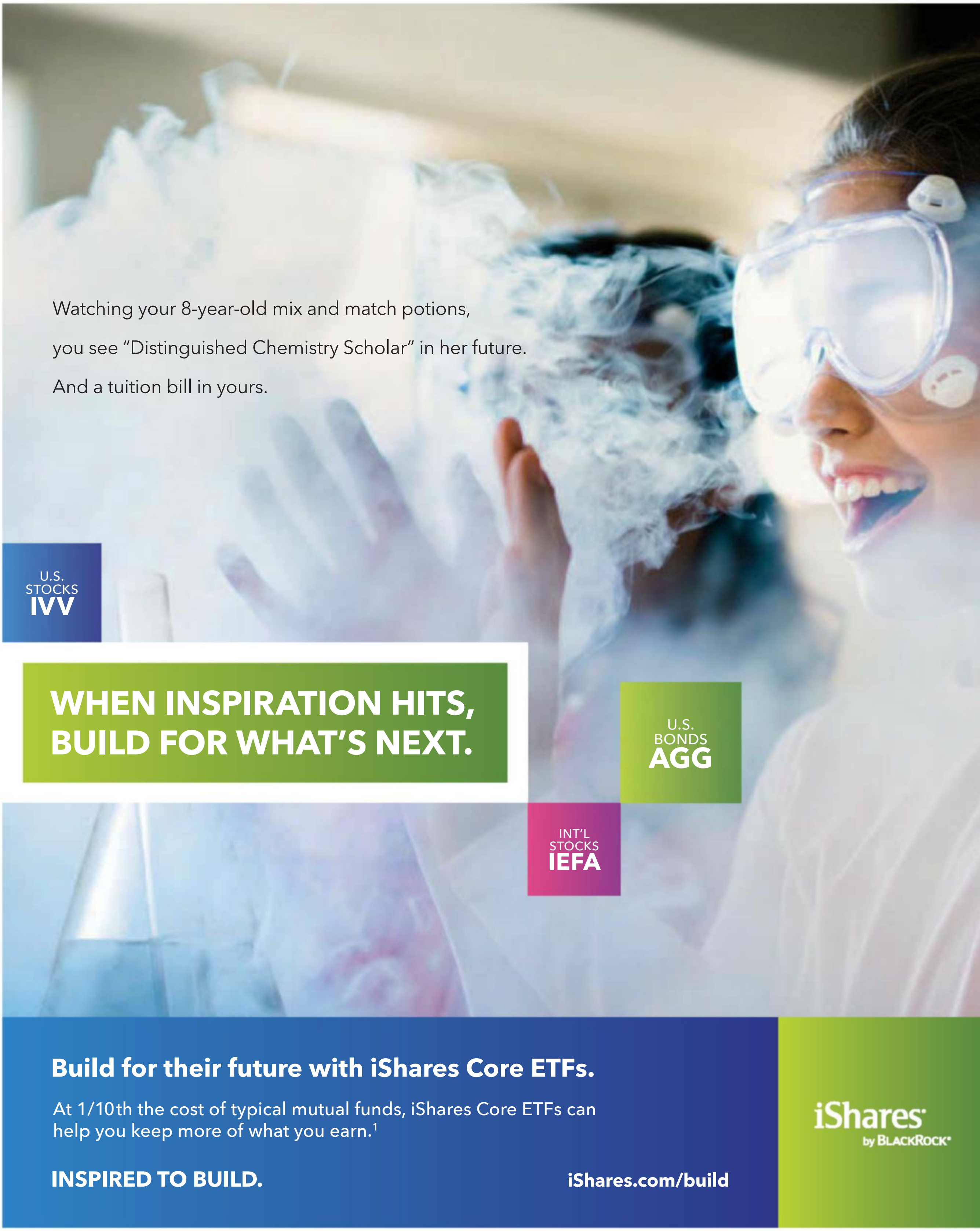
YOU'RE HIRED!

COMPANIES ARE FIGHTING FOR TALENT

HERE'S HOW TO PROFIT FROM THE ULTRA-TIGHT JOB MARKET RIGHT NOW

SHOW YOUR 'GRIT'

WHY LIFE EXPERIENCE IS THE NEW MBA


Watching your 8-year-old mix and match potions,
you see "Distinguished Chemistry Scholar" in her future.
And a tuition bill in yours.
U.S. STOCKS IVV
WHEN INSPIRATION HITS, BUILD FOR WHAT'S NEXT.
U.S. BONDS AGG
INT'L STOCKS IEFA
Build for their future with iShares Core ETFs.
At 1/10th the cost of typical mutual funds, iShares Core ETFs can help you keep more of what you earn.[1]
INSPIRED TO BUILD.
iShares.com/build
iShares by BLACKROCK

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Extreme weather is becoming more common, and the economic impact is soaring. **Text by BRIAN O'KEEFE; graphic by NICOLAS RAPP**

CORRECTION

"To Catch a Cryptothief" (Nov. 1, 2017) mistakenly referred to JSEcoin as a Monero miner. It is not. Rather, it mines its own coin—the eponymous JSEcoin.

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MAKE THEM WANT TO STAY

YOU MAY HAVE NOTICED a change in your colleagues: the guy who always wears jeans shows up at work in a sports coat and tie. Another is having hushed cell phone conversations on the far side of the office. A third asks you, offhandedly, what a “senior manager of X” ought to make and if you happen to have any extra ecru-colored stationery lying around.

As *Fortune* senior editor-at-large Geoff Colvin writes in our cover package (see “Ready, Set, Jump!” on page 44), the job market is heating up fast. Some 6 million openings are now waiting for the right individuals to fill them. The unemployment rate is a rock-bottom 4.1%—and much lower than that in many industries.

For would-be job-seekers, of course, that’s a welcome trend. As senior writer Ellen McGirt explains in her eye-opening feature, “Grit Is the New MBA” (page 54), it has also unleashed a new market force: This electrified employment market is placing fresh value on life experiences and personal qualities—like fortitude, adaptability, and creative problem-solving—that seldom enriched résumés before.

But for bosses and managers trying to keep their best talent from jumping ship, well, it’s a far more challenging time, even a frightening one. So what are companies doing to keep their rising stars in house, you ask? Not as much as you might think—and that’s giving a huge opening to the competition.

Veteran executive recruiter Karl Alleman, managing partner of Egon Zehnder’s U.S. practice, has a particularly good vantage point on this. The Chicago-based recruiter spends much of his time, after all, pulling talent out of companies—and his job is much easier when those companies don’t do everything they can to retain their best performers.

On this front, companies tend to fall short in two key ways, he says—and, surprisingly, it often has little to do with pay. “First of all, they need to do a better job of recognizing who their top talents are and then *telling* them that they’re top talents,” says Alleman. Companies will often identify the people who have the ability to grow and thrive—but then, he says, bosses “don’t do a good job of communicating to that individual that they see such potential and that they have a plan to help them fully realize it.” Some managers fear that word will get out that one employee is being favored, and that will risk ostracizing others on the team—or they don’t want to set expectations with the top performer that perhaps he or she can’t meet. “But if you have somebody who really is that good, you ought to let them know,” says Alleman. “Because if they don’t know that, they might not feel valued, and they might leave.”

Second, the majority of companies, he says, do a poor job of laying out an attractive career path for their people—a career path that will foster growth and learning. One good way is through a job-rotation program. “If you can paint a picture for them on how you’re going to help them fully realize their potential by moving them through different jobs—jobs in different geographies, or in different business units, or maybe even in different functions—to help round out their skills, that is really valuable,” he says.

Other options are to give the standout performer a so-called stretch assignment that truly tests her—or to put her on a strategic project.

It requires leadership from the top to foster such employee growth. But it really motivates high-performing staffers, he says, “and it sparks their curiosity.” And in this age of business disruption, says Alleman, “if there’s one character trait that people truly need, it’s curiosity: the desire to look around corners, to think about what the competition might be doing differently or what the customer might want.”

In the end, sparking your colleagues’ curiosity may have another benefit, too: It just might help you keep them when the headhunter comes around. ■

CLIFTON LEAF
Editor-in-Chief, *Fortune*
@CliftonLeaf

Building the Digital Future, One Company At a Time

With innovative approaches to supply-chain management, environmental stewardship, and emerging technology, **DELL TECHNOLOGIES** has transformed itself into a one-stop IT shop.

LAST SPRING, Dell Technologies signed a deal with software giant Salesforce to provide Dell Latitude laptops to 25,000 Salesforce employees. As part of the same deal, Salesforce committed to the use of Dell EMC infrastructure—including servers, data storage, and data protection—in all of its global business centers.

The Salesforce deal is just one example of what Dell Technologies calls its "No. 1 all-in-one-place" approach, a value proposition that reflects the company's standing as a leading one-stop shop for information technology. The Round Rock, Texas–based company (2017 revenues: $74 billion) serves 98% of *Fortune* 500 companies, offering hardware, software, and comprehensive IT services. "Dell Technologies provides customers with essential infrastructure to build their digital future, transform IT, and protect their most important asset: information," says Chairman and CEO Michael Dell.

The transition from computer maker to turnkey IT-services provider took root 18 months ago with the merger of Dell, the eponymous personal-computer company that had its beginnings more than 30 years ago in founder Michael Dell's college dorm room, and EMC Corporation, the enterprise software and storage organization. The merger brought together a family of businesses under Dell Technologies, which now includes Dell EMC, Pivotal, RSA, SecureWorks, Virtustream, and VMware. Dell Technologies now operates in 180 countries and employs nearly 140,000 people.

Since its inception, the company has distinguished itself with an innovative approach to supply-chain management, one that "makes technology more accessible to more people around the world," says Vice Chairman, Products and Operations, Jeff Clarke.

The company is also an innovator in sustainable manufacturing, using recycled plastic and carbon fiber in its products and piloting the reuse of recycled gold from computer motherboards. Recycled ocean plastics are also used in sustainable packaging, all while cutting packaging costs. In December, the company formed a working group called NextWave, which partners with the nonprofit organization Lonely Whale to keep millions of pounds of plastics from entering the oceans.

What is the company's recipe for ongoing success? A focus on growth while maintaining its bold, fast-decision-making culture. A bias to action is a real strength, says Clarke. So is its unique structure, allowing the company to be nimble and innovative like a startup, with the scale of a global powerhouse.

"It's all about anticipating technological advancements and helping our customers realize their digital futures." ■

"It's all about anticipating technological advancements and helping our customers realize their digital futures."

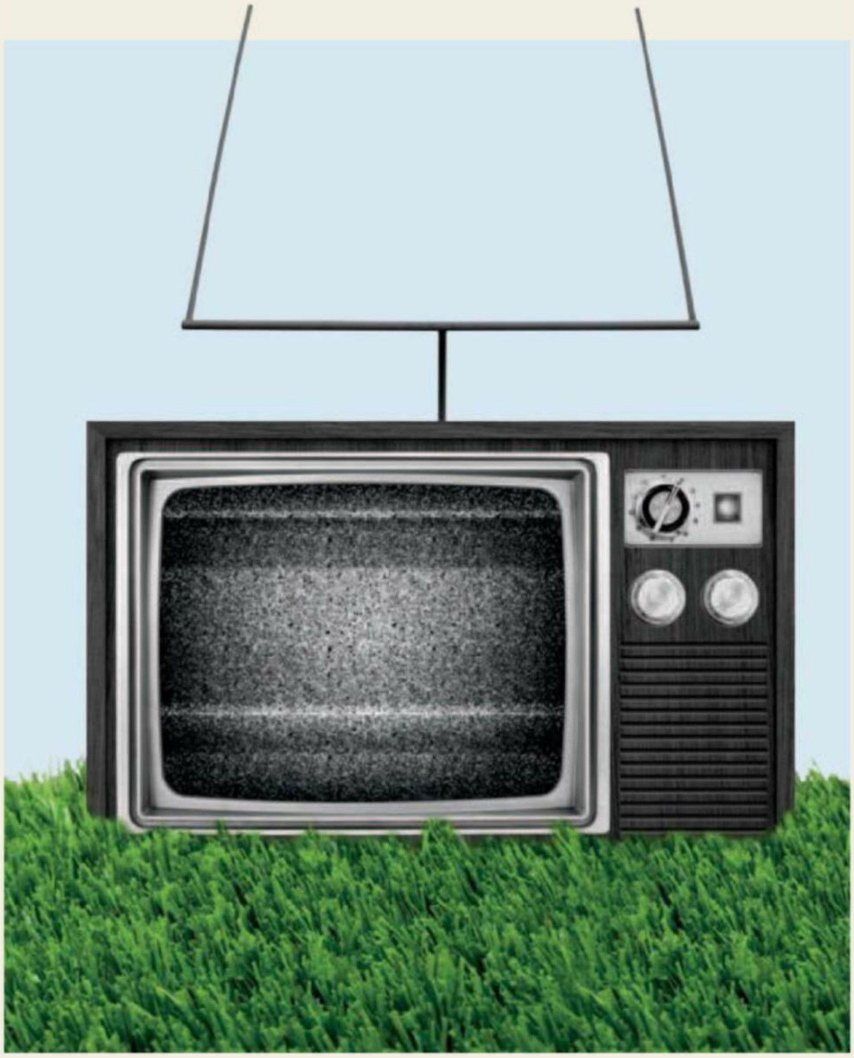
JEFF CLARKE
Vice Chairman, Dell Inc.

THE WORLD IN 7 PAGES

BRIEFING

Super Bowl Ads Can't Save TV

Marketers will spend millions on television advertising during football's main event. If only they cared more about it the rest of the time. By Erika Fry



THE BIG GAME **FOR AT LEAST** a few hours on Feb. 4, everything will be peachy in ad land. A nationwide audience, more than 100 million strong, will gather round their televisions and pay rapt attention to commercials that cost roughly $5 million a (30-second) pop.

The occasion, of course, is the Super Bowl. Long a triumph of modern marketing—an annual ritual in which the ads are as big a deal as the athletics—Super Bowl LII looks to be especially so. Despite cord cutters and ad-skipping DVRs, flagging NFL ratings, and the ever-shrinking American attention span, big brands (Budweiser and Coca-Cola) and even some no-names (Avocados From Mexico) are still eager to pony up a huge chunk of their marketing budgets for a spot during the big game. (A decade ago, the cost for this was just $2.7 million). "It's such a predictable, high-quality event," explains Manish Bhatia, CEO of ▷▷

GOALPOSTS: SKIP O'DONNELL—GETTY IMAGES; TV: MGKAYA—GETTY IMAGES; STATIC: MARIA AREFYEVA—GETTY IMAGES; GRASS: YUSUF SARLAR—GETTY IMAGES

▷▷ Kantar Media North America.

Last year's broadcaster, Fox, fetched $534 million in advertising revenues from the one-day bonanza. This year's, NBCUniversal, also has rights to the 2018 Winter Olympics, and expects to rake in more than $1 billion between the two sporting events.

That will be a boon to the network in 2018. But after the glamour of the gridiron has faded, and the fans have moved on, the TV ad industry will still be slowly and surely headed for a reckoning.

Traditional television, long the most reliable and wide-reaching of media, is losing ground (and lots of young viewers) to ad-free streaming services and other digital alternatives. The ranks of cord cutters reached 22.2 million in 2017, a 33.2% increase from the year before, according to eMarketer. Netflix now has more U.S. subscribers than cable. And while Americans over the age of 65 still watch roughly 50 hours of traditional TV per week, 18- to 24-year-olds tune in for less than 13 hours—44% less time than five years ago, according to an analysis of Nielsen data by MarketingCharts.com. Ratings for must-watch live events like the Oscars and pro sports, the last bastion for ambitious TV advertisers, have also started to slip. Even the Super Bowl, TV's most reliable event, may not be immune: Viewership declined slightly in 2016 and 2017.

Brands, following the lead of their audiences, are beginning to turn away from traditional television too. Last year, for the first time, global ad spending on digital platforms exceeded the dollars spent on TV—by a solid $31 billion margin (see chart). The U.S. hit that milestone in 2016, and the spread is widening.

However, not every marketer is sold on the superiority of online ads. While they dominated the marketplace in 2017, they've also come under considerable scrutiny for brand-safety concerns (ads running alongside unsavory content like ISIS videos) and charges of fraud (ads being viewed solely by bots, for example). Facebook, which admitted to overstating the reach of ads on its platform in 2016, was freshly accused of doing the same thing in 2017. "We keep feeding the beast by pouring incredible sums of money into this unproductive, unmanageable abyss," Bob Liodice, CEO of the Association of National Advertisers, told an audience at the group's annual conference last October. Some heavy hitters agree: Procter & Gamble, the world's largest advertiser, cut its online ad buy by more than $100 million last year while reportedly upping its buy for TV at the 2017 Upfronts.

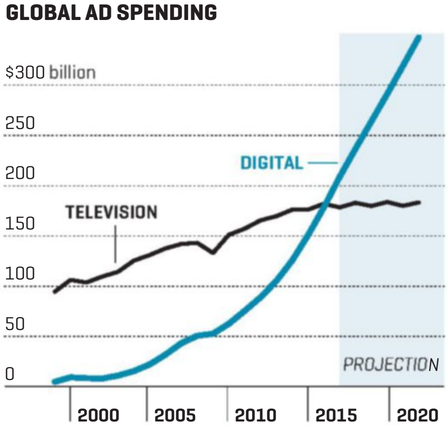
Digital's biggest advantages—precise targeting and the seeming ease of measurement—may be under assault from TV now too. There are industry efforts underway to develop audience-targeting as well as attribution tools that better demonstrate TV ad effectiveness. In theory the latter could trace video ad exposure to consumer purchases or other shows of interest. The television industry is hoping that, once it catches up, the data will make its case.

But for the foreseeable future, the question for many companies won't be which media, but how much of each. Big-game commercials, for example, are usually part of larger campaigns that garner plenty of online attention on Facebook, YouTube, and more. The only thing sure to reach more viewers than a Super Bowl ad, after all, is a Super Bowl ad that goes viral.

DIGITAL ADS ARE KING, SUPER BOWL ASIDE

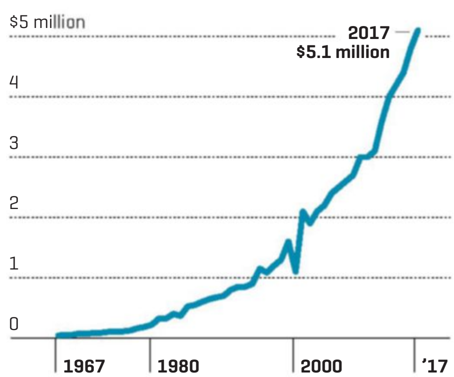
Global TV ad expenditures were finally overtaken by digital spending last year, and the disparity is growing. Super Bowl ads, however, now sell for $5 million and remain a bright spot for networks.

GLOBAL AD SPENDING



SOURCE: MAGNA

AVERAGE COST OF A 30-SECOND COMMERCIAL DURING THE SUPER BOWL

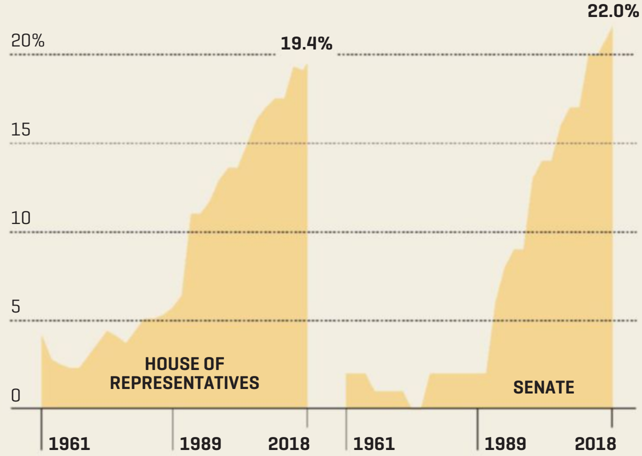


SOURCES: AMERICAN MARKETING ASSOCIATION; KANTAR MEDIA

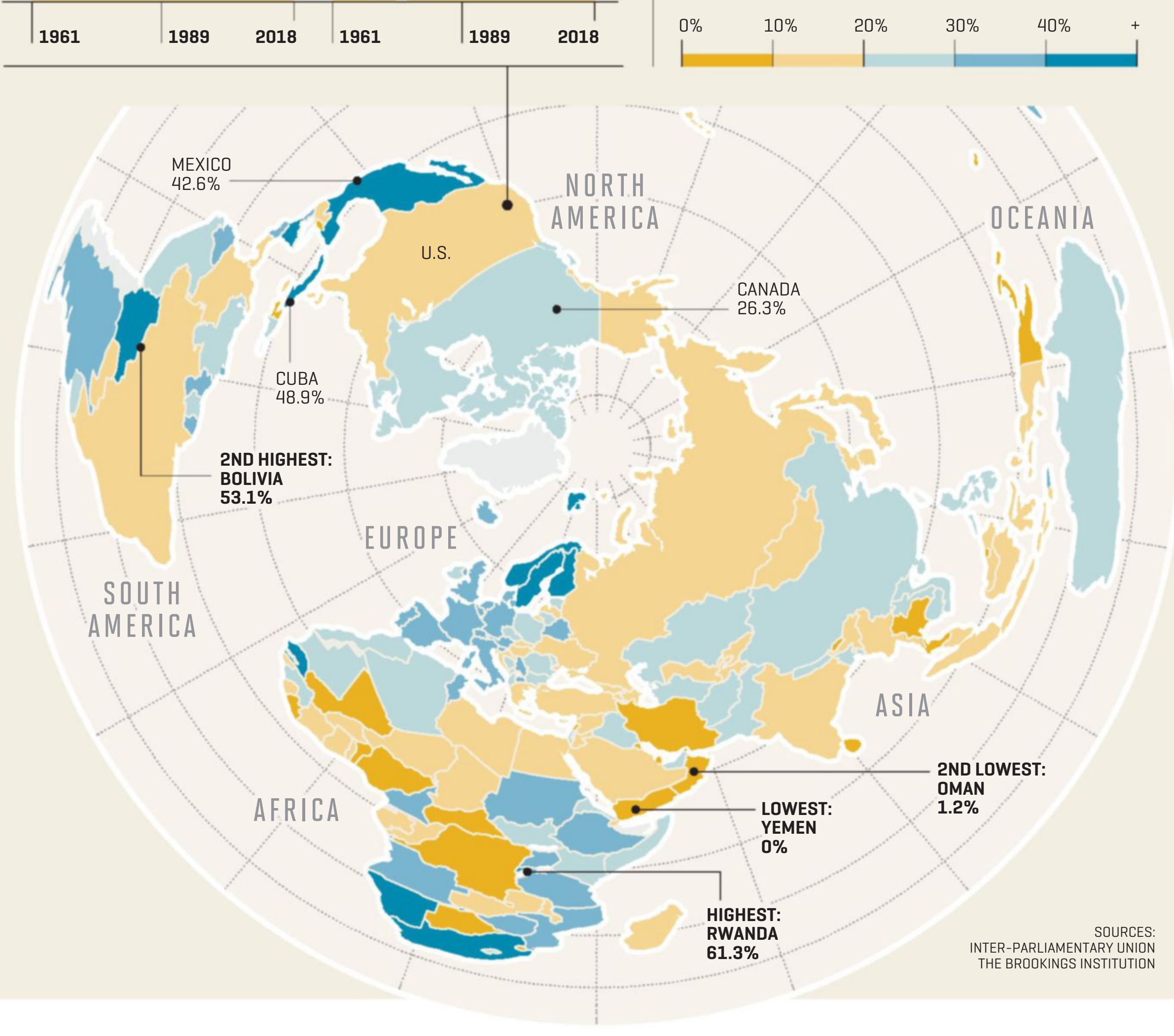
WOMEN SENATORS BREAK A RECORD, BUT THERE'S STILL A LONG WAY TO GO

AFTER EMBATTLED MINNESOTA Sen. Al Franken resigned his seat in January, Democrat Tina Smith took his spot. Her swearing in was a watershed moment, bringing the number of women in the Senate to a record 22. But despite recent years' progress, just 19.4% of members of the House of Representatives are women (it's only slightly higher in the Senate), a weak showing relative to the rest of the world. The U.S. places 99th globally in terms of percentage of female legislators or parliamentarians—two spots below Saudi Arabia.

PERCENTAGE OF WOMEN IN THE U.S. CONGRESS



PERCENTAGE OF WOMEN IN THE LOWER OR SINGLE HOUSE (EQUIVALENT TO U.S. HOUSE OF REPRESENTATIVES) As of December 2017



SOURCES:
INTER-PARLIAMENTARY UNION
THE BROOKINGS INSTITUTION

POLLUTION

THE RISING COST OF SMOG

IN DECEMBER, a Sri Lankan cricket player in Delhi doubled over during a match and began to vomit. The reason: suffocating air pollution. India's smog is often accepted as a by-product of the world's fastest-growing major economy, but new research is increasingly showing the costs of bad air may be higher than imagined. One recent paper on Chinese counties found that high pollution levels are capable of causing net out-migration of 5%—a potentially devastating economic blow, especially because those most likely to leave are wealthy and educated. Paulina Oliva, one of the paper's authors, says big-data advances are now allowing for a clearer view of smog's cost-benefit equation. In 2016 the World Bank estimated that the health toll of air pollution topped $5 trillion a year. But the total economic costs are still untold.

