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ISSUE 5.0

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NEXT MAGAZINE

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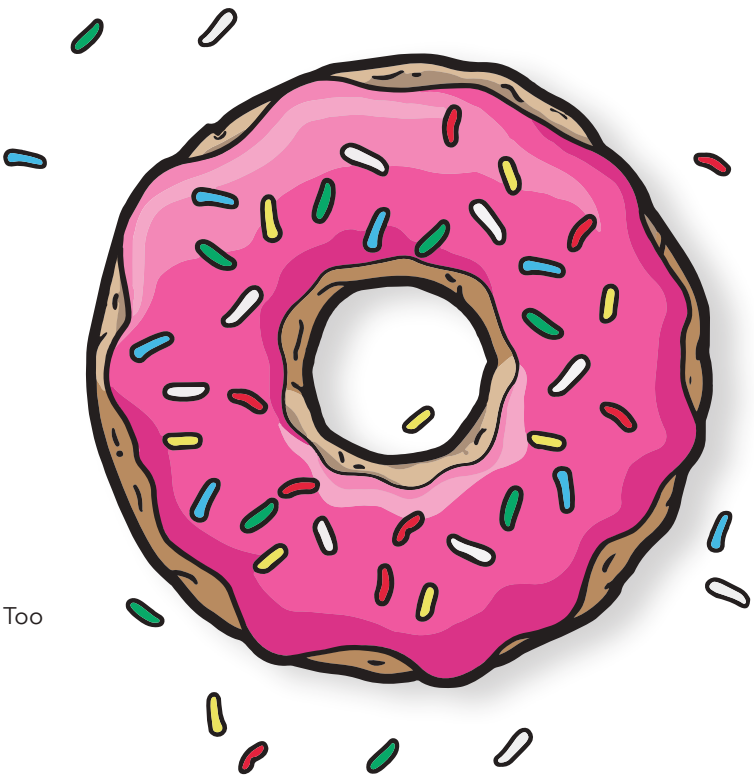

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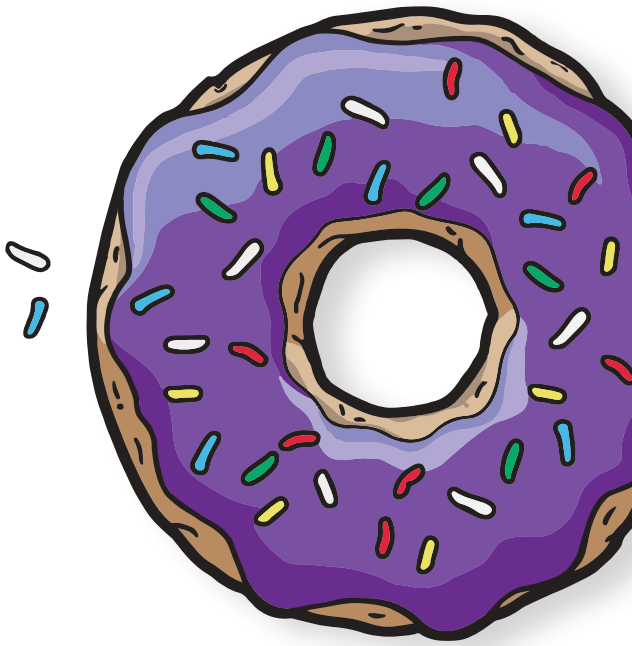


LETTER FROM THE PUBLISHER

With the launch of this edition of NEXT Magazine, I'm also reflecting on the 10th anniversary of Nutanix as a company. It all began with a single disruptive, powerful idea: bring datacenter control back to IT. If we could successfully hyperconverge storage, compute, and virtualization, we could free up IT to focus on business transformation and innovation instead of the day-to-day grind.

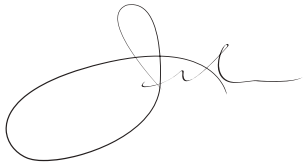
There were skeptics, naysayers, defenders of "the old way." Yet our founders, VCs, and early employees remained resolute that there had to be a better way to build, manage and operate datacenters. With one-click simplicity, consumer grade design, webscale engineering, and ultimately, freedom of choice -- of hypervisors, hardware and clouds.