Retailers' Secret Weapon Is ... Food?

It makes up more than half of Walmart's sales and is driving a Dollar General surge. Why groceries are suddenly a hot business.

By Phil Wahba

LOSS LEADERS

DOLLAR GENERAL CEO Todd Vasos did a victory lap on a recent conference call, finishing off a year that saw the stock rise 25%. One star of the celebration? Groceries. The discount chain, better known for cheap toothpaste and $1 tchotchkes, has been increasingly moving into fresh produce and even fresh meat, vastly expanding its cooler space—and seeing more foot traffic as a result. Now Vasos says the chain will add about 100 additional stores that offer groceries. His assurance to investors: There's "more and more opportunity" in food.

But Dollar General isn't the only chain vying for produce-aisle domination. German discounter Lidl is six months into a plan to open its first 100 stores stateside. Its Teutonic rival Aldi opened 150 locations last year. Add to that Walmart's massive investments in the $172 billion U.S. grocery business that makes up 56% of its revenue (its food biz recently had its best quarter in six years), plus Target's attempts to reemerge from the supermarket grave, and food is one of the hottest areas in retail.

So why all the excitement for groceries, a category with notoriously low margins and well-established incumbents? It generates shopper visits galore (everyone needs milk) and acts as a loss leader for more profitable goods.

While the food fights rage on, there's one clear early winner: consumers. After Lidl opened its first 47 stores, Kantar Retail found its goods were often cheaper than Walmart's. Six months later, Walmart docked prices to regain the lead. As U.S. grocery bills fall, stores are getting squeezed. Target is on its third attempt to fix its grocery business, and Lidl recently scaled back its U.S. expansion plans, opting for much smaller stores. For shoppers, discounts are tasting sweeter than ever.

1
BILLION-PLUS POUNDS
Bananas are Walmart's top-selling item.

The Decline of American Fertility

Falling U.S. birth rates could precipitate an economic crisis.

By Lyman Stone

DEMOGRAPHICS

SPENDING on Valentine's Day could easily top $18 billion this year, according to National Retail Federation averages. But consumers may be getting less, er, bang for their buck than ever.

Research from the General Social Survey shows that American sexual frequency, even for couples in committed relationships, is falling. This is likely one of the many reasons that the total fertility rate in America is projected to fall to 1.77 (or fewer) lifetime births per woman in 2017 (final numbers aren't in yet), down from more than two before the recession. Such a low birth rate means that without strong immigration flows, the U.S. population will begin to decline within the next 40 years—a potentially disastrous outcome.

The causes for the decrease are unclear. Rising health care and housing costs, greater smartphone usage diminishing in-person interaction, and even political concerns are all potential culprits. The drop-off has been particularly rapid over the past two years, defying most long-term, structural explanations.

The consequences, however, are easier to understand. Fewer births means slower growth, which means more regions will see declines in population. With decline comes increased risk of public-sector bankruptcy, diminished opportunities for economic advancement, less opportunity for creative new entrants into markets, and often a turn toward extreme politics. Not a feel-good Valentine's Day prognostication, but one that, with every new child, could become less likely.

PAGE 5

BOOK VALUE

WHEN TO DO EVERYTHING

DON'T GET MARRIED too young. Don't spend your morning on email. And definitely don't schedule surgery in the afternoon. In his latest book, business author Daniel Pink provides a tour de force of research on perfect timing. *When*'s practical tidbits include how late-twenties marriages last longer, why no one should waste productive morning hours on rote tasks, and how doctors—along with the rest of us—make more mistakes in the afternoon. It's a refreshing addition to the managerial bookshelf. **COCKTAIL PARTY FODDER:** Singing in time with a group is arguably as good for you as exercise.

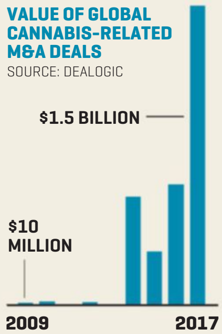
FUTURISM

WHAT CAN A.I. DO FOR YOU?

"The simplest autonomous machine is the self-driving car. Of course, it's also the most impactful. The idea of driving a car that's completely driverless everywhere in all conditions? That fantasy car won't be here for five to 10 years."

—Nvidia CEO Jensen Huang, speaking with Fortune*'s Adam Lashinsky in January at a Brainstorm Tech dinner in Las Vegas.* Fortune*'s Brainstorm Tech conference will take place in July.*

▲ PHOTO ILLUSTRATION BY **TRES COMMAS**



GROWTH MARKETS

CANNABIZ DEALS HIT NEW HIGHS

MARIJUANA M&A dealmaking is heating up in North America. In January, California legalized recreational weed, expected to be a $7 billion market in the state by 2019. And this summer, Canada plans to legalize the drug across the entire country.

Cue an industry frenzy: Global weed M&A hit nearly $1.5 billion in 2017—up from just $12 million in 2012, according to Dealogic. That's largely driven by Canadian companies, as the industry consolidates ahead of its big moment. Meanwhile legal clouds, including opposition from the Trump administration, linger over the industry in the U.S.

But don't count America out. The marijuana market stateside, already worth an estimated $6 billion, is expected to grow at double-digit rates for the next four years.

—GRACE DONNELLY

Tech Dissatisfaction, Version 99.0

It's easier than ever for companies to update products remotely—or to stunt them. And consumers are taking notice. By Robert Hackett

OBSOLESCENCE

IT WILL get better—or so they say. Today's flashiest tech titans have pioneered a new approach to business: unrelenting, iterative improvement. Their products—Amazon's Echo, Google Chrome, Tesla cars—are never quite finished developing. The coder crowd has gotten better and better at making mousetraps that get, as if by magic overnight, faster and smarter. As a one-time purchaser of any auto-updated gizmo, you benefit. Consider that upgrade "on the house."

Yet, despite the mega-advances in machine learning and never-ceasing upgrade prompts, tech's time-tested tradition of enticing consumers to trade in the old model for the new one (and the newer one after that) is as strong as ever. And after a few recent scandals, many are increasingly wondering if companies might actually be using their auto-upgrade powers to make those older products not better, but worse.

Take the iPhone. In December, Apple faced a backlash for retarding old handsets, apparently to prevent them from randomly switching off. The $900 billion computer maker said it intended the year-old software tweak to "improve power management" for devices with aging batteries, but the move also hindered phones' performance and stalled apps. In Apple's view, the interference was in consumers' best interest: a kludge to halt shutdowns caused by outdated lithium-ion electrodes. But for some Apple customers (not given a choice between slowdowns or shutoffs) it felt like that iOS upgrade was, in fact, a downgrade.

Whether or not you side with Apple, expect more controversies like this going forward. Last fall Tesla came under fire for its practice of limiting the range of some vehicles. And in recent weeks, software makers have addressed serious flaws in the microprocessors of nearly all computers by issuing patches that add considerable lag—again triggering anxiety. Consumers are just now learning that updates can enhance but also impair. The tech lords giveth, and the tech lords also taketh away.

DOMINOS: ISTOCKPHOTO—GETTY IMAGES; PHONE: XEFSTOCK—GETTY IMAGES

A Hotel-Turned-Jail Will Soon Turn Back

The Saudi kingdom's most luxurious hotel has been doubling as a detention facility. How bad is that for business? By Vivienne Walt

HOSPITALITY

FOR THE OILMEN, consultants, and dealmakers frequenting Saudi Arabia, the best place to rub shoulders with the rich and powerful has long been under the crystal chandeliers in the marble lobby of the Ritz-Carlton Riyadh. "It can take 45 minutes to walk from one side [of the hotel] to another," said one longtime American guest. "It feels like a palace."

Now, following what the government called an anti-corruption crackdown, the hotel has become the world's cushiest temporary prison, transforming on Nov. 4 into a holding cell for more than 150 Saudi businessmen and royal family members.

But what of the millions the Ritz-Carlton operator typically makes when it's not being used a high-end jail? When *Fortune* called the Chevy Chase, Md., company to book rooms for Christmas, a befuddled agent said, "We have no idea when it will reopen." Recently, online bookings became available starting Feb. 14, and guests can again reserve that royal suite—for just $5,566. The fate of the remaining occupants is still unclear.

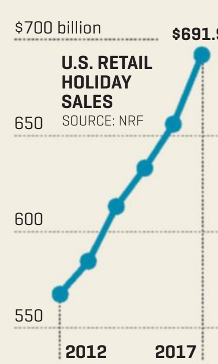
As is true for many hotels in the region, its ownership is murky. Engineering firm Oger International, which built the complex, names the Saudi government and Ministry of Finance on its website as the clients. But "finding out who owns hotels is not terribly easy," says Philip Wooller of hospitality-data company STR. As for whether the government will reimburse the hotel operator, Wooller says, "We will never be privy to that information." ■

GIFTS

WHAT THE STRONG HOLIDAY SEASON MEANS FOR STORES

THE IDEA that there is a retail Armageddon devastating the land has finally been debunked. During the all-important holiday season, Target, J.C. Penney, American Eagle Outfitters, Kohl's, Costco, and even Macy's reported strong sales. Kohl's stunned with 6.9% growth fueled by bricks and mortar, even as online revenue rose 26%. Target finally saw the fruit of multibillion-dollar improvements to its supply chain and store remodels. And Macy's streamlined approach is wooing back shoppers.

Of course, conditions were perfect for stores this year—weather cooperated, stocks were up, and wages rose. If retailers can't also perform when things get tough, however, the reckoning may not have been avoided so much as delayed. —PHIL WAHBA



BARS: PIOTR POWIETRZYNSKI—GETTY IMAGES; FOUNTAIN: DESIGN PICS INC.—ALAMY

Government of India
Ministry of Commerce and Industry
Department of Industrial Policy and Promotion

"We are not merely reforming India, we are transforming India. We are not merely changing India, we are building a New India."

Narendra Modi
Prime Minister Of India

WHAT'S NEW IN NEW INDIA?

- A consumer market worth USD 3 Trillion by 2025
- The 2nd largest startup ecosystem in the world
- GST Implemented: One nation, One tax
- A jump of 42 places in the World Bank's Ease of Doing Business rankings (2014-2017)
- No.1 greenfield FDI destination in the world
- No.1 choice for MNCs looking to establish R&D centres outside their home country
- No.1 on the Growth, Innovation and Leadership Index*

MEET NEW INDIA AT DAVOS 2018

You can catch Prime Minister Narendra Modi's inaugural address at the plenary session of the World Economic Forum, Davos 2018.

DATE: **23rd January, 2018**
TIME: **10:00 AM GMT**

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*(Frost & Sullivan)

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Sedric, Volkswagen's fully autonomous concept car.

OPEN THE POD BAY DOORS

Meet Aurora, a spunky self-driving-car startup that emerged from secrecy with a potent pedigree and powerful partnerships.

By Kirsten Korosec

TECH **SPECIALISTS WHO WANT** to save the world? Certainly. Technicians who seek to push the envelope? Absolutely. Self-proclaimed superstars without a clear job to interview for? Sure, we'll take 'em.

But no jerks.

Sterling Anderson, Drew Bagnell, and Chris Urmson—cofounders of Aurora Innovation, a buzzy technology startup that has until recently operated in secret from offices in Pittsburgh, San Francisco, and Palo Alto—will do just about anything to bring self-driving cars to the world quickly and safely. But the men are just as concerned with who will bring autonomous ▷▷

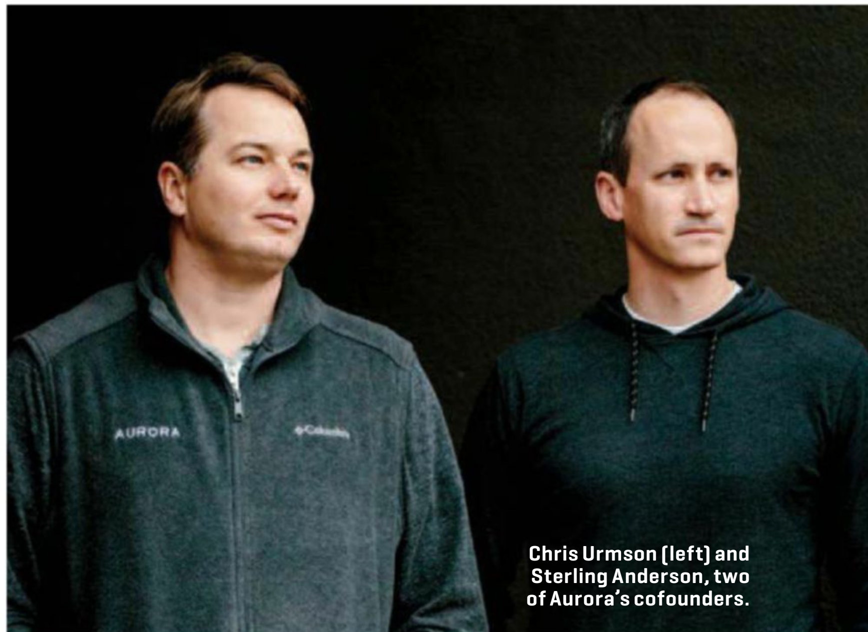
COURTESY OF VW

technology to the driving masses as much as accomplishing the mission. “It’s important that we find people who are excellent at what they do,” Urmson says, “but it’s also important to us that they’re actually good human beings.”

For a small company competing in a cut-throat race to commercialize autonomous vehicles, Aurora’s emphasis on soft skills might seem like a costly distraction. The stakes are certainly high: Autonomous vehicles are expected to give rise to a “passenger economy” worth $800 billion by 2035 and $7 trillion by 2050, according to a 2017 Strategy Analytics study. But Aurora can afford to be picky. The company’s three cofounders are considered to be some of the best minds in self-driving cars. Anderson is the former director of the Autopilot program at Tesla, Bagnell headed the autonomy and perception team at Uber’s Advanced Technologies Center, and Urmson was the former head of Google’s self-driving project, now a discrete business called Waymo.

Aurora works with automakers to design and develop a package of sensors, software, and data services—the “full stack,” in industry parlance—needed to deploy fully autonomous vehicles. Aurora is focused on Level 4 autonomous systems with an eye toward Level 5. (Level 4 is a designation by SAE International, the automotive engineering association, for autonomous vehicles that take over all driving in certain conditions. In Level 5 autonomy, the vehicle is self-driving in all situations.) “What’s most overlooked is how complicated the problem is,” Urmson says. “There’s a flood of companies that are indicating they’re going to come and solve this problem quickly. We understand where the pitfalls are and how hard this problem really is, and we’re building a company to go solve it for real, over time.”

Aurora’s pedigree and technology have attracted prominent partners. In January, the company announced collaborations with Volkswagen Group and Hyundai—two of the world’s largest automakers—to accelerate the development of fully autonomous vehicles for the masses. Volkswagen, for example, wants to launch commercial fleets of self-driving electric vehicles in two to five cities beginning in 2021. The automaker and Aurora have been working together for months to integrate the startup’s self-driving systems in custom-designed electric shuttles for VW’s new Moia brand. Volkswagen plans to launch two types of test fleets using Aurora tech in 2018: one for ride-pooling using Moia shuttles, the other for door-to-door ride-hailing service in the U.S. and Germany. The tests are VW’s latest steps in an aggressive autonomy strategy established in 2016 and bolstered with the sleek Sedric self-driving concept car the following year.



Chris Urmson (left) and Sterling Anderson, two of Aurora’s cofounders.

TECH

AURORA CAN AFFORD TO BE PICKY. THE COMPANY’S THREE COFOUNDERS ARE CONSIDERED TO BE SOME OF THE BEST MINDS IN SELF-DRIVING CARS.

But the road to revolution is riddled with hurdles. There are logistical challenges such as how to deploy self-driving vehicles without causing additional problems for cities. There is also the matter of stiff competition. Aurora’s business model puts it in direct competition with Waymo, the Alphabet-owned self-driving unit; Uber; GM-owned Cruise Automation; Argo AI, a startup in which Ford invested $1 billion in February 2017; and Aptiv, the Delphi spinoff that acquired self-driving-car startup NuTonomy for $450 million in October 2017. Aurora’s founders aren’t terribly concerned. “This is about realizing a goal that we’ve had for many years,” Anderson says. “We’re okay with there being multiple people developing these kinds of systems. That’s fine. I want to save and improve lives. It might sound superfluous or hackneyed, but that’s really it.”

What’s more, if Aurora gets it right, passengers will forget that self-driving technology is under the hood. “If it’s working,” Urmson says, “you don’t think about it.”

Next stop: the future.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OUT OF PRISON AND INTO THE VALLEY

Time behind bars can be a life sentence when it comes to job opportunities. But these tech entrepreneurs are finding that hiring former prisoners can provide a social good and make great business sense. By Jennifer Alsever

RICHARD BRONSON MADE MILLIONS ON WALL STREET in the 1990s, but by 2005 he found himself destitute with no home and no money—and only his sister's couch on which to sleep. No one would give him a job or even entertain the idea. "I tried to put the past behind me, but doors were slamming in my face," says Bronson.

The event that turned him into a pariah? A two-year stint in federal prison for securities fraud that followed Bronson's time as a partner at the infamous Stratton Oakmont brokerage firm, dramatized in the movie *The Wolf of Wall Street,* starring Leonardo DiCaprio. Eventually, nine years after his release from prison, Bronson landed a job at a nonprofit in New York that aimed to help ex-convicts get back on their feet. There he learned that, as a white male with a college education, his reentry into society was easier than most—especially compared with people of color with no education. Says Bronson: "As long as there's the Internet to search, you're walking around with a life sentence."

That mindset is changing as the number of people coming out of prisons grows—600,000 released from state prisons each year and 11 million from jails—and jobs go unfilled. Add to that the fact that the U.S. spends $87 billion a year imprisoning 2.24 million people—and at least half of them get arrested again within eight years of release.

Contributing to their struggle is the challenge of getting hired. Nearly half of employers still ask for criminal history on job applications, according to a 2017 survey by Sterling Talent Solutions, a firm specializing in employee background checks. ▷▷

ILLUSTRATION BY **SAM PEET**

▷▷ In 2016, more companies including Facebook, Google, and Koch Industries made public their promise to consider hiring people with criminal records as part of former President Obama's Fair Chance Pledge. Bronson jumped in to help them.

Last year he launched 70MillionJobs, a for-profit recruiting firm for people with a criminal record. The startup graduated from the Silicon Valley accelerator Y Combinator, landed $650,000 from investors, and hired seven employees to achieve its ambitious goal: finding jobs for 1 million of the 70 million Americans with a criminal past. (For more on the changing job market, see this issue's cover stories.)

What's happening in Silicon Valley with 70MillionJobs is part of an important shift occurring nationwide.

In Denver, for instance, Mile High WorkShop wants to be the first employer of record for a string of former inmates. Inside a 12,000-square-foot warehouse, those employees handle woodworking, sewing, and order fulfillment, and they manufacture ceramic components for up to 100 clients including CoorsTek, Meier Skis, and Cora, a feminine-products company. Ideally, employees get not only work but also the life skills and references needed to get another full-time job. In just two years, 50 people have moved through the company, with half finding permanent employment; just two have re-offended.

In San Francisco, husband-and-wife tech veterans Beverly Parenti and Chris Redlitz have been training prisoners to be coders and entrepreneurs—even before they get out of prison. Their nonprofit, the Last Mile, teaches software programming, design, and entrepreneurship in four California prisons—using computers without Internet access. Over the course of four years, a string of local tech executives and entrepreneurs have come in as guest speakers, garnering connections that have led to higher-paying jobs when prisoners are released. Those enrolled in the group's web development shop inside San Quentin State Prison do design work for businesses while still behind bars, building their portfolios, references, and cash for when they get out.

To participate, prisoners must have 18 to 36 months of good behavior before applying and must have their GED, take appropriate math and algebra classes, write an essay, take a logic test, and agree to an in-person interview. None of the 320 people trained have returned to prison in the past eight years, says Parenti, and many have landed jobs inside tech companies after their release.

"They go on to be some of the best employees because they're loyal and grateful, and they bring that drive and spirit," says Parenti. She intends to expand the Last Mile into three more California prisons and one Indiana prison this year.

The same philosophy is being applied in Baltimore, where a company called Rowdy Orbit Impact is training a dozen black and Latino ex-prisoners for programming and quality assurance tech jobs. The yearlong program includes wraparound social services that teach professionalism and life skills they may have lacked growing up. Rowdy Orbit Impact will then place those people into jobs that might pay $40,000 a year to start. Software platform GitHub is developing the curriculum.

For Rowdy Orbit founder Jonathan Moore the mission is to make people of color with criminal pasts feel confident in a business environment. "You get tired of people looking at you and treating you different because of what they see on the news," he says. "Some of these guys, their whole life people have been telling them they aren't anything. We're telling them they're an asset." ■

Guest speaker Joseph Cureton (seated) shows Rowdy Orbit Impact participants how to use Google Chrome to inspect lines of code.

© COURTESY OF ROWDY ORBIT

A KINDRED SOLE

Brooks Running believes your next pair of shoes will be custom-built for you, starting with a 3D foot scan. **By Phil Wahba**

TECH

AFTER HE ATTACHES SENSORS to my ankles, shins, and knees, a technician at Brooks, the Seattle running shoe maker, asks me to do a series of knee bends and run a few steps on a treadmill equipped with a camera. The device will capture my motion with the goal of recording the biomechanics of how I run. It will analyze how far my knees point away from each other and how the swing of my hips affects my knees. A running fanatic, I am intrigued that a machine could know my gait better than I do.

This biomechanical assessment, part of a service and philosophy that Brooks calls Run Signature, has long been in use by the company to help guide its customers to the best-fitting shoe in its arsenal. But the options so far have been limited to what Brooks can sell off the shelf.

Now Brooks, the top brand in specialty running with 25% of the shoe market, according to the NPD Group, wants to take that a step further. The company is working with tech stalwart HP to marry a runner's gait information with a three-dimensional foot scan generated by HP's new FitStation device. HP's technology can measure pressure along the foot as it lands in each stride. The data help Brooks determine how much polyurethane to inject in a shoe's sole to achieve the right density for as many as 30 zones of your foot.

At a time when Adidas, Nike, and other sportswear companies limit footwear customization to color and material, Berkshire Hathaway–owned Brooks seeks to create running shoes with customized performance elements as well as build data-rich digital customer profiles.

"Everyone is fighting commoditization," says Brooks CEO Jim Weber. "It's a shoe for you. It does exactly what you need it to do."

Brooks is testing FitStation at 12 locations; it will formally launch the effort in June and enjoy one year of exclusivity for HP's tech. (The companies are working with insole maker Superfeet, which can manufacture up to 500,000 pairs of shoes a year at its facility in Ferndale, Wash.) If successful, Brooks will continue its defiance of the malaise that has gripped the running shoe category, the result of a boom that has since fizzled. In its most recent quarter, Brooks' global footwear sales rose 14%.

HP, which has dedicated 80 full-time engineers to FitStation, hopes to extend its technology to apparel and eyewear. But Brooks is firmly focused on feet. Says Weber: "This is the fruition of our vision for how we want to build shoes." ■

Biomechanical data help Brooks make running shoes with custom levels of support.

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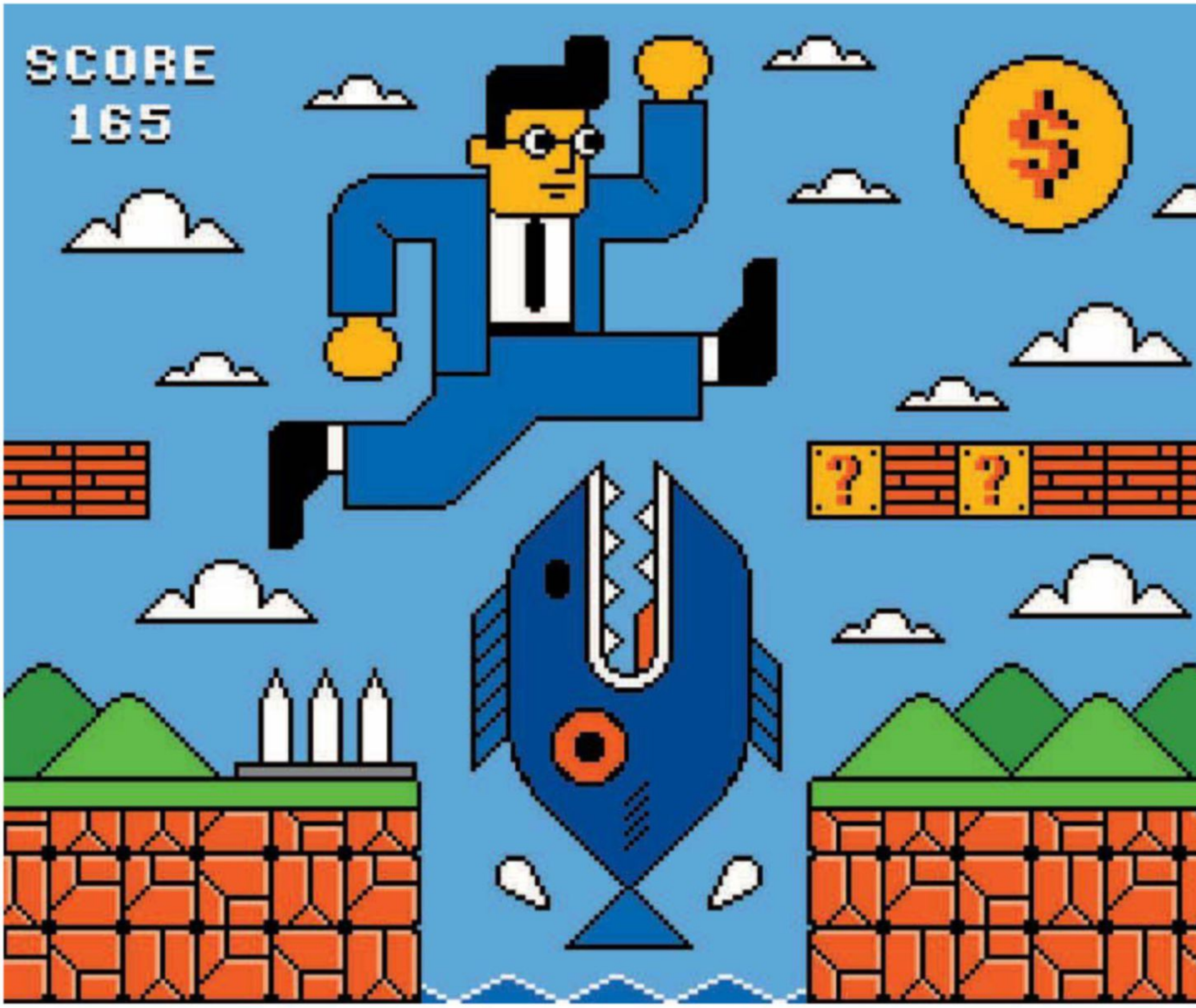


CAN VIDEO GAME STOCKS LEVEL UP?

Gamemakers like Nintendo, Sony, and Electronic Arts have been among the hottest stocks in tech. But some investors fear the rally could run out of lives. Here's why it isn't "game over" just yet. By Lucinda Shen

INVEST

IN THE YEARS BEFORE WORLD WAR II, British economist John Maynard Keynes boldly predicted that by the time his grandchildren were grown, the average person would spend just 15 hours a week at work, thanks to technological innovations.

Fast-forward 85 years or so, and there's at least one trend that's moving in the direction that Keynes predicted. American men between the ages of 21 to 30 worked an average of 203 hours less in 2015 than they did in 2000, according to a recent National Bureau of Economic Research working paper. But it wasn't because machines became man's best coworker. Rather, the authors postulated, much of the decrease was due to young men carving out more time for one technology in particular: video games.

Such is the appeal—and the economic-power—of gaming, a medium whose shadow ▷▷

▷▷ has expanded to eclipse music, movies, and television on the pop culture landscape. Revenue in the gaming market, including mobile, PC, and console games, is expected to grow 8% in 2018, to $134.5 billion worldwide, according to market research firm Newzoo. "It is the fastest-growing entertainment segment," says Tom Wijman, a market consultant at the firm.

Investors have raced to cash in, and recently they've been richly rewarded. In 2017, while the Nasdaq composite index rose 28%, the ETFMG Video Game Tech ETF, which tracks about 60 stocks related to the industry, scored a 60% gain. (The fund's cheeky ticker symbol: GAMR.) The question now is whether there is any more juice left in the rally. In an industry in which the hottest game franchises and playing platforms tend to go through boom-and-bust cycles, can video game stocks outdo today's high scores?

James Ayer, portfolio manager of the Oppenheimer International Equity Fund, believes they can. Ayer identifies several tailwinds that could keep the industry growing. For one, the sector has reached a sweet spot in its conversion from an over-the-counter retail model, in which players buy new games on discs from retailers, to an e-commerce model, with customers increasingly downloading games. That transition is enabling gamemakers to cut back on middlemen and reduce their expenses: Their gross margins are about 80% for downloaded titles, compared with 60% on packaged games, T. Rowe Price estimates.

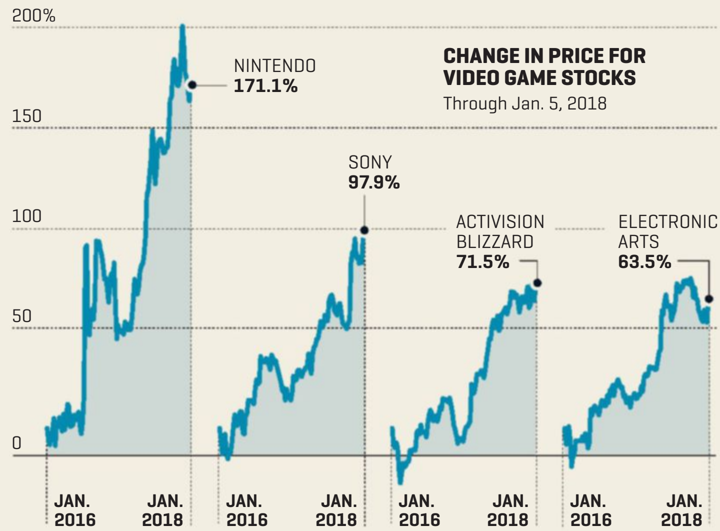
That's hardly the only source of new income for gamemakers. Consumers are spending more time playing games; they're also becoming more willing to make in-game purchases—spending real money to buy, say, new weapons for their fictional characters—enabling some companies to replace a dependency on new hits with a steady, recurring revenue stream. And thanks to the ubiquity of smartphones, mobile gaming is expected to become the fastest-growing segment of the industry in coming years, says Newzoo's Wijman.

No video game name was hotter over the past year than **Nintendo** **(NTDOY, $50)**, which enjoyed a dramatic turnaround thanks to the March 2017 release of its new handheld console, the Switch. In its first 10 months on the market, it became the fastest-selling game console in U.S. history, and the company expects to sell 14 million units by its first anniversary. Jefferies analyst Atul Goyal notes that Nintendo derives most of its earnings from software and games rather than consoles, so profits from the Switch are something of a bonus. And with the device still early in its product cycle, Goyal thinks Nintendo's earnings have six to seven more years to grow before peaking.

What's more, the company is on the verge of what Morgan Stanley analyst Masahiro Ono calls "a big chance to enter the China

HIGH TIMES FOR HARDWARE

Video game companies in general have thrived, but innovations in mobile play and virtual reality have given hardware makers like Nintendo and Sony a particularly big boost.



SOURCE: BLOOMBERG

▲ GRAPHIC BY NICOLAS RAPP

market." Nintendo has largely stayed out of that country until now, but it recently inked a distribution deal with Chinese Internet giant Tencent that will help expand the reach of some of its game franchises, and it is gearing up to introduce the Switch in China by early 2019.

Nintendo's stock looks relatively affordable despite its recent gains, with its American depositary receipt trading at a price-to-earnings ratio that's less than half its five-year average. But the company also faces potential pitfalls. In the past, Nintendo has struggled with delays in rolling out new versions of major game franchises, especially *The Legend of Zelda.* Similar setbacks could crimp revenue, says Goyal. Nintendo's ability to avoid such stumbles could determine how long investors' winning streak lasts.

While Nintendo has captured big returns from a new product, its Japanese rival **Sony** **[SNE, $50]** has squeezed unexpectedly strong results out of an old one. Though it's a highly diversified consumer electronics company, Sony's PlayStation 4 console—introduced five years ago—has become a major profit driver (see the box "Game Changers" to learn how), and the company now derives roughly 30% of its revenue from gaming. Bernstein senior analyst David Dai thinks Sony can grow gaming profits by more than 20% annually over the next three years. Downloads and in-game purchases are helping Sony too, even with games that Sony itself doesn't publish; console makers typically take a cut of up to 30% from downloads of games they didn't create, says Dai.

The big question for investors is whether gaming alone can sustain Sony's momentum. Sony is focused on turning the PS4, which streams music and video, into a connected home device. But the company has yet to confirm a launch date for the PlayStation 5—with educated guesses ranging anywhere from late 2018 to 2021. One potential danger sign: Last Thanksgiving, Sony offered a $100 discount on the PS4 for a price tag of $199, but the Switch still beat its rival console among online retailers while selling at full price ($299), according to data from Adobe's Digital Insights. And Sony's other business segments, like smartphones, are healthy but slower growing. Bottom line: The outlook for the company's stock is good, but shares aren't likely to match 2017's blistering 70% pace.

For all the headlines the device-makers have generated, many investors think in-game monetization is where the industry's next big wave of growth will come from. Wedbush Securities managing director Michael Pachter has gravitated toward **Electronic Arts** **[EA, $113]**, maker of popular sports titles like *Madden NFL* and *FIFA* soccer. Those franchises helped EA earn $1.81 billion in the 12 months ended mid-2017 from recurring sources such as microtransactions, subscriptions, and game expansions, up 25% from a year earlier. Of course, the formula doesn't always work; EA pulled in-game purchasing out of its *Star Wars Battlefront II* game last fall after facing a consumer backlash. But as gamemakers strive to please investors, such retreats are likely to be the exception, not the rule.

GAME CHANGERS

Two contrasting consoles, the venerable PlayStation and the new Switch, have delivered strong results over the past year for Sony and Nintendo.

NINTENDO SWITCH	SONY PLAYSTATION 4
The Switch is built around a relatively simple gimmick: You can use the same device to play both on your TV screen and on the go. Through its first 10 months on the market, it has been the fastest-selling video game console of all time in the U.S.	**The latest iteration in the 23-year-old PlayStation series is near the end of its life cycle. But recent innovations like the ultra-high-definition Pro version, virtual reality headsets, and the Vue live-TV streaming service have given PS4 sales an unexpected boost.**
PRICE (U.S.): **$299**	PRICE (U.S.): **$299**
POPULAR GAMES: ***Super Mario Odyssey; The Legend of Zelda: Breath of the Wild***	POPULAR GAMES: ***Horizon Zero Dawn; Call of Duty: WWII***
LAUNCH DATE: **March 2017**	LAUNCH DATE: **November 2013**
SALES: **4.8 million units in the U.S.; approximately 12 million worldwide**	SALES: **70 million game consoles; 2 million VR headsets; 400,000-plus Vue subscribers**

SHAKING UP THE STORAGE MARKET

INFINIDAT'S DISRUPTIVE INNOVATION APPROACH REDUCES THE COST OF FLASH STORAGE.

CONTROL PANEL OF AN INFINIBOX F6280 SYSTEM, CONFIGURED WITH 8 PETABYTES OF CAPACITY AND SERVING 913,000 IOS PER SECOND.

FLASH STORAGE HAS EMERGED AS A KEY TECHNOLOGY TO HELP BUSINESSES enhance performance, optimize efficiency, and support analytics projects. It's also prohibitively expensive at scale.

Fast-growing storage company INFINIDAT is changing that by leveraging machine-learning technology to significantly reduce the cost of petabyte-scale flash storage, making it affordable to many.

The company is breaking new ground with a disruptive innovation approach to storage. INFINIDAT uses software and math to extract extremely high performance out of lower-cost hardware, says Brian Carmody, the company's chief technology officer, "whereas traditional systems rely on frequent upgrades to the latest and most expensive generation of media for performance improvement."

INFINIDAT's chief executive officer, Moshe Yanai, invented the Symmetrix platform, which is said to have launched the modern data-storage industry, while at EMC Corporation. Additionally, much of INFINIDAT's development team came from EMC Symmetrix engineering.

"The disruptive innovation in our software is a patented machine-learning algorithm called Neural Cache, which learns a customer's workload, maintains a memory of every piece of data written into the system, and finds hidden connections in the access patterns. It makes tens of thousands of real-time data placement decisions per second about which pieces of data will be accessed by applications in the near future," Carmody says. It then stages that data into fast RAM and flash cache, while leaving 97% of "cold" data on low-cost, hyperscale disk drives.

The end result is a system that significantly outperforms hardware-based all-flash arrays, is more reliable and scalable, yet is less than one-third of the cost, Carmody says.

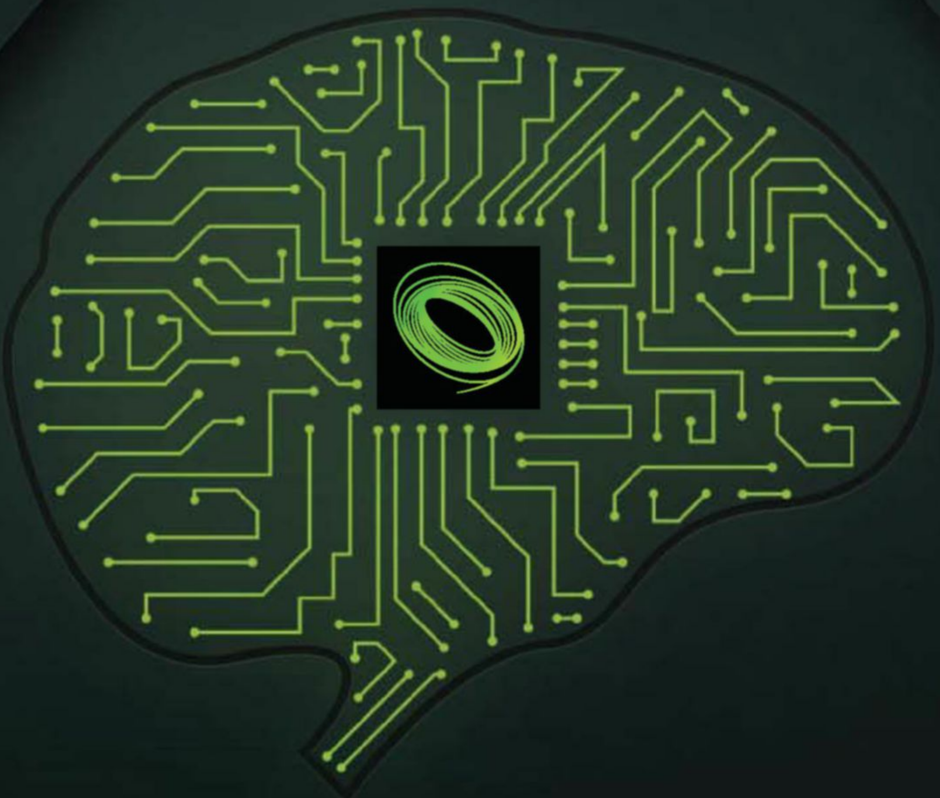
The approach must be working. INFINIDAT is setting industry records for growth. The company had its first installation in 2013, and since then, three exabytes of storage have been deployed by customers, including some of the world's largest banks, telecommunications companies, and cloud providers.

As research firm IDC pointed out in a November 2017 report, INFINIDAT is "quickly becoming a formidable competitor ... growing revenue significantly faster than any segment of the market."

One of the biggest challenges organizations face today is controlling IT budgets while supporting exponential data growth, Carmody says. He notes that IDC predicts global data will increase to 160 zettabytes by 2025, with the majority generated by businesses.

"The cost of storing all that data on enterprise all-flash arrays—at today's street prices—would be higher than the combined gross national product of all the countries in the world," Carmody says. "Clearly we need a new way of looking at the problem."

Demands for storage will likely accelerate as the Internet of Things generates even greater volumes of data. Disruptive innovation like that from INFINIDAT is needed "because the astronomical cost of enterprise storage is holding back innovation at companies in every industry," Carmody says. – ***BOB VIOLINO***



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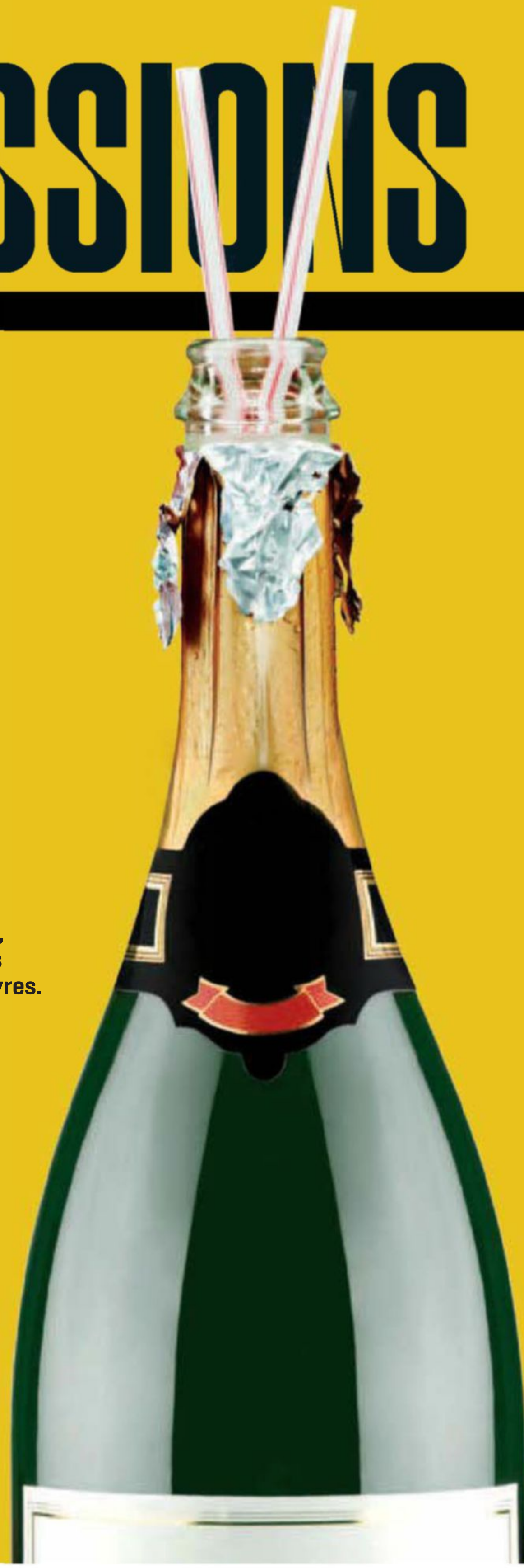
WELL SPENT

DRINK



CHAMPAGNE BEYOND THE BUBBLES

It's the drink of choice for celebrations, but Champagne is a wine that deserves to be enjoyed long past the hors d'oeuvres.

By Lindsey Tramuta

Armand de Brignac paired with a menu by Michelin-starred chef Arnaud Lallement.

A BOTTLE OF CHAMPAGNE MAY POP every two seconds somewhere in the world, but if enduring assumptions about how and when it should be consumed are any indication, they are likely celebratory pours. In his new book *Champagne: The Essential Guide to the Wines, Producers, and Terroir of the Iconic Region,* author and ChampagneGuide.net founder Peter Liem writes that the result of marketing Champagne by brand rather than by region over the past century has brought the heritage product worldwide success but also "de-emphasized the concept of Champagne as a wine, marking it more as a beverage for celebrations or special events, or an aperitif—with 'real' wines reserved for the dinner table."

Add to that the wine's inextricable association with royalty and celebrity, a link dating as far back as 496 AD, when King Clovis converted to Christianity in Reims, and you have an image that's difficult to bend. Think of the Emperor Napoléon, who is rumored to have been the first to saber a bottle while riding astride his horse.

"It's always bothered me that Champagne is situated between Alsace and Burgundy, two regions where people come to talk about terroirs and great wines," says Anne Malassagne, the fourth-generation co-owner of AR Lenoble Champagne, an independent and family-owned producer. "But when people come to Champagne, they ask about bubbles, luxury, and celebrities instead." The emerging prominence of grower Champagnes—sparkling wines produced by the same estate that owns the vineyards—has sparked a movement that emphasizes viticulture and terroir in Champagne production. That's a good start, but the discussion around it remains niche and largely confined to the wine industry, unlikely to reach the average Champagne consumer.

Still, there's room to shift the context for drinking it. Even Armand de Brignac, one of the industry's priciest brands (acquired by Jay-Z in 2014), is focused on diversifying its audience beyond nightclubs and VIP settings. "It's not about taking away the element of celebration but expanding perception beyond special occasions," explains Bernadette Knight, the company's CMO. One simple way to do that is by encouraging its Champagnes be served in a white-wine glass. "It's easier to get the nose in the glass and allows drinkers to explore the notes and characters the way they would with a still wine," adds Knight.

Actively engaging that shift in perception has led many producers to direct their attention toward experiences that highlight the pairing possibilities with a full meal, from low-key picnics to gastronomic tasting menus.

AR Lenoble recently inaugurated a professional tasting room and state-of-the-art kitchen in its Damery headquarters, where cooking ateliers (by appointment only) demonstrate firsthand that simple really is best (in other words, roasted chicken absolutely does go down better with a glass of AR Lenoble Brut Intense). Come spring, the producer will be offering Champenois lunches in a historic cabin that sits at the heart of its vines in Bisseuil.

On the high end of the spectrum, Armand de Brignac has launched an exclusive pairing menu with triple-Michelin-starred chef Arnaud Lallement at L'Assiette Champenoise, his five-star Relais & Châteaux hotel near Reims—the only culinary experience in the world (500 euros per person) to offer each of the house's five prestige cuvées in one place.

The initiated know that Champagne is first and foremost a grand wine, but combining it with exceptional meals, both high and low, creates an association that has the power to take it beyond the hoary image of a rarefied party accessory for a broader base. Because the inherent sexiness of *les grandes maisons* has worn thin, says AR Lenoble's Malassagne, and the discourse around Champagne, like everything we consume today, requires substance: "It's not enticing anymore. People want to talk about wine, about values, and what is sincere." Let's raise a glass to that.

FROM LEFT: PHOTOGRAPH BY DAVID MUIR—GETTY IMAGES; COURTESY OF JUILLET JERUSALMI FOR CHAMPAGNE ARMAND DE BRIGNAC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JOB MARKET **2018**

READY, SET, JUMP!

The job market is hotter than ever—and, for those in search of a new adventure, now's the time to take the leap. Here's what you need to know to land a new gig that showcases your talents ... or to make the job you've got even better.

By Geoff Colvin

▲ PHOTOGRAPH BY **JENNIFER LIVINGSTON—TRUNK ARCHIVE**

TIME WAS WHEN RECRUITERS AT INTUIT,

the software company that makes TurboTax and QuickBooks, could ask job candidates back for multiple interviews before making a decision. Not now. “We don’t have that time anymore,” says HR chief Sherry Whiteley. Competition for excellent candidates has become so brutal that “we’ve had to reinvent how we do recruiting.” Using a team of employees who have proved themselves sharp judges of talent, the company puts candidates through a day of interviews and tests. Then the team convenes and makes a decision. “A lot of times we’ll bring people in, and they get same-day offers. We’ve had to do it,” says Whiteley, who adds, “Recruiting keeps me up at night.”

Watch and learn: The war for talent that obsesses tech companies is intensifying and is about to spread economywide. After almost nine years of mostly sluggish expansion, the U.S. economy has shifted into a higher gear and is creating jobs at a record pace. “The new year has started with a job market as robust as any in recent years,” reports the Korn Ferry recruiting firm. Indeed.com, the most widely used job site, says, “Get ready for a hiring boom.” With the labor market tighter than it has been in decades, workers who’ve been yearning to change jobs finally have their moment.

Forecasters are highly confident of the coming boom because they’re looking at simple economics. About 6 million jobs are open at U.S. companies, near an all-time high. Yet employers are filling jobs at the slowest rate in three years, unable to sign the employees they need as more people find work and stop looking. Growing demand, shrinking supply—that’s the formula for rising prices, known in the labor market as pay.

Some recent statistics on demand have ticked down slightly but remain within the range of the past few months. Even if the market eased a bit, it would still be historically tight. Unemployment, at 4.1%, is the lowest since the economic boom that crested just before the 2001 recession. The Fed had long considered a rate of 5.6% to represent “full employment”; when it’s lower, anyone seeking work is assumed to be simply transitioning to a new job. The Fed revised its full-employment estimate down to 4.6% last year, by far the lowest ever, but with unemployment now well below even

▲ LETTERING BY **JOEL HOLLAND**

that, relatively few people seeking a job are unable to find one.

And that's in the economy overall. Among knowledge workers, managers, and other businesspeople, unemployment is far lower. For workers with a bachelor's degree or more, the rate is just 2.1%. In management occupations it's 2%, and within that category, unemployment in "business and financial occupations" as measured by the Bureau of Labor Statistics, is a near-invisible 1.7%, equaling the lowest unemployment rate among all job classifications economywide. "Right now the job market for professional, leadership, and new technology jobs is white hot," says Josh Bersin, a principal at Deloitte Consulting and a longtime HR thought leader. For businesspeople looking to jump, now is a long-awaited chance to find a better employer and maybe notch a substantial raise.

As for the latter, even that seems to be changing in the new job market. In private industry, says the Bureau of Labor Statistics, wages and salaries rose at 2.6% for the 12 months ended September 2017—20 basis points above the rate the prior year and notably higher than what we saw in the first half of the decade. That recent upswing is just a start, however. Economists widely expect that pay will continue rising across the U.S. in 2018—and likely accelerate for management roles and other professional fields. Compensation, indeed, is already rising smartly in cities where unemployment rates have plunged as low as they are in business occupations. In Minneapolis, for example, where unemployment was recently 2.3%, pay is rising at a 4% annual clip.