Together, we've created a new category—hyperconverged infrastructure. We've earned the top leadership position in industry analyst reports. We've transitioned to all software. We've achieved 90+ Net Promoter Scores for five years running. We've modernized more than 15,000 datacenters in more than 160 countries. And now, we're hyperconverging clouds, so customers can get all the goodness of Nutanix even in a hybrid cloud world.

Along the way, we've had to think differently about all aspects of our business to foster innovation. We've bucked naysayers and skeptics, as longtime *The Simpsons* writer Mike Reiss has experienced throughout the course of his career (see p. 22). We've been maniacal about our Hungry, Humble, Honest with Heart culture, similar to Skills Inc., an organization that has found new opportunities for the disabled (p. 48). And sometimes we've had to "unlearn" habits, (a concept you'll read about on p. 18) in order to keep our thinking disruptive.

This issue of NEXT is packed with examples of looking at business and technology from a variety of perspectives in order to stay relevant, competitive, and true. I hope you walk away with new ideas for sparking that disruptive thinking inside of your organization.

Thank you for being a believer, no matter where you joined us on our 10 year journey. The best is yet to come!



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OPINIONS

{SECURING}

THE NEXT GENERATION INTERNET

A Q&A with Harvard Security Guru Bruce Schneier

By Gene Knauer

Bruce Schneier is a man on a mission to make the world more secure, both online and offline. His experience and vision stretch from the minutiae of computer systems, networks, apps, and devices to public policy and international law. Author of 13 books (his latest is *Click Here to Kill Everybody*, WW Norton & Co., 2018) and many articles and papers, he has testified before Congress and is regularly quoted in the news media. Schneier teaches and lectures at the Harvard Kennedy School; serves on the boards of the Electronic Frontier Foundation, AccessNow, and the Tor Project; is an Advisory Board Member of the Electronic Privacy Information Center and VerifiedVoting.org; and is a special advisor to IBM Security.

How did you become a security guru and what does that entail?

I've always been interested in security, and my focus has continually generalized over the years. I started in mathematical security—cryptography—then broadened to computer security, network security, and general security technology. I researched and wrote about the economics of security, the psychology of security, and the sociology of security. These days I focus on the public policy for security.

This is increasingly important. We live in a world of hyperconnected devices where everything is a computer. Your phone, microwave, refrigerator, ATM, car, data centers, power plants—they're all computers.

Issues of public policy are often deeply technological and their solutions require technological understanding—but today people in policy and technology talk past each other. We see that in policy debates about encryption, data privacy, social media platforms, and so on. There's a lack of understanding on both sides, and that limits our ability to make progress.

Why aren't we more secure today?

There are many reasons. The most important is that software is poorly written. This is economics at work; the market doesn't want to pay for quality software. We want our software fast, cheap, and feature rich; quality is secondary. Poor software is full of bugs, and some of those bugs are security vulnerabilities. This is not going to change anytime soon, because software quality is not valued.

This means that all the software we use is filled with security vulnerabilities. We deal with this problem through patching—when a specific vulnerability is discovered, the software vendor fixes it and pushes a patch to all users. This mechanism works fine in laptops and smart phones, but is starting to fail—especially in low-cost devices like DVRs, programmable thermostats, refrigerators, and other Internet-of-Things devices. Many of these are unpatchable, and they'll stay around for 10, 15, or 20 years without any sort of upgrade.

Things are getting worse. Authentication is starting to fail. Authentication has only ever sort-of worked. But right now, authentication generally involves a person; the user authenticating to a device or service. In the future, it will be objects authenticating to other objects, like a car authenticating to a traffic signal. We need to find a way to do thing-to-thing authentication at scale.