Here, as with much else in business, the tech sector has blazed a trail that's likely to wind across the corporate realm. Google once offered a staff engineer $3.5 million of restricted stock to turn down an offer from Facebook, TechCrunch reported. (The engineer took the deal.) No, the fights over top candidates won't grow quite so fevered in other industries, but a tussle for talent there will be.

And employers are taking unusual steps to attract recruits. Some are relaxing their zero-tolerance drug policy because they're "desperate to fill open positions," the Society for Human Resource Management (SHRM) has found. Workers in safety-critical jobs will still be tested, and some, such as airline pilots and truck drivers, are governed by federal rules. While evidence is anecdotal, some employers seem set to continue drug testing all applicants and taking a hard line on use of opioids, methamphetamine, and cocaine. But barring marijuana use eliminates a lot of applicants. With 30 states and the District of Columbia having broadly legalized marijuana in some form, at least a few employers are reportedly treating it like alcohol: Don't show up impaired or get that way on the job, and you're fine.

EMPLOYERS ARE OPENING the door wider in another surprising way. They're not demanding the same educational degrees that they used to. "The reality for many positions, across most organizations, is that education has no influence on actual performance," Tim Sackett, head of the HRU

HOW TO GET ON A HEADHUNTER'S RADAR

Headhunters, especially those at the most elite firms—Spencer Stuart, Heidrick & Struggles, Egon Zehnder, and Korn Ferry—may seem as mystical (and unapproachable) as they are often powerful. So how do you get their attention? That's just what we asked them. Here, some smart advice.

→ **Look at the website and find consultants who seem relevant to your goals,** then send each one a note (physical or digital) describing what you're looking for and where. If you don't get a response, it may be because you haven't reached the right consultant. Make each message personal; even the top firms get letters and emails that begin, "Dear Recruiter…"

→ **Be realistic.** The major firms tend to search for public company CEOs, directors, and other top executives. Are you really ready for such a job? "We're inundated with inquiries, many from people who are completely off the mark," says Alexis Stiles, a Spencer Stuart consultant. "Hyperbole has a place in life," adds her colleague Jason Baumgarten, "but not in this letter. Show it to a friend first."

→ **"Amplify your failures rather than sweep them under the carpet,"** says Egon Zehnder CEO Rajeev Vasudeva. "Today if you're not failing, it's unlikely you're going to be very successful."

→ **Be an emotionally connected leader.** "A lot of work we do is sourcing—talking to leaders about other leaders," says Vasudeva. "If people are talking about you as someone who is investing in other people, you can be sure you'll be getting a call from us."

Technical Resources staffing firm, recently told SHRM members. He believes HR managers are "lazy" and use educational attainment as an easy filter for an excess of applicants. But now that applicants for many positions are sparse, employers will have to look harder. His message to HR managers: "In 2018, you'll hire people you never would have hired in 2008."

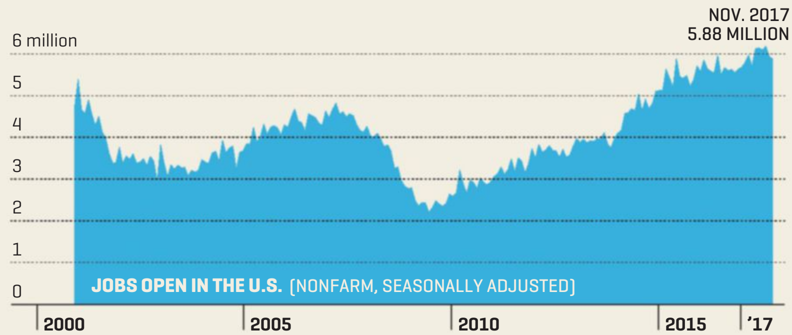
Sackett is raising a major question for job hunters. As employers are forced to confront what really makes employees successful today, what skills and traits are they seeking in candidates? This may be a great environment in which to find a new job, but you'll likely still face competition. On what basis will you be judged?

One of the qualities employers most value now is called grit—the fortitude, insight, and ability to adapt on the fly that often comes from overcoming adversity or disadvantage in life, as Ellen McGirt explains in the following feature (see page 54).

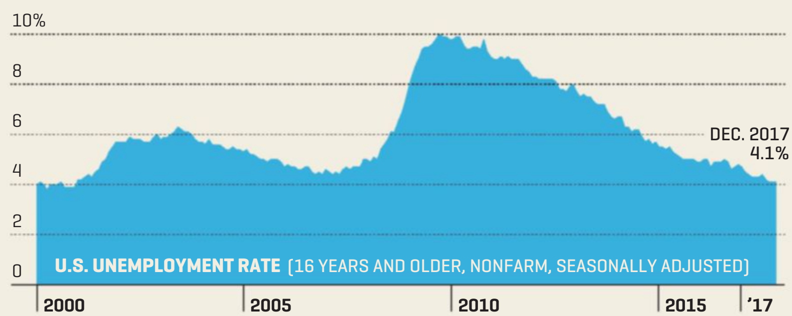
Another hot word is "potential." It isn't as obvious as it sounds. Our résumé-based model of evaluating job candidates assumes that what you'll be doing in your next job is at least broadly similar to what you did in your last one. But employers increasingly find that in a continually disrupted business environment, what you'll be doing next bears little relation to anything you've done before. With today's employees, as with mutual funds, "past performance is not the best indicator of future success," says Rajeev Vasudeva, CEO of the Egon Zehnder executive recruiting firm. "Clients want somebody with a great track record, but that may not predict a great future."

JOBS, JOBS, EVERYWHERE

Companies today have some 6 million openings they're looking to fill...

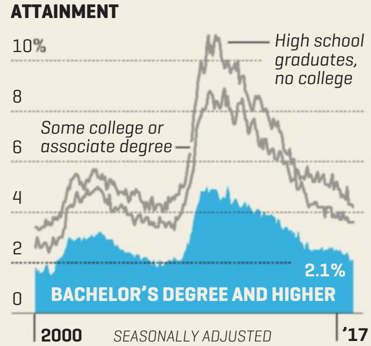


...even as fewer Americans are actively looking for work. That has created a job market that's more robust than it has been in ages...



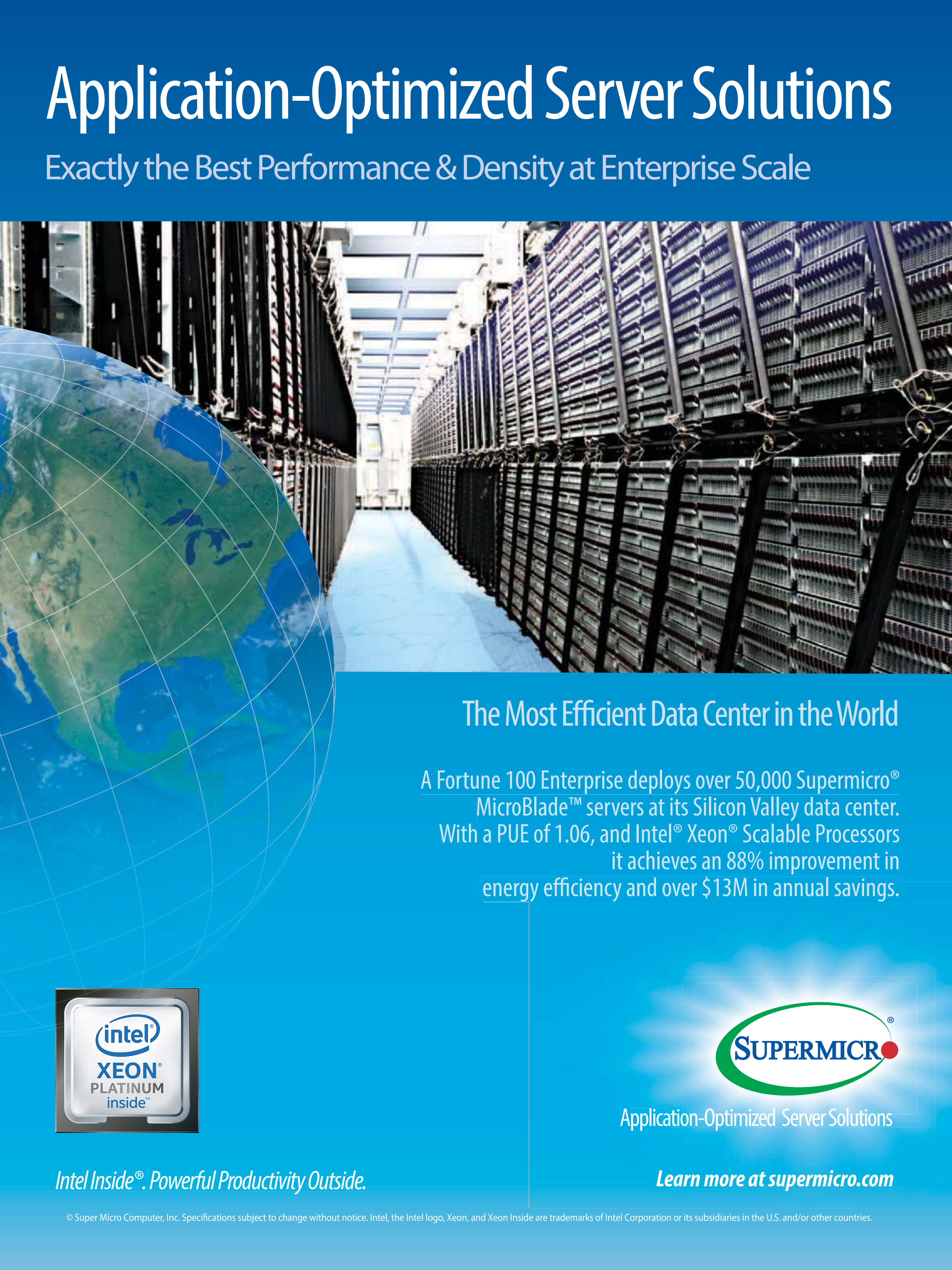
...especially for those with more education and key skill sets for the digital age. Job-seekers in corporate management roles are also in the sweet spot now.

UNEMPLOYMENT LEVEL BY EDUCATIONAL ATTAINMENT



UNEMPLOYMENT LEVEL BY OCCUPATION

SOURCE: BUREAU OF LABOR STATISTICS


Application-Optimized Server Solutions
Exactly the Best Performance & Density at Enterprise Scale
The Most Efficient Data Center in the World
A Fortune 100 Enterprise deploys over 50,000 Supermicro® MicroBlade™ servers at its Silicon Valley data center. With a PUE of 1.06, and Intel® Xeon® Scalable Processors it achieves an 88% improvement in energy efficiency and over $13M in annual savings.
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HOW CAN AN EMPLOYER identify candidates who really do have a great future? Step 1 is by abandoning the résumé as currently conceived, says Jennifer Carpenter, Accenture's global head of recruiting. "Résumés are screening out exceptional people," she says, because most résumés don't tell employers what they need to know—information about creativity, willingness to work hard, and love of learning. "That's what is most important when we're trying to evaluate potential."

Vasudeva says Egon Zehnder has done considerable work to identify markers of potential. The most significant is "curiosity—openness to learn, to new ideas." Also crucial are "capability to adapt, to deal with constant disruption and chaos." Overlaying all those abilities: "willingness to learn about yourself, openness to feedback and to adapting yourself." These factors combine to signal potential, which has become the crucial variable in top-level people decisions, Vasudeva says. "A company may have two candidates in the same ballpark, but the defining element is potential."

Résumés probably won't disappear anytime soon, so yours will somehow need to convey those traits and abilities.

Other in-demand qualities are more specific. We hear every day that digital skills are highly valued, and it's certainly true—but the market for those skills extends far beyond software makers and dotcoms. Every company is a technology company now, which means that in every kind of business, candidates with digital skills will increasingly get the best jobs.

For example, the Robert Half staffing firm has identified the hottest jobs in the creative and marketing fields for 2018. The top five? Content strategist, digital marketing manager, digital project manager, digital strategist, and marketing analytics manager.

You'll see the same trend in job postings at Glassdoor.com over the past five years. The industry with the sharpest increase in software jobs listed on the site isn't the computer biz, but rather retailing. The takeaway for job seekers is unmistakable: Every industry is digital, and every gig requires some of that expertise.

Even more valuable than digital skills, though, are digital skills combined with something larger. "When it comes to technical and digital skills, people can be put into two buckets," says Rich Kramer, CEO of Goodyear Tire & Rubber. "There are people with pure tech skills—for example, how to go direct to consumers. And then there are individuals who can think through new business models: that is, how we're going to use technology to create value, know who our customer is and what problem we're solving. That's really hard. But we have to understand that before we start writing code."

It's the difference between people who can figure out how customers can text pickup requests to a taxi company and people who can conceive of an Uber or a Lyft. "Google may have a lot of those people, but incumbent or mid-market companies may have only five or 10, and they make a disproportionate income," says Kramer. "They really make the difference."

One more theme comes through strongly in canvassing a wide range of job market authorities,

HOW TO ASK FOR YOUR NEXT BIG RAISE

Even if you love your employer and want to stay put, you may still be able to use today's hot job market to increase your pay. Advice from employment experts:

→ **Remember your negotiating advantage** in today's environment: that replacing you will be difficult and expensive. But...don't explicitly threaten to leave unless you've got a great offer in your pocket and are prepared to go. Be confident—but not aggressive: While your boss may reluctantly beat the competing offer, your relationship may be forever poisoned. Promotions and leadership development opportunities may evaporate in the end.

→ **Arm yourself.** Document the achievements that you believe merit greater pay, or show that you've successfully taken on greater responsibilities. Also research the going rate for your job in your location. Check the annual Robert Half Salary Guides by industry or use market pay calculators at Indeed.com, Glassdoor.com, PayScale.com, Monster.com, and other sites, all available free.

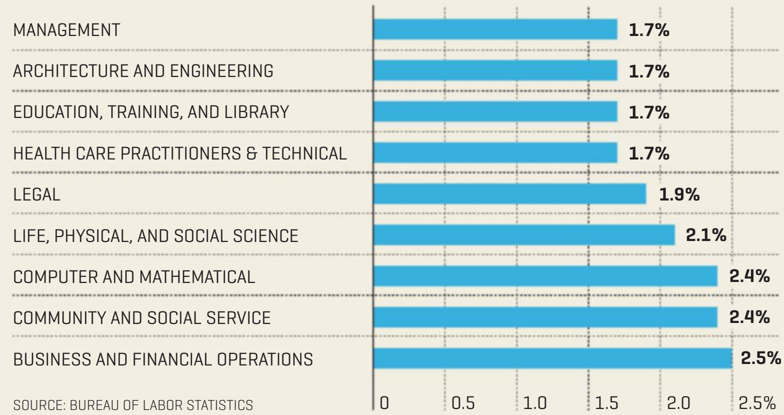
→ **When scheduling the meeting** with your boss, make clear that you'll want to discuss pay.

→ **After making your case,** ask for a specific dollar amount or percentage increase.

→ **If the answer is no,** think of what else you'd like besides money—more vacation, more training, more flexibility in where and when you work. And ask what it would take to turn the no into a yes in, say, six months.

SELLERS' MARKET: NINE HOT OCCUPATIONS

OCCUPATIONS WITH LESS THAN 3% UNEMPLOYMENT, AS OF DECEMBER 2017



SOURCE: BUREAU OF LABOR STATISTICS

a trend more profound than the others. "The whole human side is now more important than skills or IQ," says Vasudeva of Egon Zehnder. "Everything we hear from clients is about the human aspects of leadership: vulnerability, humility." Across industries, employers are prizing people skills, the so-called soft skills, more highly than before. Even in strictly defined technology jobs, employers are increasingly looking for "soft skills and leadership abilities," says the Robert Half firm, adding that "many employers now view these skills as requirements for some IT roles."

The objectives of those human skills in companies today are clear. One is "making people feel they're part of an organization that matters," says Jason Baumgarten, a search consultant at Spencer Stuart. That's because today's best candidates "want to make a difference. They're very purpose-driven," says Intuit's Whiteley, an observation widely echoed. Another objective is "building an emotional connection" with followers, says Vasudeva, citing a recent study of 500 CEOs worldwide that his firm conducted. Without that, followers won't follow. As Baumgarten puts it, "Today people work for you because they want to, not because they have to."

MAYBE THE DEEPEST PART of that emotional connection is showing employees that the leader genuinely cares about them. It may sound hopelessly warm and fuzzy, but those in the thick of hiring and evaluating leaders agree that it's important, and it's what employers are demanding. As Goodyear's Kramer says, he needs leaders "who can let you know that someone is looking out for you."

Many companies are thus coming late to a realization that dawned on Google almost a decade ago, when Laszlo Bock was running HR. "We were hiring on the wrong criteria—SAT scores, schools, majors," says Bock, who has cofounded a tech firm called Humu to help leaders, managers, and other employees be more productive and happier. "We did a three-year study proving those were not predictive of job performance." What predicted a leader's success far better than tech skills or test scores, they found, was simply making a human connection with followers, being interested in their lives and careers, and being accessible to them. Employees were happier, more productive, and less likely to leave.

To repeat, employers increasingly want deep human skills at all levels. Which leads to a question for the fired-up job seeker who wants to capitalize on this extraordinarily favorable environment: If you're fluent in those skills, how do you convey that fact to an interviewer? It's not as if you can put a certification on your résumé. Bock has the best answer, which stands as an overall wise job interview plan. "You can anticipate 90% of the questions you're going to get asked, so the correct strategy is to practice answering those questions over and over. When you get those questions, you can just talk without having to think too hard. Then if you have these social and emotional skills, you need to apply them in that meeting like you never applied them in your life. In 30 minutes you've got to make that person fall in love with you. That's the best way to convince an employer."

One more suggestion: Do it now. You never know how long white-hot markets are going to last.

FEEDBACK LETTERS@FORTUNE.COM

Photos: ©Stuart Isett/Fortune Most Powerful Women Summit

Fortune Most Powerful Women Summit, held in Washington, convened the world's top female leaders in business and beyond. Thank you to the participants, speakers, and sponsors who made this event a tremendous success. **The 2018 Summit will be held at The Ritz-Carlton, Laguna Niguel, October 1–3.**

At Fortune Most Powerful Women Summit: 1. Diane von Furstenberg, Founder and Co-chairman, DVF Studio 2. Fortune's Ellen McGirt, with Home Depot Executive Vice President Ann-Marie Campbel, JP Morgan Chase Consumer Banking CEO Thasunda Duckett, and CEO of Consumer Banking and Ariel Investment President Mellody Hobson 3. The Right Honorable Justin Trudeau, Prime Minister of Canada 4. Geisha Williams, President and CEO, PG&E 5. Billie Jean King 6. Mary Barra, Chairman and CEO, General Motors 7. Indra Nooyi, Chairman and CEO, PepsiCo

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Special Report

JOB MARKET **2018**

GRIT IS THE NEW MBA

To compete in a rapidly changing world, employers need workers who are creative, resilient, and unconventional. Here's how to look beyond traditional credentials to find people with real-world potential. **By Ellen McGirt**

UNDERESTIMATED
Snubbed by a computer science professor at her dream school, Erica Joy Baker fought her way back to top engineering jobs in Silicon Valley.

▲ PHOTOGRAPHS BY **LEAH FASTEN**


I DON'T NEED A REASON!

ERICA JOY BAKER

has had a succession of dream jobs in Silicon Valley—at Google, at Slack, and now as a senior engineering manager at Patreon, a crowdfunding platform that connects artists with donor-fans. But back in the day, in 1998, she was just an 18-year-old computer geek, sitting in her dream class at her dream school, getting the stink eye from her computer science professor and trying not to cry.

The military brat from Fairbanks had been a self-taught tinkerer, whiling away adolescent hours poking around Microsoft Windows registries and prying the backs off computer cases. Her skills earned her a ticket out of Alaska, to a Florida campus just a short drive from the beach. "I was super fed up with being in a seriously cold place," she recalls.

But as one of two black students and the only black woman in an entry-level class of hundreds, Baker felt a cold shoulder and took it personally. The professor, a white man, ignored her questions, even as he engaged enthusiastically with white male students. "Every time I talked to him, he made it clear that he didn't think I should be there," she says. Her teenage brain wondered if this was a sign of things to come. "I thought, Well, maybe he's right. Maybe computer science wasn't for me."

Baker quit school after a year and went back to Alaska. But so many of the elements that hinted at her future success were hidden in plain sight—if only someone had bothered to ask about them.

Her biological dad, who grew up in Florida, had been so poor that he sometimes skipped school to sell oranges by the roadside to raise cash for food. She moved with her family three times before she was 10, but she thrived where other kids crumpled. And she had a knowledge bank about computer systems on par with any of her college classmates. Indeed, that expertise helped her land an IT internship in the University of Alaska system, where she enrolled after returning home—which soon became a real job. "I wasn't even 20, and I was making $41,000 a year, more than my [step]father," she recalls, still sounding incredulous. "And I planned to keep going."

In 2005, Baker came across a Google job ad on Craigslist; by 2006 she had been hired as an IT field tech. The ensuing years brought big wins and promotions, but also stinging setbacks, as managers waved off her contributions or ignored her concerns, giving her

▲ LETTERING BY JOEL HOLLAND

something like the professor's stink eye all over again. "I can't say for sure why, or that Google missed every opportunity with me, but they did miss most of them," Baker says.

After nine years, the sum of the fizzles and false starts led her to look elsewhere. She found better environments at Slack and Patreon, where leadership made a stronger effort to be inclusive—and where, not coincidentally, she became a key player in the exponential growth of two of the Valley's hotter startups.

Today, Baker is a board member for nonprofits that help girls and underrepresented minorities get a foothold in tech. And her journey has given her insight with profound implications for businesses. "In the tech industry, our interview processes have always been geared to finding a specific kind of person," says Baker, who has been on both sides of the interview table. "That person usually ends up being a white guy from a very specific set of schools. Like, not me." And, as she candidly tells gatherings of folks like herself: not you either. To get in the door, she says, "you have to be prepared to show them who you are."

It's not just tech: In every company, there's a tendency to cling to an ideal candidate, exemplified by the person at the top of the org chart. "If you only look for that person, you will find them," says Joelle Emerson, founder and CEO of Paradigm, a consultancy focused on making companies more inclusive. But there's a danger inherent in the self-replicating, check-the-boxes approach: Companies risk becoming homogeneous and insular, cut off from the insights and ideas they need to innovate and compete. More ominously, it's a threat to the social fabric, widening the divide between the economic elite and everybody else.

That's why growing numbers of employers and talent scouts are considering signs of potential that standard credentials don't capture—and that transcend lines

GRIT IN THE CORNER OFFICE

Complex challenges early in life helped these six executives develop skills that got them to the pinnacles of their professions.

OPRAH WINFREY
CEO, HARPO ENTERTAINMENT

THE MEDIA mogul has mined her life story—poverty, despair, and sexual abuse starting at age 9—as a source of strength to push through professional barriers, and to inspire millions to do the same. "The reason I've been able to be so financially successful is my focus has never, ever for one minute been money," she says.

URSULA BURNS
CHAIRWOMAN, VEON; FORMER CEO, XEROX

HER FAMILY was so poor that her single mother traded office cleaning for health care. But Burns' early aptitude for math won her a scholarship and an internship at Xerox, where she would compete her way to the top. "I'm a black lady from the Lower East Side," she says. "Not a lot intimidates me."

HOWARD SCHULTZ
EXECUTIVE CHAIRMAN, STARBUCKS

SCHULTZ grew up in public housing in Brooklyn, surrounded by poverty, and was the first in his family to go to college (on a football scholarship). After training in sales, he launched the company that would later buy Starbucks. "In the course of the year I spent trying to raise money, I spoke to 242 people, and 217 of them said no," he says.

SEAN COMBS
CEO, SEAN JOHN

COMBS launched a generation of hip-hop talent and made a lasting imprint in fashion. But his story could have turned out much differently: His drug dealer father was killed when he was 3. "It made me work even harder," he recently tweeted. "We never got to share the moments that made me a man ... but he lives in my spirit."

SATYA NADELLA
CEO, MICROSOFT

NADELLA was climbing the ranks at Microsoft when life complexity hit. Zain, the eldest of his three children with wife Anu, was born quadriplegic and visually impaired. "It has had a profound impact on how I think, lead, and relate to people," he has said, moving empathy and resilience to the forefront of his thinking.