Supply chain security also is failing. We worry about hardware and software from China or Russia. We worry about hacked apps in the Apple or Google app stores. These vulnerabilities are major, and hard to solve. You have to be able to trust every piece of the supply chain, yet you can't trust any of it.

What were some of the worst recent cyberattacks you're aware of?

I don't like lists of the "worst" attacks. Worst is a relative term, and hyping the disasters only serves to scare people. What's interesting is how routine cyberattacks are these days. Everybody knows about them. The city of Atlanta was paralyzed by ransomware last year. China stole the files of nearly every employee in the U.S. government. North Korea attacked Sony. Someone hacked Equifax and stole the personal information of nearly every American. Billions of people around the world were hit by all sorts of cyberattacks last year.

Up to now, all of this has been perceived as a manageable problem—one that doesn't require any government intervention—but I think that's going to change. Until now, when systems were hacked, the hackers stole data and money. This is undesirable, but it's easy to leave it to the industry to deal with it. But when you have computers that can affect the world in a direct physical manner, there are real risks to life and property. This has to be addressed in more direct ways. We can't have people hacking cars and disabling the brakes. Or hacking into medical systems and changing people's blood types. Or hacking into power plants and causing blackouts.

Are security fears online starting to permeate the real world? Are we becoming less trusting as a society?

That's a complicated question, and one much broader than the Internet and its vulnerabilities. Many people have written about how general trust in society is ebbing, what

is causing it, and how we might recover. What's interesting from a security perspective is that low trust societies are expensive. They require security technologies to a greater degree. They limit individual and societal options. You can't plan long term if you can't trust society's institutions.

Why is securing technology and data so hard to get right?

It's actually not that hard to get right. We have the technology. The problem is the economic incentives. The market doesn't reward good security, so companies don't provide it.

This speaks to the solution. The economic incentives for providing effective security measures must be there. When I teach cybersecurity policy, I spend a lot of time on these forces. It's important to understand the psychological, political, educational, governmental, and market perspectives on how technology is being used to understand how to effectively lobby for changes.

I really see our security problems primarily as policy problems. And we as society have a robust policy toolkit to improve things; treaties, policies, standards, regulations, liabilities, courts, and so on. I don't think it's going to be easy. I expect a hard political battle against the powerful companies that would prefer to make money unimpeded by concerns of security and safety.

How does the U.S. compare to the world in terms of computer security?

Everyone's computer security is basically the same because we all use the same technologies. Poorer countries spend less on security, but they also have less to steal. Europe is ahead of the U.S. in regulating security and privacy. Europe is the regulatory superpower on the planet, and it shows. They enacted General Data Protection Regulation or GDPR, which goes a long way to protect individual data privacy on the Internet.

The Europeans have their political problems, but they don't have the strong bias against government regulation that you see among the current U.S. administration. That's why they've been able to pass these regulations.

In the U.S., we're seeing some of the states step in to deal with cybersecurity and data privacy. Last year California passed a comprehensive data privacy law, as well as a first-step Internet-of-Things security law. New York is working on regulating cryptocurrencies. Other states are trying to regulate data brokers. In reaction, the big Internet companies like Google, Facebook, and Amazon are starting to push for weaker national legislation that will pre-empt these stronger state laws.

Are you optimistic or pessimistic that the Internet+ will ever be secure?

I am short-term pessimistic and longer-term optimistic. We're going to live with major security gaps and will suffer the consequences until governments step in to provide common sense and fair regulations. The world we have today is based on letting private industry do its thing. But the government needs to step in now.

I think that technologists need to get more involved in public policy. Both are needed to solve these problems. Right now, technology has outpaced our ability to regulate it—and is off doing its thing without societal oversight. That must change or else we could wind up with some very destructive outcomes.

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DIGITAL TRANSFORMATION IS FOR TRADITIONAL ENTERPRISES, TOO

Learn to transform like a Japanese Insurance Comapny

By Shigeyuki Suganuma

Information technology (IT) has the power to change the world. Thanks to Moore's Law, inexpensive IT resources and processing power are in abundant supply, enabling businesses across a wide variety of industries to digitize and automate manual processes, disrupt existing business models, and transform entire industries.