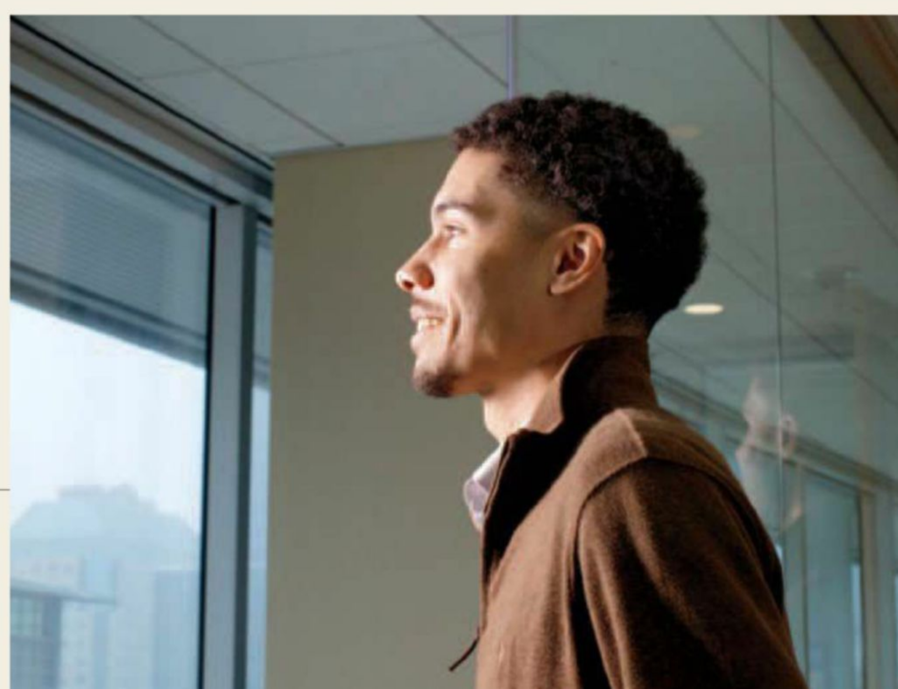
GEISHA WILLIAMS
CEO, PG&E

HER PARENTS fled Cuba when Williams (née Jimenez) was 5; by 7, she was her parents' main translator in talks with lawyers and accountants at groceries they owned in New Jersey. Mentors encouraged her early on: "I went from thinking I could be a manager to thinking I could do something much bigger," she told *Fortune*.

WINFREY: MICHAEL KOVAC—GETTY IMAGES; BURNS: ERIC PIERMONT—AFP/GETTY IMAGES; SCHULTZ: MICHAEL NAGLE—BLOOMBERG/GETTY IMAGES; COMBS: TAYLOR HILL—FILMMAGIC/GETTY IMAGES; NADELLA: SAJJAD HUSSAIN—AFP/GETTY IMAGES; WILLIAMS: DANUTA OTFINOWSKI FOR FORTUNE MOST POWERFUL WOMEN of race, income, and class. As Geoff Colvin notes in this issue (see "Ready, Set Jump!" page 44), they're increasingly skeptical of educational attainment as a proxy for performance. They're looking for accomplishments that fall outside conventional rubrics: "maker" portfolios of designs and inventions; entrepreneurial achievements; a rich volunteer life; and, more broadly, an ability to creatively manage the sometimes-difficult elements of the life they were born into. In this search, "grit," the term popularized in the 2016 bestseller of the same name by psychology professor Angela Duckworth, has become the hot shorthand. It's loosely defined as courage, perseverance, resilience, creativity, a knack for problem-solving and an openness to learning.

"I pattern-match for grit," says Arlan Hamilton, founder of Backstage Capital, an early-stage investment fund that backs black, female, and LGBTQ entrepreneurs. In her experience, grittier candidates accept feedback better, work harder, and bounce back faster from setbacks than entrepreneurs who went from prep school to the Ivy League to an MBA and beyond. Imagine a candidate who's a 40-year-old, black single mom who graduated from college while working full-time. She probably knows some things about planning, resolve, multitasking, and stretching a quarter into a dollar, Hamilton says. "And I can make a good bet that she won't give up."

Grit isn't a panacea. Unless carefully considered, the search for grit can become a check-the-box diversity exercise of its own: Without thoughtful efforts to find strong candidates and create environments that support them, it's doomed to disappoint. (It can also fuel ugly stereotypes in which success for the downtrodden depends on charity from white saviors.) That's why *Fortune* recommends a reframing: Think of grit less as an antidote to a hard-knock life and more as an ongoing quest to master *life complexity*—an experience all of us share. When recognition of that complexity shapes hiring, it opens transformative opportunities to people from groups underrepresented in top professions: ethnic minorities, stay-at-home parents, working-class kids, veterans. And



BUILDING A PIPELINE
Tony Prophet and Cindy Robbins (top) of Salesforce have teamed up with workforce development groups to find promising recruits like Marcus Stevenson (right), the first in his family to finish high school.

in a world locked in a tight global battle for talent, it helps companies find people who are resilient and creative in the face of obstacles.

"People who go to the right schools at the right time, get to know the right people and get the right interview, that's their path, and they glide over it," says Baker. The people who didn't have access to that path? "Maybe their life looks slanted, or diagonal, or they had to double back, but they got to that same place. You know what? Those are the people who succeed."

COMPANIES struggle to find such candidates in part because of bad-habit shortcuts. "If you said everyone at Salesforce had to have a computer science degree from [the same] five schools, the talent pool would be super-shallow," says Tony Prophet, chief equality officer at Salesforce, whose job involves combating that reflex. Referrals, similarly, often fail to deliver. Ask a roomful of high-achieving, top-college graduates to find potential new coworkers, and they'll likely deliver a binder full of candidates who look like themselves.

"What we hear often from companies is that people of color aren't applying," says Mimi Fox Melton, director of community mobilization for Code2040, a nonprofit focused on developing black and Latinx leadership in tech. "They have to learn to make a distinction between 'there aren't any black people,' and 'we don't know any black people.'" And odds are those same decision-makers don't know any single moms, or poor kids from rural counties.

New tactics, like recruiting from community colleges and workforce development programs, are widening the applicant pool. But they won't help the next gritty executive-in-the-rough make it past the first interview. The trick, for employers, is to normalize the notion that business acumen doesn't always come in the same forms. Decision-makers need to think differently about everything from the science of résumé-reading to the fine art of conversation.

Much of the fight for inclusive hiring has focused on battling preconceptions that prevent interesting candidates from getting in the door. Training about implicit bias, the way stereotypes unconsciously affect our choices, is becoming the norm at larger companies. Employers are also attacking bias by making people disappear—hiding applicants' identities with résumé screens, or using anonymized third-party assessment platforms to eliminate the chance that interviewers will show unintentional favoritism while, say, reviewing an applicant's sample code.

Once you reach the face-to-face stage, retooling the interview process can help nontraditional candidates, says Paradigm's Emerson. Make sure that candidates meet a diverse panel of interviewers who deliver a uniform experience to everyone. Give them questions they can reflect on ahead of time, to help them think more deeply about how their experiences might dovetail with a company's needs. "Interviews don't have to be quiz-

HOW YOUR COMPANY CAN HIRE FOR GRIT

Finding talent has never been a bigger priority. Here's how to look past preconceptions and connect with unconventional candidates.

→ **Stay open and curious.** Hiring managers and interviewers can be prone to fixating on familiar keywords (schools, job titles, references) on résumés, overreacting to their presence or absence. "Remember that the person sitting in front of you is a stranger, no matter what their résumé does or doesn't say," says Carla J. Ogunrinde, chair of the Information Technology Senior Management Forum, an organization dedicated to advancing black professionals in tech. "You don't know them. If you begin at that entry point, then curiosity is the only natural next step."

→ **Let them try you on for size.** Many companies give life-complexity candidates room to prove themselves by letting them audition for jobs, rather than just applying. "We let people come and sit side by side with us while we work on a real challenge," says Briana van Strijp, head of people and culture for Anthemis, an investment and advisory fund focusing on digital financial services. Since collaboration is a key value, "it leads to richer interactions and actual conversations."

→ **Share your own story.** For applicants without elite educational backgrounds, interviews can be daunting. Opening up about your own life story can put an interviewee at ease, establishing rapport and trust. "Everyone has a story, everyone has stumbled, and everyone has succeeded," says Salesforce's Tony Prophet. Strategic disclosure can be disarming and lead to better conversations—giving the candidates a chance to describe the strengths they're bringing to you. "It's part of being an authentic leader," he notes.

zes," says Emerson.

And there are creative ways to get to know the real person lurking behind a meager LinkedIn page. Mary Beth Wynn, head of people for Jellyvision, a benefits software maker, says her company de-emphasizes résumés in favor of the cover letter, which she says is "an opportunity to explain why, if their résumé doesn't look like a fit for the job, they actually are." Promising candidates are brought in for "auditions," joining a team for a day to do real work. One applicant, who worked as a nanny, applied for a recruiter job. The audition included, ironically, scanning résumés and cover letters, as well as designing interview questions. She killed it. It turned out her nanny client also owned a small business, Wynn explains; her uncredited experience as the client's multitasking personal assistant prepared her nicely for the job she was ultimately hired for.

Such workarounds can go only so far, of course. Melton, of Code2040, describes an episode at one tech firm: When reporting how a subject fared during a technical skills assessment, the interviewer noted on the applicant's file, "He's not qualified, he's really 'street.'" Melton says reactions like this are "incredibly common," a racist dismissal based on "culture fit." Such reactions reflect entrenched corporate biases—and squander opportunities for employers to connect with people who may well have the tools to do the job.

"None of this is rocket science," says Porter Braswell, cofounder of Jopwell, an online job platform that connects students and young professionals of color to big employers. "If you're from the majority culture, and you're trying to hire someone different from you, you need to have a human-type conversation," he says. On a practical level, that means looking up from a skimpy résumé and seeing possibility, being open to how an applicant's experiences are signposts of strength. It's crucial to "get those stories out," he says, because "if they have achieved success in their world, you should be able to figure out how they can achieve success in yours."

THERE WERE TIMES when just getting through high school felt like an unattainable goal for Marcus Stevenson. "Neither of my parents did," explains the Bay Area native. His life plan was an athletic career: He played basketball, his great love, then switched to the gridiron, but injuries snuffed out the exhilaration. School, meanwhile, left a bad taste in his mouth. "I was lost and confused and needed a push," he says. When none came from outside, he provided it himself, making it to community college, where he earned an associate degree in social science. Stevenson was daunted by the cost of a bachelor's degree, however, and he was working full-time at a mom-and-pop grocery store when a techie friend told him about Year Up, a rigorous workforce development program focused on urban youth.

Stevenson got in and took a full load of technical and professional-skills classes; he also became

THE PROFESSIONS WHERE GRIT MATTERS MOST

Exhibiting grit means working through setbacks, learning from mistakes, tolerating disappointment, and hanging in for the long haul. Those traits matter in every job, of course, but here are four where they're particularly big difference-makers:

→ **Sales** If you're in it for the steak knives, you've already lost. But through insights gleaned from the field, resilient sales professionals can build bridges between designers, marketers, and decision-makers to improve the product and grow the customer base. None of it involves sizzle; all of it involves hearing a thousand times "no."

→ **Manufacturing** Modern manufacturing isn't your grandfather's rote assembly-line work; it's an iterative process with extraordinarily high stakes. Nearly every machine that touches the world, from cars to pacemakers, energy turbines to farm equipment, is or is about to be connected to the Internet. The rapid cycle of learning required for those who put it together is profound, and product failure is not an option.

→ **Software Development** Technologists like to talk about prototyping and iteration, but few talk about the pain of being wrong a hundred times before a product is ready to ship. While certain software can be safely updated in the marketplace, not everything lends itself to patching in public. Think cybersecurity software, or the robot next to you.

→ **Public Service** Nothing says long-term disappointment quite like public service, as exemplified by the quiet lives of subject-matter experts, researchers, scientists, urban planners, diplomats, and other true believers who continue the hard work of building and saving the world long after candidates' speeches have been forgotten.

FUTURE BOSS LADY
The skills that Nelly Zorrilla developed at her mother's nail salon in the Bronx helped prepare her to work at accounting giant EY.

president of the local Toastmasters public-speaking group. "It was one of the greatest, hardest experiences of my life," he says. His performance earned him an invitation to a Salesforce networking event, where, amid canapés and chit-chat, he "got [his] smile on" and introduced himself to Prophet, the equality officer. Stevenson's story of disappointment and determination won Prophet over—the 23-year-old was a case study in life complexity, with strengths a résumé would only hint at. "He put himself on a different path and wanted to be a role model," says Prophet. Today that path runs through Salesforce, where Stevenson works for Prophet as a program coordinator—and recently showed his poise by leading a panel discussion in front of the Congressional Black Caucus.

Workforce development groups like Year Up are crucial to bridging gaps between grit candidates and *Fortune* 500 companies. While such organizations have been around for generations, new ones are sprouting rapidly, especially in tech, where the demand for flexible, resilient talent grows by the hour. Salesforce's experiences with Year Up encouraged the company to partner with Deloitte on a pilot program called Pathfinder, in Indiana, home of Salesforce's second-biggest hub. Pathfinder prepares nontraditional candidates—including "opportunity youth" (people between ages 16 and 24 who are neither in school nor working), veterans, and stay-at-home parents returning to work—for careers in software development and data management, with leadership development and professional skills training included. It's designed to train people who have the drive but not the credentials to get through a traditional résumé screen, helping them reach the next level.

Other companies, meanwhile, are integrating the hunt for life complexity in their talent searches. Ken Bouyer, Americas director of inclusiveness recruiting for consultancy EY, crisscrosses the country to visit undergrad and graduate business schools, aiming to make accounting more attractive to students of color. Promising students with a 3.5 GPA or better are invited to apply to EY's Launch internship program. Something in Bouyer's universe is working: In fiscal 2017, ethnic minorities made up 39% of EY's roughly 9,200 entry-level hires and 41% of its intern hires. Bouyer himself started as an EY intern—and stayed 27 years. On his campus visits, he starts conversations in which he shares his own grit. "I've been working since I was 12 years

PHOTOGRAPH BY **PATRICK JAMES MILLER**

old, commuted to high school an hour and a half each way, doing my homework on the bus," says the Queens native. "I tell [students], 'Success is about the little things you do when nobody else is looking.'"

Little things helped Nelly Zorrilla earn a place at EY. Zorrilla has worked since 2016 as an assurance senior in EY's Stamford, Conn., office, where she helps clients ensure their financial reporting is accurate. For the Panamanian-American, it's just the opening act of a great career. "I pictured myself as a 'boss lady' at a young age," she says. Zorrilla is a first-generation American from a tight-knit family in the Bronx—her father did odd jobs, and her mother owns a nail salon, where Zorrilla ran the desk and booked appointments. "Sometimes I still do," she says, laughing. Zorrilla became a Launch intern while studying at Pace University in Manhattan. When it was time to interview for a move from internship to a full-time position, EY matched her with a kindred spirit, a partner named Amelia Caporale. Sacrifice, self-sufficiency, and love are in Zorrilla's operating system, and Caporale was astute enough to probe for insights about how those values shaped her work ethic and her dreams. "She asked about what motivated me, and understood how much of what I do is for my family, to thank them," recalls Zorrilla. The future boss lady was evident, "even if I didn't look the part. And she saw that. She saw me."

THE HARD THING about *really* talking—having conversations where a Nelly Zorrilla or a Marcus Stevenson can shine—is that it requires both speakers to be vulnerable, to trust each other. "It comes down to authenticity," says Prophet. "That means opening up, telling your own story, and letting people see you." And those conversations can't stop with the job offer. They're the kind of talks that Erica Joy Baker feels she was missing at Google—and the ones that forward-thinking companies are building into their management processes.

Consider Starbucks, which has pushed to diversify its huge workforce, hiring refugees and opening stores in economically neglected communities of color like Ferguson, Mo., and Jamaica, Queens. When Kevin Johnson, Starbucks' CEO since April, makes field visits to get to know his employees, he eschews interviews or presentations in favor of informal talks, over coffee, with groups of six or so. They start with a simple prompt: How did you get to Starbucks? "The most amazing stories are told, and people share very vulnerable things about their lives," Johnson says. Where they've struggled, where they've been helped, what they hope the future holds. "It's where you learn to listen with your heart." And that, he adds, "leads to empathy and compassion for others."

The dynamic flows to the bottom line, Johnson says: When employees feel more welcome, so do customers. But managers who follow his example become stronger leaders too. "You'll think about risk differently," he promises. "You will make better decisions." ■

TALKING ABOUT GRIT WHEN IT COUNTS

Every conversation you have with a recruiter, a sponsor, or an interviewer is an opportunity to frame your story and telegraph your strengths.

→ **Let your own light shine.** Potential employers may not feel comfortable asking or talking about family struggles or difficult experiences like foster care. But if such experiences helped you develop and display strength, resilience, or ingenuity, bring them up. "We encourage young men to look at their story through the asset prism, not the deficit prism," says Blair Taylor, former CEO of My Brother's Keeper Alliance, an organization dedicated to improving the odds for men of color. (It's now being folded into the Obama Foundation.)

→ **Ask for help.** When preparing for a hiring or advancement conversation, find a mentor to help you craft your talking points. "I'm always amazed at how few young employees of color seek out mentors or advice," says Zackarie Lemelle, former CIO of Johnson & Johnson and current executive coach. The same can be said of folks of all ages and backgrounds who haven't spent time at the most sought-after schools and workplaces. Many people in positions of authority "would gladly take the time to give you this type of feedback," says Lemelle. "And they know how things work."

→ **Craft a story that people can share.** It helps to shape your talking points into a narrative, with a beginning, middle, and end that an interviewer can remember and repeat. "Some of the most important conversations happen when the candidate is not in the room," says Kailei Carr, director of the Emerge Academy, a women's leadership-development program. "It's critical that people with political clout and influence understand you well enough to be able to advocate on your behalf."

BUSINESS THRIVES
AT THE INTERSECTION OF THE CLOUD AND THE IOT

With the coming explosion of IoT data, organizations see the advantages of cloud-based, real-time data analytics.

CLOUD SERVICES AND THE INTERNET OF THINGS (IoT) represent two discrete technologies. Yet in many ways they overlap, complementing each other and extending their respective capabilities. The cloud provides the services and networking necessary to facilitate the flow of information, while the IoT generates enormous amounts of data through on-premise or remote sensors that function like mini-computers.

This intelligent device network is projected to become the engine that will automate everything from consumer smarthomes and autonomous vehicles to commercial robotics in heavy industries and health care delivery. In general, deploying simple on-premise or remote IoT sensors is relatively easy for most organizations. But when they decide to undertake complex end-to-end IoT initiatives, a number of challenges arise that only the cloud can alleviate.

For example, the high cost and complexity of back-end hardware and networking can strain an organization's IT resources, with spikes in IoT traffic often overwhelming on-premise infrastructure. If a company does have sufficient hardware and networking in place, however, periods of minimal data flow can result in idle equipment, wasted resources, and unnecessary costs. Pay-as-you-go cloud services enable organizations to maintain a steady state in terms of resources.

According to the Cisco Global Cloud Index (GCI), by 2019, IoT-generated data will be 49 times higher than all data center traffic.

And that's especially important as the growth of IoT data is projected to skyrocket in the not-so-distant future. According to the Cisco® Global Cloud Index (GCI), data created by IoT devices will be 269 times higher than the amount of data transmitted to data centers from end-user devices (i.e., smartphones, tablets, laptops), and by 2019, IoT-generated data will be 49 times higher than all data center traffic.*

As a result, organizations are turning to cloud-based, real-time data analytics platforms to quickly gain actionable insights from increasingly large pools of information. "More and more analytics need to be real-time in digital business, to enable new ways of engaging customers and new business models," says Dale Skeen, CTO and Co-Founder of Vitria Technology. "Companies require a platform where data changes can propagate immediately throughout the analytics value chain, enabling the right action at the right time."

The complexity of the IoT combined with high expectations created by mobile and 24/7 IT environments is a challenge that Vitria has embraced as a market leader in IoT analytics. The company provides an integrated real-time analytics platform and the necessary support, services, and tools to address the growing market for operational and IoT analytics.

"The sheer volume and the real-time nature of IoT data are daunting challenges," says Skeen. "With Vitria, companies can get started quickly, rapidly experiment, and evolve. This empowers companies to build out, step by step, their analytics value chain, which becomes a strategic digital asset of the analytics-driven business."

* SOURCE: CISCO GLOBAL CLOUD INDEX: FORECAST AND METHODOLOGY, 2015–2020

VIA BY VITRIA

CLOSING THE GAP BETWEEN TECHNOLOGY PROMISE AND REAL-LIFE SOLUTIONS

TECHNOLOGY IS FUELING THE NEXT WAVE OF INNOVATION, helping companies across all industries—from heavy industry and manufacturing to retail, communications, and services—quickly respond to new-world business demands. In the face of ongoing transformation, businesses can harness the scalability and computing power of the cloud, real-time analytics, and sensor data from Internet of Things (IoT) devices to derive highly accurate, comprehensive business insights.

Business operations today play a critical role in leveraging this information to boost productivity, improve services, predict revenues, and provide exceptional customer service. But, until recently, they have had limited visibility and insights, relying solely on historic patterns to make future predictions.

"The availability of new sources of data, coupled with the ability to analyze and act in real time, is putting operations at the forefront of digital business. The biggest pool of IoT data, or the most accurate AI algorithms will have limited value if not embedded in real-time operations," according to JoMei Chang, CEO and Co-Founder of Vitria Technology. "Making use of analytic insight to drive action during everyday operations is the key to improving business outcomes."

Companies have historically lacked the ability to quickly turn insights into action. With real-time visibility and advanced analytics, however, businesses can optimize their operations on the fly. Whether it's increasing revenue by improving supply chain efficiency, improving the customer experience through self-healing networks, or increasing manufacturing yields through predictive maintenance, real-time data analytics is the key to accelerating innovation.

VIA by Vitria offers the duality of a complete analytics solution combined with a comprehensive analytics platform. By transforming data from various sources into real-time actions, VIA empowers business operations and line-of-business (LoB) users to realize real-time analytics value within days, not months. It also provides the agility to innovate and accommodate changing business demands.

"At Vitria, we believe rapid experimentation fuels innovation," says Dale Skeen, CTO and Co-Founder of Vitria Technology. "Nothing accelerates innovation faster than empowering both citizen analysts to explore and citizen developers to craft new analytic solutions."

By providing the ability to initiate analytics projects quickly and at scale, VIA closes the gap between technology promise and real-life solutions.

"Making use of analytic insight to drive action during everyday operations is the key to improving business outcomes."

"As companies navigate the complex road to digitalization they seek a fast and agile route," adds Skeen. "VIA empowers the analytics-driven business with agile analytics to achieve business certainty."

Businesses rely on operations. Operations rely on VIA. Top businesses across industries—such as telecom operators O2 and Ericsson, and retail chain Starbucks—choose VIA to boost business efficiency and make their operations smarter.

VITRIA®

VIA by Vitria empowers business to analyze faster, act smarter, and innovate rapidly.
LEARN MORE: **VITRIA.COM/CLOUD-OF-THINGS**

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FORTUNE
WORLD'S MOST
ADMIRED
COMPANIES® 2018

THE WORLD'S MOST ADMIRED COMPANIES

▸ **WHICH ONES ARE MOST RESPECTED?** WE POLLED SOME 3,900 EXECUTIVES, ANALYSTS, DIRECTORS, AND EXPERTS TO FIND OUT. HERE ARE THE RESULTS.

EVERYONE LOOKS UP TO APPLE. With a market value that recently sat around $900 billion, the iPhone maker is the world's most valuable company. And for the 11th year in a row, it also ranks No. 1 on *Fortune*'s annual list of corporate reputation—followed at No. 2, for a second straight year, by fellow tech giant Amazon. In less auspicious news, GE plunged from No. 7 to No. 30, as its stock plummeted 45% in 2017. But on the positive side, Adidas and Lockheed Martin made their debuts among the 50 All-Stars. Once again this year, we asked respondents to rank underrated and overrated CEOs. (And two execs made the top five in both categories.) On the overrated list? Apple CEO Tim Cook. Admired doesn't always mean loved.

▲ ILLUSTRATIONS BY **RAYMOND BIESINGER**

THE LIST 2018
THE WORLD'S MOST ADMIRED COMPANIES

MOST UNDERRATED CEOs

BASED ON 2,270 RESPONSES

Satya Nadella
▶ MICROSOFT
185 VOTES

Jeff Bezos
▶ AMAZON
145 VOTES

▸ THE 50 ALL-STARS

THIS ELITE GROUP WON VOTES FROM INSIDE AND OUTSIDE THEIR OWN INDUSTRIES.

1	Apple	[Prior year: 1]	26	Walmart	[42]
2	Amazon	[2]	27	Goldman Sachs Group	[27]
3	Alphabet	[6]	28	Nordstrom	[18]
4	Berkshire Hathaway	[4]	29	Toyota Motor	[34]
5	Starbucks	[3]	30	General Electric	[7]
6	Walt Disney	[5]	31	Delta Air Lines	[31]
7	Microsoft	[9*]	32	Singapore Airlines	[33]
8	Southwest Airlines	[8]	33	UPS	[35]
9	FedEx	[11]	34	Procter & Gamble	[19]
10	JPMorgan Chase	[22]	35	IBM	[24]
11	Netflix	[14]	36	Exxon Mobil	[40]
12	Facebook	[9*]	37	McDonald's	[48]
13	Costco Wholesale	[15]	38	Target	[44]
14	American Express	[17]	39	CVS Health	[45]
15	Salesforce	[20]	40	Accenture	[41]
16	Nike	[12]	41	PepsiCo	[39]
17	Johnson & Johnson	[13]	42	Adidas	[—]
18	Coca-Cola	[16]	43	Caterpillar	[47]
19	BMW	[21]	44	Unilever	[38]
20	USAA	[25*]	45	Intel	[46]
21	3M	[23]	46	Visa	[49]
22	Home Depot	[32]	47	Nestlé	[36]
23	BlackRock	[29]	48	Lockheed Martin	[—]
24	Marriott International	[25*]	49	AT&T	[37]
25	Boeing	[30]	50	Charles Schwab	[—]

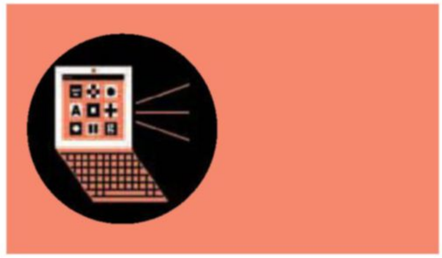
▸ THE 50 ALL-STARS BY CATEGORY

- COMPUTERS AND COMMUNICATION
- CONSUMER PRODUCTS
- CONTRACTED SERVICES
- FINANCIALS
- MEDIA AND ENTERTAINMENT
- NATURAL RESOURCES
- POWER
- PRECISION
- SHELTER
- STORES AND DISTRIBUTORS
- TRANSPORT

INDUSTRY STAND

THE MOST REPUTABLE COMPANIES, AS RANKED BY

COMPUTERS AND COMMUNICATION



COMPUTER SOFTWARE

1. **Microsoft** [1]
2. Salesforce [3]
3. Adobe Systems [2]
4. Red Hat [—]
5. SAP [5]
6. Intuit [4]
7. Oracle [8]

COMPUTERS

1. **Apple** [—]
2. Dell Technologies [—]
3. Xerox[1] [14]
4. Canon [—]
5. HP [—]
6. Fujifilm Holdings [—]
7. Asustek Computer [—]
8. Western Digital [—]

INFORMATION TECHNOLOGY SERVICES

1. **Accenture** [1]
2. IBM [2]
3. Booz Allen Hamilton Holding [3]
4. Gartner [4]
5. CACI International [9]
6. Leidos Holdings [10]
7. Cognizant Technology Solutions [5]
8. Science Applications International [7]

INTERNET SERVICES AND RETAILING

1. **Alphabet** [1]
2.* Amazon [3]
2.* Facebook [2]
4. Alibaba Group Holding [—]
5. Wayfair [—]
6. Priceline Group [4]

NETWORK AND OTHER COMMUNICATIONS EQUIPMENT

1. **Cisco Systems** [2]
2. Juniper Networks [4]
3. Motorola Solutions [9*]
4. Ciena [5]
5. Nokia [7]
6. Ericsson [6]
7. F5 Networks [—]

TELECOMMUNICATIONS

1. **AT&T** [1]
2.* Telefónica [3]
2.* Verizon Communications [2]
4. Vodafone Group [4]
5. KDDI [7]
6. Orange [10]
7. Deutsche Telekom [14]
8. América Móvil [13]

CONSUMER PRODUCTS

APPAREL

1. **Nike** [1]
2. VF [2]
3. Kering [5]
4. PVH [3]
5. Adidas [4]

BEVERAGES

1. **Diageo** [2]
2. Coca-Cola [3]
3. Anheuser-Busch InBev [1]
4. Heineken Holding [5]
5. Suntory Holdings [12*]
6. Coca-Cola Bottling [8]
7. Dr Pepper Snapple Group [6]

CONSUMER FOOD PRODUCTS

1. **Nestlé** [1]
2. PepsiCo [2]
3. Danone [3]
4. General Mills [6]
5. Mondelez International [5]
6. Land O'Lakes [7]

NOTES: *TIE IN RANK. A DASH IN PRIOR YEAR'S RANK MEANS THE COMPANY WAS NOT IN THE SURVEY LAST YEAR. DROPPED OUT OF THE TOP 50: DEERE (RANKED 50 LAST YEAR).

Elon Musk
▶ TESLA/SPACEX
96 VOTES

Jamie Dimon
▶ JPMORGAN CHASE
93 VOTES

Mary Barra
▶ GENERAL MOTORS
71 VOTES

OUTS

PEERS IN THEIR SECTOR.

FOOD PRODUCTION

1. **Tyson Foods** [1]
2. Wilmar International [4]
3. Ingredion [3]
4. Archer Daniels Midland [2]
5. Bunge [5]

HOME EQUIPMENT, FURNISHINGS

1. **Whirlpool** [3]
2. Stanley Black & Decker [5]
3. Steelcase [—]
4. Leggett & Platt [2]
5. Electrolux [7]
6. Newell Brands [6]

SOAPS AND COSMETICS

1. **Unilever** [1]
2. L'Oréal [2]
3. Colgate-Palmolive [3]
4. Henkel [6]
5. Kimberly-Clark [7]
6. Procter & Gamble [4]

CONTRACTED SERVICES

DIVERSIFIED OUTSOURCING SERVICES

1. **Robert Half International** [1]
2. ManpowerGroup [3]
3. Sodexo [2]
4. Cintas [4]
5. Aramark [5]
6. Adecco Group [7]

HEALTH CARE: INSURANCE AND MANAGED CARE

1. **UnitedHealth Group** [1]
2. Humana [3]
3. Cigna [4]
4. Aetna [2]
5. WellCare Health Plans [9]

HEALTH CARE: MEDICAL FACILITIES

1. **HCA Holdings** [1]
2. DaVita [3]
3. Fresenius [7]
4. Universal Health Services [2]
5. Kindred Healthcare [4]

HEALTH CARE: PHARMACY AND OTHER SERVICES

1. **IQVIA Holdings**[2] [3]
2. CVS Health [1]
3. Quest Diagnostics [4]
4. Cerner [2]
5. Laboratory Corp. of America [9]

FINANCIALS

CONSUMER CREDIT CARD AND RELATED SERVICES

1. **Visa** [1]
2. Mastercard [2]
3. PayPal Holdings [3]
4. American Express [4]
5. Capital One Financial [5]

FINANCIAL DATA SERVICES

1. **Thomson Reuters** [2]
2. Automatic Data Processing [1]
3. Fiserv [3]
4. Broadridge Financial Solutions [4]
5. S&P Global [7]
6. Fidelity National Information Services [6]

INSURANCE: LIFE AND HEALTH

1. **Prudential Financial** [1]
2. Massachusetts Mutual Life [5]
3. Aflac [4]
4. MetLife [7]
5. Principal Financial [8]
6. New York Life Insurance [3]
7. Northwestern Mutual [6]

INSURANCE: PROPERTY AND CASUALTY

1. **Berkshire Hathaway** [1]
2. Travelers Cos. [6]
3. USAA [2]
4. Allstate [9]
5. Chubb [—]
6. Swiss Re [4*]
7. Munich Re Group [11]
8. State Farm Insurance [3]

MEGABANKS

1. **JPMorgan Chase** [1]
2. Goldman Sachs Group [4]
3. Morgan Stanley [3]
4. Bank of America [2]
5. Royal Bank of Canada [—]
6. Wells Fargo [14]
7. HSBC Holdings [7]
8. Citigroup [6]

SECURITIES AND ASSET MANAGEMENT

1. **BlackRock** [1]
2. Charles Schwab [2]
3. T. Rowe Price [3]
4. Raymond James Financial [5]
5. Voya Financial [—]
6. Jones Financial (Edward Jones) [9]

SUPERREGIONAL BANKS

1. **U.S. Bancorp** [1]
2. PNC Financial Services Group [2]
3. Northern Trust [3]
4. BB&T Corp. [4]
5. State Street Corp. [5]
6. Bank of New York Mellon [6]

THE LIST 2018
THE WORLD'S MOST ADMIRED COMPANIES

MOST OVERRATED CEOs

BASED ON 1,575 RESPONSES

Mark Zuckerberg
▸ FACEBOOK
370 VOTES

Tim Cook
▸ APPLE
213 VOTES

▸ TOP COMPANIES BY ATTRIBUTE

INNOVATION: 1. **Amazon** 2. **Netflix** 3. **Apple** ▸ **QUALITY OF MANAGEMENT:** 1. **U.S. Bancorp** 2. **Berkshire Hathaway** 3. **Netflix**

CORPORATE ASSET USE: 1. **U.S. Bancorp** 2. **Toyota Motor** 3. **Apple** ▸ **LONG-TERM INVESTMENT VALUE:** 1. **UnitedHealth Group**

MEDIA AND ENTERTAINMENT

ENTERTAINMENT

1. Walt Disney [1]
2. Netflix [2]
3. Electronic Arts[3] [6]
4. Activision Blizzard [3]
5. Liberty Media [5]
6. Discovery Communications [4]
7. Live Nation Entertainment [8]
8. Time Warner [7]

HOTELS, CASINOS, AND RESORTS

1. Marriott International [1]
2. Hilton Worldwide Holdings [2]
3. Wynn Resorts [3]
4. MGM Resorts International [4]
5. Hyatt Hotels [5]
6. Las Vegas Sands [6]

NATURAL RESOURCES

CHEMICALS

1. BASF [6]
2. Monsanto [2]
3. Ecolab [3]
4. PPG Industries [1]
5. LyondellBasell Industries [7]
6. DowDuPont[4] [—]

METALS

1. Nucor [7]
2. Steel Dynamics [—]
3. Alcoa [—]
4. Reliance Steel & Aluminum [—]
5. ArcelorMittal [2]
6. Voestalpine [—]
7.* Nippon Steel & Sumitomo Metal [3]
7.* POSCO [6]

MINING, CRUDE-OIL PRODUCTION

1. Occidental Petroleum [—]
2. ConocoPhillips [—]
3. EOG Resources [—]
4. Devon Energy [—]
5. Apache [—]
6. Newmont Mining [—]
7.* Anadarko Petroleum [—]
7.* Anglo American [—]

PACKAGING, CONTAINERS

1. Sonoco Products [2]
2. WestRock [4]
3. International Paper [3]
4. Sealed Air [1]
5. Packaging Corp. of America [6]

PHARMACEUTICALS

1. Johnson & Johnson [1]
2. Merck [4]
3. Novartis [2*]
4. Roche Group [2*]
5. Bristol-Myers Squibb [—]
6. Amgen [5]
7. Bayer [10]
8. AbbVie [8*]

POWER

ELECTRIC AND GAS UTILITIES

1. NextEra Energy [1]
2. Dominion Energy[5] [2]
3. Sempra Energy [—]
4. Xcel Energy [4*]
5. Duke Energy [9]
6. American Electric Power [3]
7. DTE Energy [10*]
8. Edison International [12]

PRECISION

ELECTRONICS

1. Honeywell International [1]
2. Samsung Electronics [2]
3. Eaton [—]
4. TE Connectivity [—]
5. Schneider Electric [8*]
6. Sony [4]
7. LG Electronics [10]

MEDICAL PRODUCTS AND EQUIPMENT

1. Abbott Laboratories [1]
2. 3M [2]
3. Boston Scientific [6]
4. Thermo Fisher Scientific [7]
5. Stryker [5]
6. Medtronic [3]

SEMICONDUCTORS

1. Nvidia [1]
2. Taiwan Semiconductor [3]
3.* Intel [2]
3.* Texas Instruments [4]
5. Applied Materials [5]
6. Lam Research [9]
7. Micron Technology [10]
8. Qualcomm[6] [1]

Ginni Rometty
▶ IBM
153 VOTES

Jamie Dimon
▶ JPMORGAN CHASE
146 VOTES

Elon Musk
▶ TESLA/SPACEX
144 VOTES

▶ **QUALITY OF PRODUCTS:** 1. **Apple** 2. **Walt Disney** 3. **Netflix**

2. **U.S. Bancorp** 3. **Apple** ▶ **TALENT ATTRACTION:** 1. **Apple** 2. **Alphabet** 3. **Facebook**

SHELTER

ENGINEERING, CONSTRUCTION

1. EMCOR Group [2]
2. AECOM [5]
3. Fluor [1]
4. Peter Kiewit Sons' [4]
5. Jacobs Engineering Group [3]

HOMEBUILDERS

1. Toll Brothers [1]
2. CalAtlantic Group [4]
3. PulteGroup [6*]
4. Lennar [2]
5. KB Home [8]

REAL ESTATE

1. Host Hotels & Resorts [2*]
2. CBRE Group [4]
3. Simon Property Group [1]
4. Jones Lang LaSalle (JLL) [2*]
5. Ventas [6]

STORES AND DISTRIBUTORS

FOOD AND DRUGSTORES

1. Publix Super Markets [3]
2. Walgreens Boots Alliance [1]
3. Kroger [2]
4. Sprouts Farmers Market [—]
5. George Weston [8]
6. Smart & Final Stores [5]

FOOD SERVICES

1. Starbucks [1]
2. McDonald's [2]
3. Yum Brands [4]
4. Bloomin' Brands [7]
5. Panera Bread [5]

GENERAL MERCHANDISERS

1. Nordstrom [1]
2. Walmart [3]
3. Costco Wholesale[7] [2]
4. Target [2]
5. Kohl's [4]

SPECIALTY RETAILERS

1. Home Depot [4]
2. TJX [1]
3. Lowe's [5]
4. L Brands [3]
5. Penske Automotive Group [—]
6. Best Buy [8]
7. AutoNation [9]
8. CarMax [—]

WHOLESALERS: DIVERSIFIED

1. W.W. Grainger [1]
2. Graybar Electric [—]
3. WESCO International [2]
4. Genuine Parts [6*]
5. HD Supply Holdings [12]
6. VWR[8] [—]

WHOLESALERS: ELECTRONICS AND OFFICE EQUIPMENT

1. Arrow Electronics [1]
2. Tech Data [2]
3. Synnex [5]
4. ScanSource [4]

WHOLESALERS: HEALTH CARE

1. McKesson [1]
2. Henry Schein [3]
3. Cardinal Health [2]
4. AmerisourceBergen [4]

▶ NOTES

A DASH IN PRIOR YEAR'S RANK MEANS THE COMPANY WAS NOT IN THE SURVEY LAST YEAR.

*TIE IN RANK.

[1] RANK IN INFORMATION TECHNOLOGY SERVICES LAST YEAR.

[2] CHANGED NAME FROM QUINTILES IMS HOLDINGS.

[3] RANK IN COMPUTER SOFTWARE LAST YEAR.

[4] MERGER OF DOW CHEMICAL (PRIOR YEAR RANK: 9) AND DUPONT (PRIOR YEAR RANK: 4).

[5] CHANGED NAME FROM DOMINION RESOURCES.

[6] RANK IN NETWORK AND OTHER COMMUNICATIONS EQUIPMENT LAST YEAR.

[7] RANK IN SPECIALTY RETAILERS LAST YEAR.

[8] ACQUIRED BY AVANTOR.

[9] PART OF FORMER ALCOA. RANK IN METALS LAST YEAR.

[10] RANK IN ELECTRONICS LAST YEAR.

[11] RANK IN CONSTRUCTION AND FARM MACHINERY LAST YEAR.

INDUSTRY STANDOUTS

TRANSPORT

AEROSPACE AND DEFENSE

1. Boeing [5]
2. Lockheed Martin [2]
3. Northrop Grumman [1]
4. United Technologies [3]
5. Raytheon [4]
6. General Dynamics [6]
7. Airbus Group [7]
8. Arconic[9] [1]

AIRLINES

1. Delta Air Lines [1]
2. Singapore Airlines [4]
3. Southwest Airlines [7]
4. Lufthansa Group [5]
5. Air France-KLM Group [2]
6. Qantas Airways [9]
7. ANA Holdings [8]
8. Cathay Pacific Airways [3]

CONSTRUCTION AND FARM MACHINERY

1. Deere [2*]
2. Caterpillar [1]
3. Komatsu [5]
4. Oshkosh [—]
5. Paccar [4]

DELIVERY

1. UPS [1]
2. Deutsche Post DHL Group [3]
3. FedEx [2]
4. Royal Mail [4]

INDUSTRIAL MACHINERY

1. Siemens [1]
2. Emerson Electric[10] [6]
3. ABB [5]
4. Ingersoll-Rand [2]
5. Illinois Tool Works [4]
6. Cummins[11] [2*]
7. Dover [—]

MOTOR VEHICLE PARTS

1. Bosch Group [1]
2. Toyota Industries [3]
3. Lear [7]
4. Continental [5]
5. Michelin [4]
6. Goodyear Tire & Rubber [2]
7. Denso [9]
8. Magna International [11]

MOTOR VEHICLES

1. Toyota Motor [1]
2. BMW [2]
3. Daimler [4]
4. Ford Motor [5]
5. General Motors [6]
6. Honda Motor [3]
7. Volkswagen [9]
8. Nissan Motor [8]

TRUCKING, TRANSPORTATION, LOGISTICS

1. Union Pacific [1]
2. Maersk Group [—]
3. C.H. Robinson Worldwide [2]
4. XPO Logistics [7]
5. Ryder System [5]

HOW WE DETERMINE THE LIST

AS WE HAVE IN THE PAST, *Fortune* collaborated with our partner Korn Ferry on this survey of corporate reputation. We began with a universe of about 1,500 candidates: the 1,000 largest U.S. companies ranked by revenue, along with non-U.S. companies in *Fortune*'s Global 500 database that have revenues of $10 billion or more. We then winnowed the assortment to the highest-revenue companies in each industry, a total of 680 in 29 countries. The top-rated companies were picked from that pool of 680; the executives who voted work at the companies in that group.

To determine the best-regarded companies in 52 industries, Korn Ferry asked executives, directors, and analysts to rate enterprises in their own industry on nine criteria, from investment value and quality of management and products to social responsibility and ability to attract talent. A company's score must rank in the top half of its industry survey to be listed.

Results were not published in the following categories owing to insufficient response rates: Cable and Satellite Providers, Petroleum Refining, Pipelines, and U.S. Energy.

To select our 50 All-Stars, Korn Ferry asked 3,900 executives, directors, and securities analysts who had responded to the industry surveys to identify the 10 companies they admired most. They chose from a list made up of the companies that ranked in the top 25% in last year's surveys, plus those that finished in the top 20% of their industry. Anyone could vote for any company in any industry.

The difference in the voting rolls explains why some results can seem at odds with each other. For example, Deere fell off the All-Star list but moved up one notch within the construction and farm machinery category when votes from only those in that industry were counted. —*Scott DeCarlo*

KORN FERRY

▲ FOR MORE ON THE WORLD'S MOST ADMIRED COMPANIES, VISIT **FORTUNE.COM/WMAC.**

EDUCATION IN OREGON

STATE OF INNOVATION

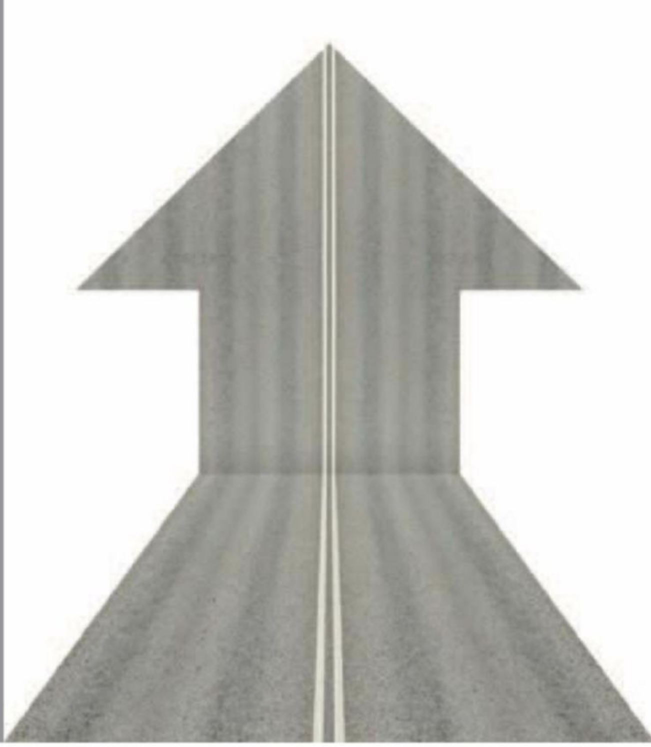
OREGON OFFERS MORE THAN JUST BOUNDLESS BEAUTY—IT'S ALSO BECOMING A LEADING DESTINATION FOR INNOVATION AND ENTREPRENEURSHIP.

WHEN YOU THINK OF OREGON, what comes to mind? For many, it's evergreen forests, diverse landscapes, and endless miles of hiking trails. But there's more to Oregon than its majestic coast and picturesque scenery. Situated between Silicon Valley and Seattle, Oregon is a hotbed for innovation. In fact, many of the colleges in the Beaver State are ramping up their graduate degree programs to accommodate the recent surge of technology and outdoors-inspired entrepreneurship.

Southern Oregon University (SOU), nestled between two mountain ranges and bounded by scenic rivers, has just launched a new program in outdoor adventure and expedition leadership. "There was a demand for a master's degree program that takes more of an entrepreneurial slant," says Joe Mosley, director of community and media relations at SOU. "It prepares people to start their own businesses in outdoor adventure fields." He expects the program to grow exponentially and believes it's one of only two master's degree programs like it west of the Mississippi.

As our world becomes more tech-infused and artificial intelligence starts to redefine the workplace, many students are seeking to find a niche and furnish their own careers. At the intersection of entrepreneurship and adventure, Western Oregon University (WOU) alumnus Larry Peterson hit a sweet spot. His company, LongBoardLarry, which crafts handmade skateboards, enabled him to turn a passion into a profession. Dr. Rex Fuller, president of WOU, cites Peterson as emblematic of students' drive to invent careers. He says he's starting to see midcareer people looking for additional educational background and leadership development. The school is exploring organizational leadership for its graduate program to satisfy those desires.

Nature can be quite the muse, inspiring many artists in their life's work. Portland, considered to be one of the country's most creative cities, is an artist's wonderland, providing a nurturing atmosphere amid



breathtaking scenery. The city, famous for its progressive views and artistic vibe, is a magnet for creative types who also love the outdoors. One of its draws is Pacific Northwest College of Art (PNCA), located right in the middle of downtown in a resplendent century-old Federal building. "We are the heart of Portland's cultural life, presenting hundreds of free public programs each year with exhibitions, performances, and lectures by visiting and local artists and cultural activists and collaborating with other arts institutions," says Mack McFarland, Director of PNCA's Center for Contemporary Art & Culture.

The future of higher education is following the trajectory of technology trends today: lots of lightning-speed progress with unexpected zigs and zags along the way. By staying abreast of these changes with its diverse and entrepreneurial education programs, Oregon is creating the next generation of leaders and fueling its transformation into a landscape for innovation. ●

AS OUR WORLD BECOMES MORE TECH-INFUSED AND ARTIFICIAL INTELLIGENCE STARTS TO REDEFINE THE WORKPLACE, **MANY STUDENTS ARE SEEKING TO FIND A NICHE AND FURNISH THEIR OWN CAREERS.**

Can These VCs Fix Tech's Bro Problem?

Aspect Ventures cofounders Theresia Gouw (left) and Jennifer Fonstad run the rare gender-balanced VC firm.

PHOTOGRAPH BY WINNI WINTERMEYER

At a time when scandal can topple even the mightiest of unicorns, the smart money is falling out of love with the bad boys of Silicon Valley. That's opened the door to a new breed of investor who is betting big on diversity.

BY MICHAL LEV-RAM

IT COULD BE JUST ANOTHER monthly partner meeting at just another "Fill in the Blank" Capital, typical Silicon Valley–based venture firm. The fund's top players sit around a white conference table, armed with Apple laptops and pastel-colored cans of La Croix. A couple of startup entrepreneurs stop by to present to the partners, enthusing over upward-trending charts and touting the merits of recent hires. Outside the expansive windows lies the not-quite-bustling heart of downtown Palo Alto—a town that, along with nearby Menlo Park and the city of San Francisco, is a mecca for Arc'teryx vest–wearing VCs.

But anyone who knows this hub of venture capital would immediately spot something unusual about this particular gathering: Four of the eight investors seated around the table are female. And one of the two presenting portfolio company heads is also a woman. In Silicon Valley, where unicorns are a dime a dozen, this kind of gender ratio is the real rare and magical discovery.

"If you have more diversity you have better financial performance," says Theresia Gouw, one-half of the founding team of Aspect Ventures, the norm-breaking VC firm at hand (the other founder is Jennifer Fonstad). "Our company is nearly 50/50 in an industry in which just 7% of investors are female. And our portfolio is a reflection of our pipeline."

Gouw and Fonstad, both longtime VCs who ▶

worked at firms like Accel and DFJ, didn't set out to create a "female-focused" fund when they launched Aspect in 2014. But they believed that diversity, both internally and throughout their portfolio companies, would lead to better outcomes—and they had the right Rolodex to test out their thesis. "We have different networks than the traditional firms on Sand Hill Road," says Fonstad, referring to the nearby street where the bulk of the most established VCs are headquartered.

The results: Over the course of their careers, Gouw and Fonstad's investments have resulted in a collective seven public offerings, 26 acquisitions, and more than 500 financing rounds in follow-on capital. Aspect, which is now announcing a second, larger fund with some big-name limited partners (more on that later), began with $150 million in financing and has already made 29 Series A investments. One of its portfolio companies, security startup ForeScout, went public last fall at a valuation of about $800 million. Other standout investments under Aspect's first fund include Cato Networks and Exabeam, both promising cybersecurity startups; health-tech player Vida Health; and online career source The Muse.

Overall, women founders receive less than 3% of total VC dollars (women of color, meanwhile, get a meager 0.2%), but Aspect's portfolio looks strikingly different from the norm:

VC by the Numbers

$84 BILLION
VC investment in startups in 2017

1 TO 14
Female to male VC investing partners

2.7%
Share of VC dollars invested in women-led startups

0.2%
Share invested in startups led by women of color

In Silicon Valley, where unicorns are everywhere, gender balance is the real rare and magical entity.

About 40% of the firm's companies were founded by women, and 30% were started by minorities. Once, those numbers might have been a mere curiosity—today they are becoming a competitive advantage. While investing for diversity is something certain industry players have been pushing for a long time, the message is finally beginning to be received by the deep-pocketed individuals and institutions that fund the Silicon Valley ecosystem. Why? Ignoring it can be expensive.

Last summer, after six female founders accused venture capitalist Justin Caldbeck of making unwanted sexual advances, his firm, Binary Capital, spiraled downward fast. Caldbeck quickly resigned from the all-male firm. A new fund, then in the process of being raised by Binary, was abruptly halted.

It's not just venture capital firms that can be impacted. Perhaps the most high-profile example of how such misconduct can destroy value is Uber, the ride-sharing company rocked by allegations of harassment and sexism early last year. A number of other embarrassing debacles followed—including reports that Uber had used a software tool to try to deceive authorities by "hiding" rides—and ultimately resulted in a 30% decrease to the once high-flying company's valuation, from around $70 billion to $48 billion.

There's no foolproof method to guarantee that a VC shop or startup will be immune to these kinds of problems, but betting on diverse leaders can give investors some peace of mind. Numerous studies have suggested that gender-balanced teams drive better business results—and, perhaps unsurprisingly, research shows that male-dominated organizations have higher levels of sexual harassment than those with more equitable gender dynamics.

None of this is lost on anyone who has a stake in Silicon Valley's success, let alone the limited partners who fund the entire ecosystem, a.k.a. the investors in the investors.

"In many ways, the venture and startup ecosystem is still a boys' club—one that all too often excludes, disadvantages, and mistreats talented women who want to contribute to it," says Melinda Gates, cochair of the Bill & Melinda Gates Foundation and an investor. "The data tells us that's harmful to society and bad for business."

Gates is one of a handful of limited partners

LUISA DORR

Philanthropist Melinda Gates, who invested in Aspect's second fund, says it's time for LPs to step up and demand change.

who have put a collective $181 million into Aspect's just-announced fund, the firm's second. Another LP is Cisco Systems, the Bay Area–based networking giant, whose financing arm invests directly in startups and in other funds. "This fiscal year was the first time that we have specifically put diversity into our [investment] planning," says Janey Hoe, a vice president with Cisco Investments. "Just like I have a plan for security and collaboration and data center, we have now put forward a plan for [investing in] diversity."

While there have long been small players in the venture capital community who defied the stats and were able to attract some LP money, they tended to be relegated to the fringes of the industry, with less access to sizable funds and the buzziest companies. Now, as Silicon Valley is finally coming to terms with the fact that bad behavior can do more than cause a temporary headache, concerned LPs are taking notice. That opens the door for funds like Aspect, which have made diversity part of their investment strategy from the get-go. The question now: Is this newish breed of VCs truly in a position to challenge the established firms that have long ruled Sand Hill Road? Or is this trend just another one of tech's passing fads?

Even with the brawn of Gates and Cisco behind it, Aspect's $181 million fund isn't all that menacing to the status quo when compared with the Valley's biggest names, many of whom raise single funds worth more than $1 billion. But if the powers behind the money start to reprioritize, we could see the balance begin to tip in the underdog's direction. If there's one thing VCs know all too well, it's that little guys sometimes put the big guys out of business.

UNTIL RECENTLY, LPs have largely stayed in the background, invisible to most who operate day to day in the tech world. But despite their often secretive nature, these wealthy individuals, offices of private family funds, or institutions hold immense power. And venture capitalists say they are starting to ask questions.

"They likely believe [claims of sexual harassment] are material information," says Mike Maples Jr., cofounder of Floodgate, a Palo Alto–based VC firm with an investing team that's 40% female. "In today's world, if partners engage in unacceptable behavior the entire firm can blow up."

Limited partners have done significant back-channel reference checking for years. But according to insiders, not only are LPs doing even more intensive vetting these days, but also the people they are talking to are now much more likely to feel a responsibility to out bad behavior. "Now there is more of a culture of people thinking, 'Hey, you should talk about these things even if they are rumors,'" says Floodgate's other cofounder, Ann Miura-Ko.

"This year and in 2017 it has definitely been a lot more top of mind for [LPs]," says Lan Xuezhao, the founding partner at Basis Set Ventures, a new, artificial intelligence–focused VC firm. The former Dropbox executive raised

The effects of bad behavior go beyond the PR headache—and LPs are taking notice.

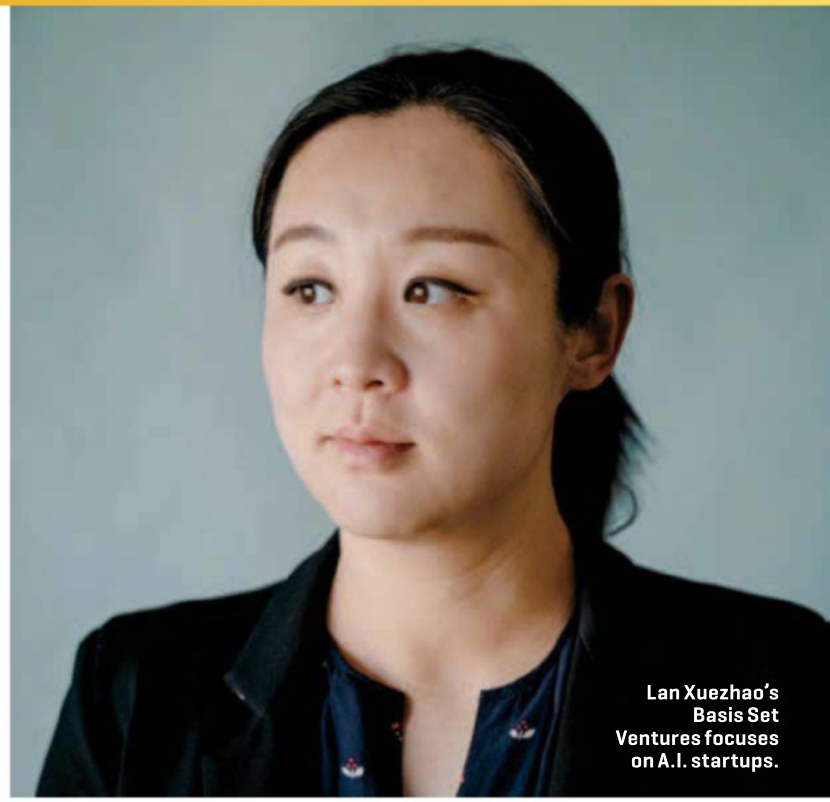
$140 million for her first fund and says that while bigger funds have a clear advantage when it comes to leading the largest deals, her dual focus—A.I. and diversity—gives her a leg up.

Even some of those larger funds appear to be feeling the pressure to diversify. In the past two years, heavyweights Benchmark and Sequoia Capital both hired their first-ever female senior partners, bringing them to 17% and 11% women, respectively.

NEA, one of the largest firms with $20 billion in assets under management, has yet to hire or promote a female general partner, though it does have six female investing partners on staff. But Dayna Grayson, one of those investing partners, says her firm does have some advantages—besides just sheer dollars—over smaller players.

"When you get to a certain scale you can have an HR body, a chief legal officer, policies and training, and a number of other levers to ensure that everybody is informed" on what is and is not acceptable in the workplace, says Grayson. So while a firm like NEA may not have a woman at the table when the big decisions are being made, there is an argument that it can afford the infrastructure needed to stem bad behavior, both at its portfolio companies and within its own ranks.

Kate Barrett, NEA's marketing partner, adds that comparing the gender ratios of large firms like hers with smaller players can be



Lan Xuezhao's Basis Set Ventures focuses on A.I. startups.

Ann Miura-Ko (above) and Mike Maples Jr., cofounders of Floodgate, say LPs are stepping up their vetting of potential investments.

misleading: It's one thing for a four-person firm to be 50% female, but quite another for a 36-person operation like NEA.

NEA maintains that questions about diversity have not impacted its fundraising. But that may well change. The firm closed its latest fund, a massive $3.3 billion, last May, just as the Valley's harassment scandals were starting to mount—but before they gained real attention from the bulk of the tech world. "We hear from our LPs during fundraising times," says Barrett.

LAST SEPTEMBER, ABOUT 200 representatives from some of the largest family funds in the country gathered at the Ritz-Carlton in San Francisco. The group comprised, as portfolio manager Kristen Koh Goldstein put it, the kind of people who are "wealthy enough they don't need to be in a listicle." But while the attendees might opt to keep their fortunes out of the press, they are putting those funds to work; everyone at the gathering was a limited partner, tasked with allocating large amounts of private, family-owned capital into various investments, including many of Silicon Valley's venture capital firms.

Goldstein, who comanages the investments of her family office, AthenaPartners, had been asked by the gathering's organizers to put together content on a topic of increasing concern to the LPs in attendance: the mounting discrimination and harassment problems in the tech world. "They realized this was an issue, but they didn't know the extent of it or what you could do about it as a limited partner," says Goldstein.

The Bay Area–based investor brought in founder Niniane Wang, who sold her startup last year and is now an engineering leader at *Pokémon Go* creator Niantic. Earlier in 2017 she was among the women who publicly accused Caldbeck, the former partner at Binary Capital, of sexual harassment.

"I gave them [the LPs] some actionable advice, like, don't sign a nondisclosure agreement as part of your investment, and ask questions about how they [the VCs] treat diversity or whether or not they have a female partner," says Wang.

According to Goldstein, Wang received a standing ovation, and both women were mobbed with questions and comments from the audience. The session was the highest rated at the event, and the organization has already asked Goldstein to come up with similar programming for future summits.

"There is an enormous risk here that some of these families weren't even aware of," says Goldstein. "Our goal was to reach these wealthy people, who sometimes have no idea they are funding misogynists, and give them practical things they can do to protect themselves."

Following the event, Goldstein has fielded several calls from high-profile family offices, asking for her take on whether there might be a misconduct or other risk with some of their potential investments; she calls these "what's the real deal here" calls.

Some LPs—ones who obviously haven't signed NDAs with the venture capital firms they've funded—aren't just using back channels to ask questions. Instead they are throwing off their usual role as silent partner and for the first time taking their concerns public.

Last summer, amidst the wave of harassment scandals, 500 Startups cofounder Dave McClure was accused of sexual misconduct. The eccentric general partner of the incubator and venture capital firm apologized and resigned from his role. In response to the revelations, some of his most high-profile LPs, including Mitch Kapor and Freada Kapor Klein, publicly expressed their outrage at his behavior—and the larger tech community's role in enabling it.

"This is a culture that has been allowed to fester and to rot by enablers who refused to intervene when they witnessed inexcusable behavior or went to great lengths to avoid seeing it," they said in a statement.

Many limited partners have signed NDAs and will probably continue to do so. And many more won't speak out even if given the opportunity. But as awareness and concern reaches critical mass, it's likely that a growing number of LPs will make their voices heard—if not with words, then with dollars. Down the road, that could have tangible impact on venture capital firms that are not evolving to meet current demands.

"I want to back the people best positioned to successfully invest in tomorrow's groundbreaking ideas," says Melinda Gates. "And they're not always the people who successfully invested in yesterday's."

Inside Aspect's Portfolio

Roughly 40% of the startups Gouw and Fonstad's firm has invested in are led by women.

BIRCHBOX
The monthly makeup-delivery service, which has over 1 million subscribers, is run by cofounder Katia Beauchamp.

GROKKER
Lorna Borenstein's healthy-living video platform has raised a collective $22.5 million.

URBANSITTER
The "OpenTable for childcare," founded by four women, has raised more than $40 million.

THE MUSE
A career finder targeted at millennials, run by cofounder and CEO Kathryn Minshew.

VIDA HEALTH
Longtime tech exec Stephanie Tilenius wants to transform health care with her preventive-care platform.

LAN: JERRY YOON; MIURA-KO AND MAPLES: CHRIS MICHEL

Beyond Healthcare: Treating the Person, Not Just the Problem

Through innovation, technology, and a dedicated workforce, **WELLCARE HEALTH PLANS** delivers coordinated, high-quality, cost-effective care and behavioral health services for "a better you."

AT A TIME OF GREAT UNCERTAINTY in American healthcare, it is reassuring to know that some companies understand the medical complexities of their customers' lives and consider extrinsic factors, such as food, housing, and education, when addressing their needs.

That approach has earned WellCare Health Plans, Inc. a coveted spot on *Fortune*'s list of the World's Most Admired Companies. The Florida-based company provides managed-care health plans—through Medicaid, Medicare Advantage, and Medicare Prescription Drug plans—for more than 4.3 million members throughout the United States. In addition, the company partners with well over 400,000 contracted providers while employing some 9,000 associates.

"WellCare delivers value and finds innovative ways to provide access to high-quality care with budget predictability."

KENNETH A. BURDICK
CEO, WellCare Health Plans

"It's a tribute to the talent and hard work of our associates across the country," CEO Kenneth A. Burdick says of the recognition. "It's also proof that our model works."

WellCare's integrated model of care addresses the overall health of the individual person. It is a holistic approach "beyond healthcare"—part of the company's brand tagline—to get its members on the path to "a better you." To achieve this, the company initiated a data-driven process to assess high-risk members, as well as those with complex medical problems, and provide them with additional personalized care, such as face-to-face meetings and telephone check-ins with WellCare's case managers.

The company has also integrated behavioral health services into its model with programs to help identify risk for conditions that include substance abuse, then connect identified members with the level of care they need. The approach works: A pilot program in Kentucky last year resulted in a 50% reduction in opioid dispensing among at-risk members.

Driving innovative programs and initiatives at WellCare comes from within the organization, where the best ideas are gathered from frontline associates and implemented across the company's markets. That degree of talent integration in a formal innovation process is the key to WellCare's ongoing success.

"Healthcare is a continuously evolving environment," says Burdick. "For our state and federal partners, providing quality healthcare is often one of the most expensive line items in their budgets. That's where WellCare delivers value and finds innovative ways to provide access to high-quality care with budget predictability." ■

SHELL

FUELED BY A BELIEF THAT THE AGE OF HIGH OIL PRICES IS OVER, PETROLEUM GIANT ROYAL DUTCH SHELL

The hull of the Shell deepwater oil platform Appomattox arriving in Ingleside, Texas, in October for final assembly. It will operate in the Gulf of Mexico and has been pared down to be profitable with oil at $50 per barrel.

FACES 'LOWER FOREVER'

BY JEFFREY BALL

IS RACING TO REMAKE ITSELF FOR A RAPIDLY CHANGING, NEW-ENERGY WORLD.

LAST MARCH, ROYAL DUTCH SHELL said it was selling most of its stake in Canada's oil sands, a vast project that has extracted millions of barrels of sticky, gooey hydrocarbons from the ground in a process that resembles mining more than drilling. The oil and gas giant announced that it was unloading its oil-sands assets, for $7.25 billion, so that it could double down on businesses "where we have global scale and a competitive advantage."

Left unsaid was a deeper reason for the divestiture. Months of deliberations behind closed doors at Shell headquarters in The Hague, Netherlands, had led the top brass at the world's largest non-state-owned oil company by sales to conclude that the energy industry was changing fundamentally—in a way that could turn the profitable oil-sands operation into a liability.

Internal studies by a group of analysts within Shell known as the "scenarios" team had concluded that global demand for oil might peak in as little as a decade—essentially *tomorrow* in an industry that plans in quarter-century increments. Hastening the peak was an onslaught of increasingly competitive fossil-fuel alternatives, from solar and wind power to electric cars, whose prices were dropping far faster than Shell executives had expected. When the oil-demand peak came, Shell believed, petroleum prices might begin a slow slide, dipping too low to cover the costs of oil-sands production.

This wouldn't be just another oil-price cycle, a familiar roller coaster in which every down is followed by an up. It would be the start of a decades-long decline of the Oil Age itself—an uncharted world in which, in a phrase gaining currency at Shell, oil prices might be "lower forever."

If that scenario materialized, and you were stuck holding the oil sands, Jeremy Bentham, the head of Shell's scenarios team, tells me, reprising in his British lilt the gist of a memo he wrote to his boss not long before the company decided on the sale, "you were—gosh, forgive me—fucked."

Shell—a cash machine that racked up $9 billion in profit in the first nine months of 2017; a colossus that employs 90,000 people in more than 70 countries; a corporation that, were it a nation, would have the world's seventh-largest

Part of Shell's Athabasca oil-sands project in Alberta, Canada. Shell agreed last year to sell most of its stake in the oil sands to Canadian Natural for $7.25 billion.

carbon footprint, behind Germany; and the No. 7 company on *Fortune*'s Global 500 list last year, with $240 billion in sales—is in an existential squeeze. It has concluded that oil demand is likely to peak sometime between the late 2020s and the late 2040s because of an epic shift underway in the energy industry: a transition from petroleum to electricity.

Fueling this shift are newly affordable alternatives to oil and gas—notably solar power, wind power, and batteries. Adding to it are ever tougher government constraints on greenhouse-gas emissions: Europe, China, and much of the rest of the developing world are moving to curb carbon even as President Trump pulls the U.S. out of the Paris climate accord.

If Shell failed to prepare for this new energy landscape, it could wind up saddled with massive stranded assets: buried oil and gas that its shareholders paid billions to find, but that, because of softening demand, the company found itself unable to profitably drill and sell.

Ben van Beurden, Shell's CEO, vows that won't happen. "We won't be sitting ducks," the 59-year-old Dutchman tells me in an interview in his corner office at The Hague. "We are going to adapt."

The problem is that the right path forward for the oil majors is less clear than ever before. In the past, "there was a funnel of outcomes that we had to navigate in, where a conservative approach could still work," says van Beurden. "What is a challenge at the moment," he says, "is that we don't know anymore where the future will go."

So the oilman is making some big strategic bets. If they work, he'll remake Shell for an era in which petroleum no longer is the chief lubricant of the global economy. He'll transform Big Oil into Big Energy.

HIS FIRST MOVE is to slash the costs of his operation in an attempt to position Shell better than its competitors to profitably ride Oil Age's tail. Shell expects global demand for natural gas to keep rising for several decades. But van Beurden has been slimming down his portfolio of oil projects with the intent of keeping only those lean enough to make good returns in a world in which oil prices average no more than $40 a barrel, well below the average price over the past decade.

Shell has been selling off billions of dollars worth of projects, including the oil sands, that it believes can't meet its new low-cost bar. It is redesigning its deepwater oil platforms and onshore shale-gas projects to simplify them, a major cultural change at a firm that has long prided itself more for engineering prowess than for economic discipline. And, over the past two years, the company has laid off about 12% of its workforce, or 12,500 employees, many of whom joined Shell figuring they'd have a job for life. That cutting isn't over yet.

Van Beurden's second gambit is harder. He is pushing to position Shell as a major force—the first truly global player, he hopes—in the Age of Power. He is moving Shell, which tried and failed in earlier renewable-energy forays, into a deeper round of them, part of a broader push into selling electricity. Shell is building an offshore wind farm in the North Sea; it's part of consortia installing solar farms in Oman and California; and it has bought one of Europe's biggest electric-car-charging firms and a major British electricity provider.

So far, these are tiny moves in the context of the Shell behemoth. The company says it plans by 2020 to raise annual spending on what it calls "new energies" to between $1 billion and $2 billion—a sum that, assuming it materialized, would account for between 4% and 8% of the $25 billion that Shell has estimated as its total capital spending in 2017. Van Beurden vows the renewable-energy investment will increase significantly over time as he moves toward his endgame: pumping vastly more renewables through the global network that Shell uses to produce, trade, and sell energy.

Shell said in late November that it aspires to cut the carbon intensity of its energy operations and of the energy products it sells by 20% by 2035 and "around half" by 2050. Investors concerned about corporate climate risk had urged Shell to take more action to quantify and mitigate its exposure, though the company says its move was already in the works. Shell's move is part of van Beurden's bid to preserve Shell's ability to do in the post-oil era what it has done for the past century: mold and exploit energy markets to pick off maximum profit at every stage. The difference is that, in the future, Shell will need to run its network less on dirty molecules and more on clean electrons.

"This is a matter of, How do you actually build a whole new industrial complex where

SHELL FACES "LOWER FOREVER"

JOHN ULAN—SHELL; PREVIOUS SPREAD: COURTESY OF SHELL electricity is the main way of doing things?" says van Beurden. "We are not going to play in this space in an experimental way. We're going to play in this space with conviction to win."

SHELL'S SCRAMBLE underscores unprecedented pressures across the oil industry. "The energy market is changing more rapidly than we could have imagined, and it's changing because the costs of competitive fuels are coming down," says Simon Flowers, chief analyst at Wood Mackenzie, who predicts global demand for gasoline and diesel fuel will peak as early as a decade from now and "certainly" by 2030. "If you're faced with eventually displacing your core product of oil and gas production with something new, it's an enormous task, and it will take a long time. You've just got to put yourself in a position to do so when you can—and without blowing too much shareholder value now."

Other major oil companies are attempting this shift and finding it tough. Total, the French oil firm, spent $1.37 billion to buy a 60% stake in SunPower, a major California-based solar-panel maker, in 2011, and another $1.1 billion to buy Saft, a French battery maker, in 2016. SunPower's stock price has fallen by more than half from the deal price, largely because of intensifying competition in the solar sector, and the battery business too is growing more cutthroat. Norway's Statoil is investing in offshore wind farms, leveraging its expertise building offshore oil rigs, and investing in research into capturing and storing carbon dioxide.

The surge in energy alternatives is upending established industries all across the global economy. Major electricity producers have been forced to restructure in a bid to stanch losses as material numbers of customers put solar panels on their roofs and thus buy less power from the grid. And leading automakers that not long ago laughed off electric cars as a pipe dream are now scrambling to boost production of them.

THOSE FIRMS DIDN'T SEE the revolution coming, at least not soon enough. It's the job of Bentham, the scenarios chief, to make sure Shell doesn't make the same mistake.

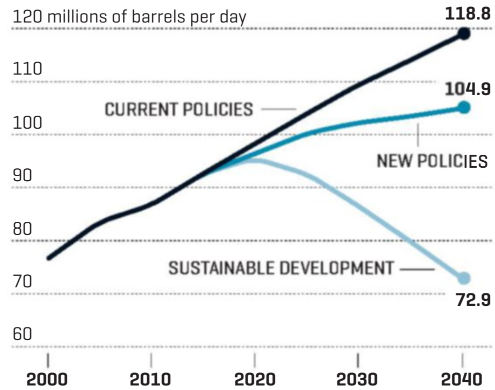
"I AM TASKED," SAYS THE OIL MAJOR'S TOP FUTURIST ABOUT THE EXISTENTIAL CHALLENGE AHEAD, "WITH MAKING SURE THAT SHELL ISN'T A DODO."

Jeremy Bentham, Shell scenarios leader

RADICAL UNCERTAINTY

Depending on how quickly the world adopts new technologies, oil demand could peak within a decade or in the 2040s. The wide range of possible outcomes is a planning challenge for Shell and other oil giants.

WORLD OIL DEMAND UNDER THREE SCENARIOS



SOURCE: IEA

The 59-year-old Oxford graduate is known within Shell as Professor Bentham. The moniker suits, because Bentham looks more don than exec. On the afternoon I walk into his office, he is sitting alone at an oval table, dressed in a baggy gray suit and running shoes, jotting notes on an electronic tablet.

One wall of his red-carpeted office is lined with several hundred books. Another is covered with papers and artifacts. One framed plaque contains a drawing of a dodo. Dutch sailors discovered the bird on the island of Mauritius in the 17th century. But as the dodo's habitat was destroyed, the bird died out. The dodo, "a once powerful bird," was hit with a change in its environment and "was unable to respond," warns the plaque, which has been handed down from one Shell scenarios head to another for the past four decades. "The dodo is now EXTINCT."

"I am tasked," Bentham tells me, "with making sure that Shell isn't a dodo."

More than five years ago, Bentham says, he and his team began to flag to Shell executives changes afoot in the economy that, they believed, might dramatically affect the oil business. Among them: the rise of electric cars. With oil selling for around $100 a barrel and gasoline prices high, sales of cars that plugged in rather than filled up were beginning to climb. But times were flush in the oil industry, and such concerns struck some at

JEFFREY BALL

ED ROBINSON—SHELL

Shell as overblown.

Then, in October 2012, van Beurden was promoted from head of Shell's chemicals business to downstream director, running the part of the business that, among other things, sells gasoline. Bentham recalls that van Beurden soon asked Bentham and his team a question: "Pushed to the extreme, how quickly could electric vehicles come?"

On Jan. 1, 2014, van Beurden became Shell's CEO. For the first nine months of his tenure, oil prices hovered comfortably between $90 and $100. Then, in the fall, they began to dive. It wasn't until February 2016 that they bottomed out, at $29 a barrel.

But something strange happened as oil prices fell: Electric-vehicle sales nevertheless kept climbing. Between 2014 and 2016, they more than doubled, from 323,000 to 753,000, according to the International Energy Agency. Similarly, IEA figures show, between 2015 and 2016, the percentage of global electricity produced by wind and solar rose from 4.5% to 5.2%—a major jump in a single year. Alternative technologies were getting more affordable.

Shell CEO Ben van Beurden at the company's offices in London in September 2017.

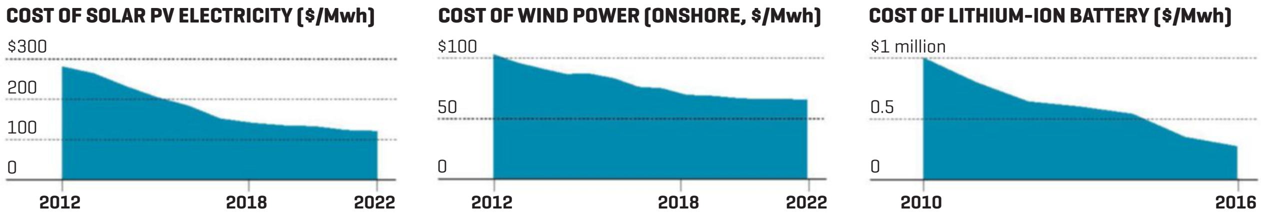
Between 2010 and 2016, according to the U.S. National Renewable Energy Laboratory, the average costs of electricity from a residential solar system and from a wind farm fell about 60% in the U.S. During the same period, according to Bloomberg New Energy Finance, the price of lithium-ion batteries, a type commonly used in electric cars, dropped 73%.

In late 2016, Bentham and his team sensed a structural change was afoot in the energy market—something more profound than just another ephemeral oil downturn.

Bentham, who appreciates the power of a pithy phrase to move his multinational's mindset, began referring within Shell to a new era for the global oil industry, one of "radical uncertainty." The phrase had been popularized earlier that year in a book by Mervyn King, a former governor of the Bank of England. It also

CLEANER, AND GROWING CHEAPER BY THE DAY

The costs of alternative energy sources like solar and wind power, as well as of batteries such as those that power electric cars, have fallen dramatically, putting pressure on oil producers.



SOURCES: IEA (DATA FOR SOLAR AND WIND SHOWS LEVELIZED COST OF ELECTRICITY (LCOE) IN 2016 DOLLARS. DATA FOR SOLAR PV IS FOR COMMERCIAL SYSTEMS); BLOOMBERG

borrowed from the thinking of famed 20th-century economist John Maynard Keynes.

Between late 2016 and early 2017, Bentham's team put together four scenarios to try to help make sense of how Shell might navigate the radical uncertainty. The company calls them the "Four Worlds."

Diagrammed, the scenarios form a quadrant. One axis is global demand for energy of all sorts. The other axis is the penetration of technologies—solar, wind, electric vehicles, and others—that reduce demand for fossil fuels.

If the quadrant with high energy demand and low technology is the world that materializes, Shell's modeling suggests, global oil demand won't peak until perhaps the late 2040s. Under this scenario, by 2040 global energy demand will be significantly larger than it is now; oil, coal, and natural gas each will account for about one-quarter of total demand, and solar and wind together will account for roughly 5%. Shell calls this scenario "Live Now."

But if the quadrant with low energy demand and high technology is the future that comes to pass, global oil demand might peak as early as the mid-2020s. By 2040, global energy demand will have grown far less; oil and gas each will account for about one-quarter of the total, coal for about a fifth, and wind and solar for roughly 15%. And the total energy pie will be smaller, because humanity will have become far more energy-efficient. It's this scenario that could most rock Shell's business. Shell's name for it: "Brave New World."

Shell doesn't have a clue which of the Four Worlds will come true. And that is its dilemma.

"WHAT IS A CHALLENGE AT THE MOMENT," SAYS THE SHELL CEO, "IS THAT WE DON'T KNOW ANYMORE WHERE THE FUTURE WILL GO."

THE ACCEPTANCE of the notion that global oil demand will peak within a generation is mind-blowing given that, just a decade ago, the chatter in the energy world was about a coming peak in oil supply. But the fact that the brightest minds in the oil business must concede they don't know whether the inflection point will come in the 2020s or the 2040s—or exactly what might take oil's place—is even more discombobulating for them.

In the analysis of Guy Outen, 57, an Australian with close-cropped hair and a serious motorcycle habit who, as Shell's executive vice president for strategy, is paid to help Shell clarify this future, the energy landscape has shifted from "complicated to complex."

Since 1971, though the size of the global energy pie has more than doubled, the relative size of the fossil-fuel slice has remained fairly constant, at between 80% and 85%. It has, Outen says, been a "complicated" world—one where the variables are clear and the answer "is something that with good maths and a good brain you can solve for."

But a "complex" world is a different and darker place. In it, the most basic contours of tomorrow's energy landscape are opaque. "There are multiple future paths to a general direction which itself isn't even set in stone," says Outen.

As Shell picks a path forward, it's trying to hedge its billion-dollar bets. Or, as Bentham likes to say, borrowing another phrase from academic economic theory, Shell's challenge is to "minimize the maximum regret."

THAT STARTS with whipping into shape Shell's oil and gas business, an empire that is mind-bogglingly big, hard to wrangle, and risky.

It features wells in the Gulf of Mexico off Texas and in the Atlantic Ocean off Brazil that Shell drills two miles beneath the sea floor with an accuracy of inches. It includes monster liquefied-natural-gas plants — among them one off Qatar that Andy Brown, Shell's director of "upstream," or exploration-and-production, activities, describes to me as "the largest thing man has built that floats." It encompasses aging projects in the North Sea, factory-like shale fields from Texas to Pennsylvania, and, oh, by the way, 43,000 gas stations ringing the planet—a larger retail network than that of either McDonald's or Starbucks.

Some green optimists portray this fossil-fuel infrastructure as itself a fossil—a relic that renewables are about to render unnecessary. Van Beurden calls that "fundamental economic nonsense," and most energy analysts agree with him. The International Energy Agency, which says that global oil demand could peak around 2020 if governments adopted particularly green policies, predicts that even if it happened, oil still would account for 23% of total global energy in 2040, down from 32% in 2016. In other words, even after oil demand peaks, the Oil Age is likely to have a decades-long tail. But riding it profitably requires radical action today.

A big Shell energy project can require investing $10 billion on the front end—with the understanding that profits, assuming they materialize as planned, probably won't come for a decade or more. Recently, in a move that is wonky but has massive repercussions, Shell enlarged the accounting toolbox it uses to decide which oil projects to invest in.

Traditionally, Shell has weighed prospects on their "net present value," essentially how much money a project will spit out now. That's a sensible metric under a worldview in which tomorrow will look pretty much like today. But because Shell has come to believe that tomorrow will look fundamentally different—that it must adjust to the possibility that oil prices will be "lower forever"—it has begun using an additional accounting method. Called the "value-investment ratio," it assesses the minimum oil price a project will need in order to throw off, far into the future, Shell's desired level of return.

SHELL FACES "LOWER FOREVER"

"In other words, how resilient is this project against a low-price world?" says Brown, Shell's upstream director. "That's a very different mindset."

THE HAGUE is where Shell's top executives sit, but Houston is the soul of Shell, the place where the company's engineering swagger runs free. Along a stretch of 12-lane highway on the west side of Houston, a strip of blacktop straddled by so many oil and gas firms that it's known locally as the "energy corridor," sits the sprawling campus that's home to Shell's deepwater operations.

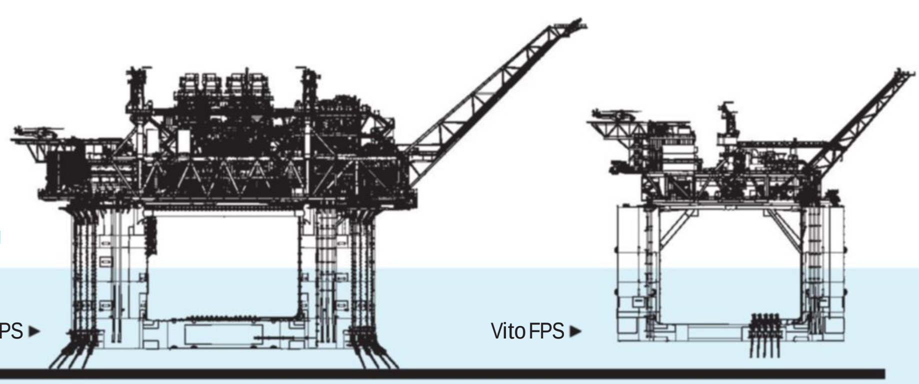
Building D houses most of the Gulf of Mexico teams. The building's inside walls are covered with what amounts to petroleum porn: floor-to-ceiling glamour shots of offshore rigs. A counter atop a file cabinet is strewn with drillers' toys: an assortment of underwater valves and fittings.

Now Shell is cutting this culture with a sharp accounting knife. One of the first patients: a prospective Gulf of Mexico oil project called Vito.

Vito was first designed in early 2014, when oil was trading around $100 a barrel. Shell engineers gave it maximal bulk, sparing little

LOWER PROFILE

Shell's Appomattox oil platform, capable of reaching 175,000 barrels of oil per day, will soon be active in the Gulf of Mexico. An even more slimmed-down plan for the proposed Vito platform shows how Shell is right-sizing its capital investments.



© COURTESY OF SHELL

expense to ensure it could pull oil out of the seabed fast and hard. But by 2015, with oil prices having cratered, the technological wonder that was Vito appeared a poster child for an overconfident industry—an expensive relic.

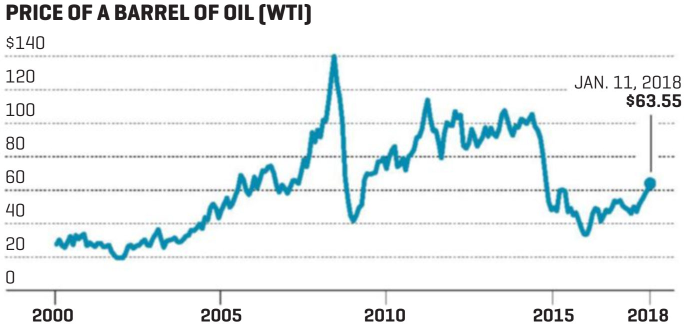
That fall, with oil prices continuing to fall, Wael Sawan, who grew up in Dubai, graduated from Harvard Business School, and did a stint as an investment banker at Goldman Sachs, was named Shell's executive vice president for deepwater. He was all of 41.

Vito had been designed with a rough assumption of a long-term oil price around $80 a barrel. In early 2016, the new young boss told the team Vito was dead unless they could slim it down to be profitable at no more than $40. "I could not stand in front of an executive committee with oil prices where they were" and ask Shell's leaders to invest in Vito as it was, says Sawan, considered a rising star at Shell.

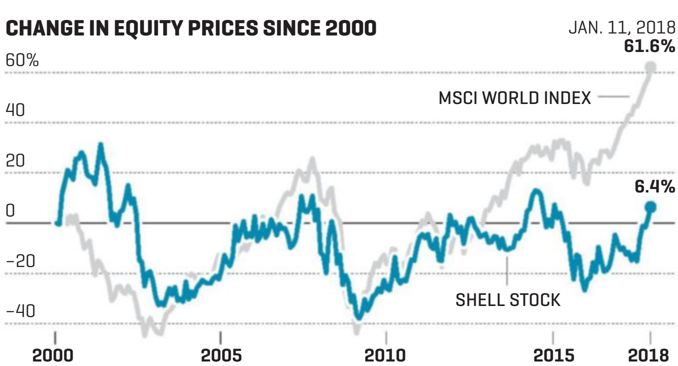
BRAVE NEW OIL-PRICE WORLD

After a decade of mostly higher prices, the oil industry was hit hard over the past few years. Now Shell must show its shareholders that it has a plan to profit even if prices never reach such lofty levels again.

PRICE OF A BARREL OF OIL (WTI)



CHANGE IN EQUITY PRICES SINCE 2000



SOURCE: BLOOMBERG

Over the next year or so, the team radically overhauled the plan for Vito. They slashed its "topside weight"—the platform's bulk—from 40,000 tons to 8,900 tons. They removed from the plans a backup tube along the sea floor that would ensure the platform could keep pumping oil even if the main tube got clogged. (A clog would hurt only production, not safety, Shell stresses.) The new Vito is right-sized, the Shell team hopes, for a world of peaking oil demand.

The effort to save Vito illustrates why, for all the industry's difficulties, deepwater oil isn't dead. A deepwater project requires massive investment at the front end, but it spins off massive cash over its lifetime. Even at a time of slowing oil-demand growth, "that's an oil position I don't mind having," says van Beurden.

Shell's executive committee is to decide early this year whether to move forward with Vito in its svelte incarnation. "Fingers crossed," says Sawan.

I**N A COMPANY** that loves bromides, there's one that has become infamous at Shell: "pots on the fire." The phrase was used by a former Shell CEO to describe the company's experimental strategy in an earlier round of investments in renewable energy. Shell reached into these technologies when they got hot, and it got burned.

Shell invested in making solar panels, only to abandon that investment after concluding it couldn't make decent margins in what Shell discovered too late was a cutthroat manufacturing game. It invested in developing wind farms, only to pull back from the sector after deciding wind was a waste because the average wind farm delivered lower margins than the average deepwater oil well. It zoomed into hydrogen, only to put on the brakes in the mid-2000s after regulators found that Shell vastly overbooked oil reserves, a scandal that prompted Shell to refocus on what it saw as the part of its business that really counted.

"We've tried these things before," and "we have still very significant scars as a result of it," van Beurden tells me. "Nothing so far has really worked, and the things that did work we abandoned because we thought they were not going to work. So we don't have a fantastic track record."

Van Beurden takes one basic lesson from this sordid history: Shell failed in renewable energy before because it didn't regard it as strategic. As a result, it behaved timidly and sloppily. It invested too much in the wrong things. It invested too little in the right things.

Today, van Beurden says, the stakes are too high for Shell to make the same mistake again. "We believe, if you look into the second half of this century, maybe half of the energy system may be renewables," he says. "The bulk of it is going to be solar, with wind being in very important niche markets here and there. So if you want to play in the non-oil-and-gas part of the energy system—which may be the biggest part of the energy system—you have to have competencies in these value chains."

SO, THIS TIME SHELL is venturing into electricity, including renewables, with the grand goal of building the dominant global clean-energy machine.

The strategy still looks from the outside like a series of disjointed, though quickening, steps. For example, Shell is part of consortia building large solar farms in Oman and California. Their purpose: to maximize oil production. The solar fields are being built beside aging oilfields—fields so depleted they now need steam injected into them to push their remaining oil to the surface. Historically, making that steam has required burning natural gas. Now the Shell consortium will produce it with solar power.

A bolder bet is Shell's effort to build solar farms near gas-fired power plants, constructing hybrid generating systems that allow Shell to do what amounts to new-energy arbitrage: tap different energy sources at different times and in different amounts to maximize profits. It has started doing this in Australia, and it plans to expand the approach.

Meanwhile Shell is leveraging its experience building giant things in the ocean to develop offshore wind farms, widely seen as wind power's next big thing. It invested in a massive offshore development in the Dutch North Sea called Borssele. Now Shell is selling its stake there and planning to invest in the early, most-profitable stages of other offshore-wind projects. Among the spots it's eyeing: the waters off other parts of Holland, off other European countries, off Taiwan, and off the U.S. East Coast. Beyond developing the wind farms, Shell intends to buy and sell the power they produce. That will let its traders squeeze out more profit, and it will count toward curbing Shell's carbon footprint.

Shell also is focusing again on hydrogen. It's part of a German experiment to install some 400 hydrogen-fueling stations across the country, a government-subsidized effort Shell sees as helping seed what ultimately could be a huge market for a new kind of juice. Long-term, Shell sees a future for hydrogen as a backbone of a worldwide clean-energy network. Hydrogen isn't an energy source; it's an energy carrier. The idea is to produce wind and solar power where it's cheap, use it to split water into oxygen and hydrogen, liquefy the hydrogen, and then—much as with today's liquefied-natural-gas trade—ship the hydrogen to markets that are short of energy, where the hydrogen could be turned, by devices called fuel cells, into electricity. With its traders and tankers, Shell figures, it would be well positioned to sell that hydrogen wherever in the world the need was greatest—and the price was highest.

Shell also is entering the business of battery-powered electric cars. In October, it bought NewMotion, a Dutch company that operates more than 30,000 electric-car charging installations in Europe and that gives electric-car owners who sign up for its service access to about 50,000 other charging points. Shell won't disclose what it paid for NewMotion, but the deal clearly was tiny by Shell standards. In 2016, according to filings, NewMotion lost \$4.1 million on revenue of \$13.5 million.

In December, Shell inked a bigger deal to buy First Utility, a U.K.-based merchant power and natural-gas utility. The companies didn't disclose the details of the transaction.

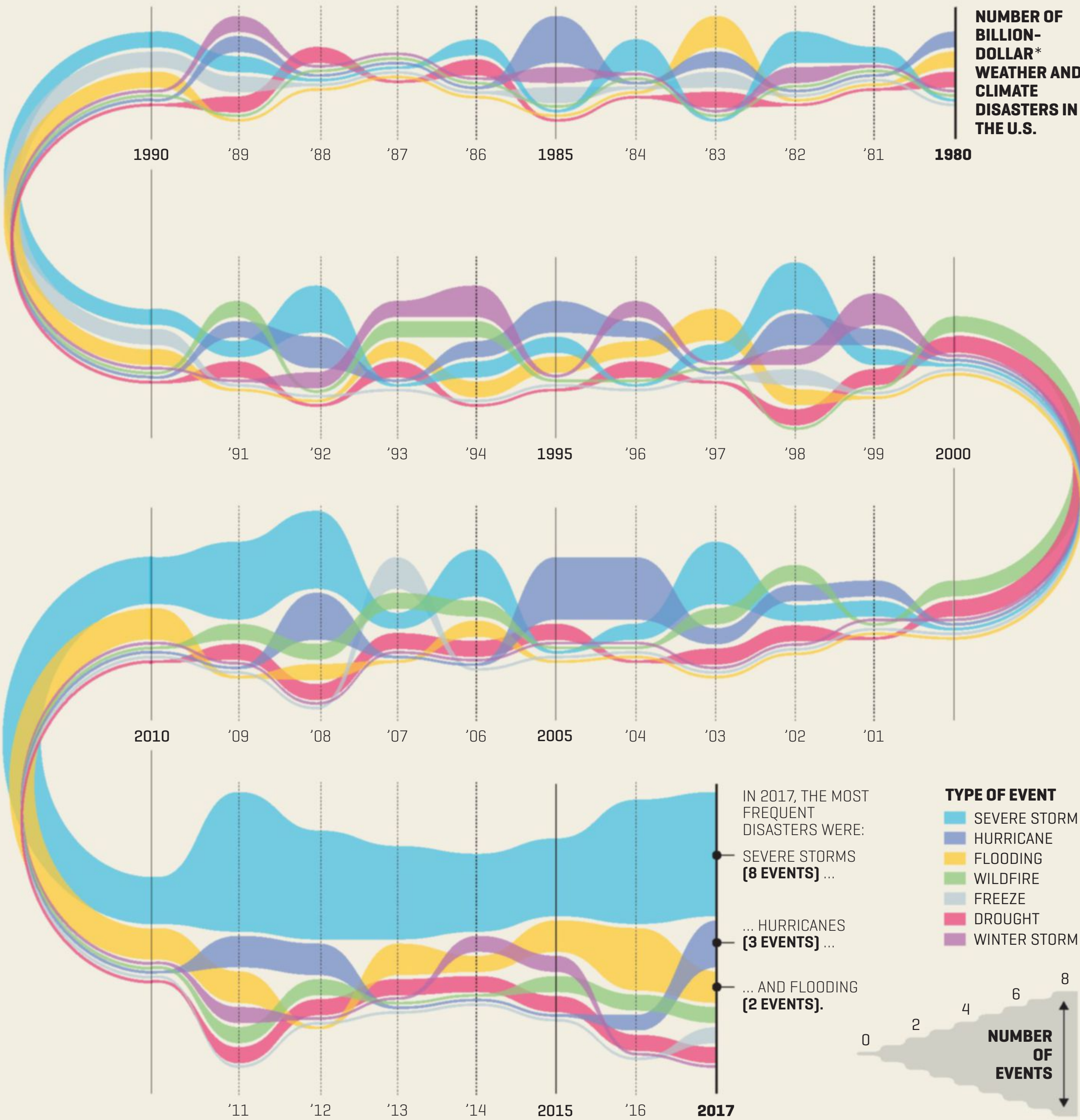
SEVERAL LARGE PENSION FUNDS and money-management firms have criticized Shell for failing to take into sufficient account the potential that, when oil demand peaks and carbon constraints bite, Shell may find itself laden with stranded assets: untapped black gold it can't profitably sell.

When I ask van Beurden about that argument, he calls it "a red herring," saying Shell would decarbonize its portfolio to avoid any chance of stranded assets. But he also says he has ordered his internal analysts to compute the risk Shell would face if he failed. His question to them: "If I'm completely stupid in a world that is changing beyond recognition, in ways that we cannot imagine at this point in time, and we do not take account of it in our decision-making, what is the likelihood that I will end up with value at risk?" The study, Shell says, is due out in April.

That afternoon, as I leave Shell's headquarters, I pass in the lobby a door-sized rectangular chunk of rock containing the fossilized remains of dozens of pecten, bivalve mollusks related to the scallop. The pecten shell is Shell's logo. It was favored by one of the company's forebears, whose family business in London had traded decorative seashells earlier in the 1800s. That was before the dawn of the Oil Age, the energy transition that would fuel the company's real rise.

If its leaders can navigate today's energy shift, Shell may well be operating a century hence, having moved from seashells to petroleum to... who knows? Solar? Wind? Something else?

If they don't, the name Shell may come to evoke a different species: the dodo.



STORM WARNINGS

EXTREME WEATHER IS becoming more common, and the economic impact is soaring. Last year there were 16 weather events in the U.S. that caused at least $1 billion each in damage, according to the National Oceanic and Atmospheric Administration. The cumulative cost was $306 billion—easily surpassing the previous one-year record of $215 billion set in 2005. In September a report from the nonprofit Universal Ecological Fund, "The Economic Case for Climate Action in the United States," estimated that total climate-related economic losses and health costs in the U.S. averaged $240 billion a year over the past decade. The authors project the annual cost will rise to $360 billion over the next 10 years. —BRIAN O'KEEFE

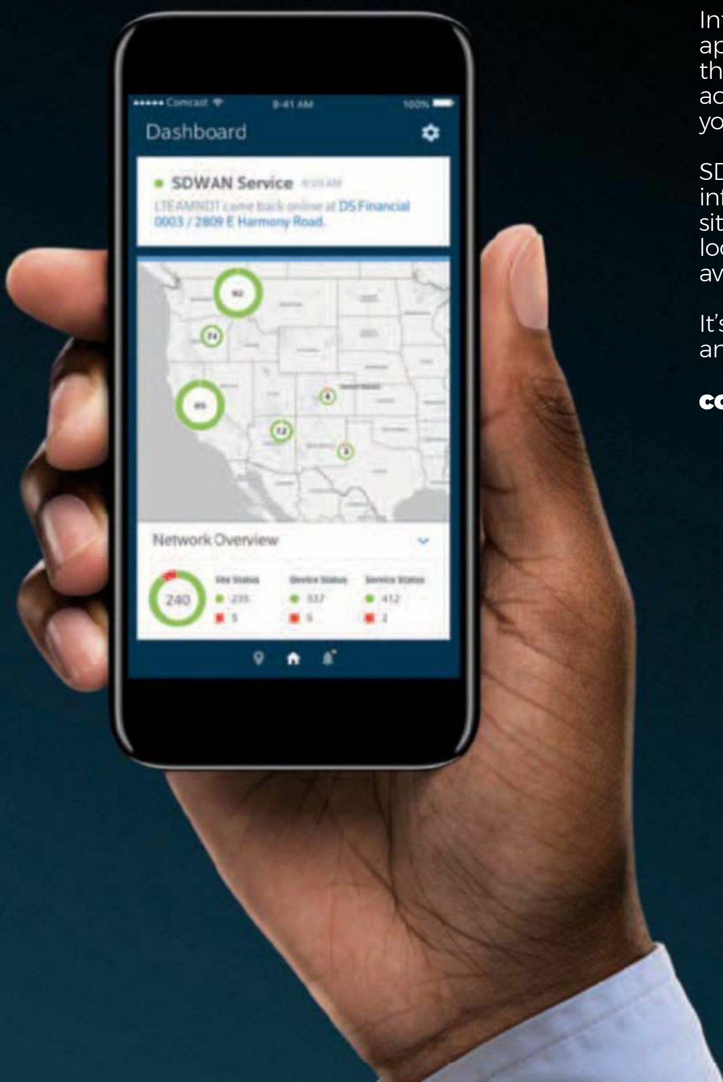
SOURCE: NOAA

GRAPHIC BY NICOLAS RAPP

* ADJUSTED FOR INFLATION

REAL-TIME NETWORK PERFORMANCE DATA ACROSS ALL YOUR LOCATIONS,

IN THE PALM OF YOUR HAND.



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