Even traditional enterprises can and should look to technology as they plan their futures. Take my company, ORIX Life Insurance Corporation. When you think of cutting-edge innovation, a company that sells term life and medical insurance products does not typically come to mind. Yet, I believe the things that we have been doing within our industry are most definitely transformative. Here are some insights and things we learned along the way that I'd like to share with other IT leaders. I hope you find them useful.

THE GOAL OF IT IS NOT TRANSFORMATION

Don't get hung up on the term "digital transformation." Not all transformation is going to be as flashy as launching a new and disruptive digital-native business. For business leaders, any transformation is good if it means improving the productivity and bottom line of the existing business. The true objective of IT is to serve the needs and objectives of the business, whatever they happen to be. Those goals will be unique to your company and the industry it serves.

USE EVERY OPPORTUNITY TO UPGRADE YOUR BACKEND INFRASTRUCTURE

Evolving traditional business IT infrastructure is a never-ending challenge, and perhaps even more so in the insurance industry. The rapid growth of our business required the need to upgrade to a more flexible infrastructure to handle the growing number of policies we were supporting. However, life insurance products are basically a policy extended over the lifetime of a customer, so we also have to maintain decades-old information assets to continue to support our older insurance products. In order to scale fast without disrupting other services, we would methodically and strategically make structural changes and virtualize back-end systems whenever we developed or repaired front-end applications. Every time applications running on Solaris and AIX required upgrading, for example, we would convert them to run on open Linux or Windows. In this way, we were able to make gradual, yet dramatic, transformation possible by unifying and consolidating foundational architectures with stable and inexpensive commodity solutions whenever it made sense to do so.

BREAKDOWN BIG AI INITIATIVES TO AUTOMATE ENTIRE PROCESSES

Even though we implemented a paperless system, you would be surprised at how much paper is still used in the medical industry. Standardization is critical when digitizing documents, but in reality, it's not so easy to implement. It would be ideal if everyone used the medical certificate forms designated by the insurance company, but each hospital, even individual doctors, uses whatever format they like, including handwritten notes.

Optical Character Reader (OCR) technology is available but is not particularly accurate when reading handwritten numbers or different form layouts. So, we currently have system input operators called "punchers" that check every handwritten document and manually input it using standardized injury or disease codes.

We're exploring a combination of image recognition, natural language processing (NLP), mining and machine learning to automate the entire process, from digitization, standardization, assessment, and circulation of the results. The aim is to automate the subsequent assessment of insurance payout through machine learning using past claims and other digitized information.

By not lumping all AI technology together and applying the right technology to each step in a process, it's possible to automate an entire end-to-end function of work. By completely rethinking your process design, it's possible to reach new heights of productivity. For instance, in the insurance industry, a "completed document" was always considered the starting point for recording and processing data. But big data and machine learning technology exists today that can profile individuals and process information about them in real time without anything like a "document" even being necessary to start the process.

DON'T PITCH TECHNOLOGY; SOLVE BUSINESS PROBLEMS

When speaking to business leaders, we didn't talk about "new" technology, we positioned our ideas as desirable technology—meaning it would have the desired effect on business outcomes. We also didn't try to sell big platform changes without being able to prove our assumptions.

We knew our operating costs increased as our infrastructure became increasingly siloed—and this was growing worse as our number of policies grew. We believed that breaking away from our current siloed infrastructure design and moving to virtualized resource pooling across the enterprise was the answer. We decided to test our hypothesis on a new Security Information and Event Management (SIEM) solution implementation. It was important that the storage to collect logs could expand flexibly, which made it an ideal candidate for hyperconverged infrastructure. By executing at the project level, we were able to prove to management that this sort of resource pooling capability could substantially reduce operating costs, and we used it to advance future pooling initiatives.

THERE'S MORE TO TRANSFORMATION THAN TECHNOLOGY

Digital upstarts may be the exception, but traditional companies are hierarchical organizations. Despite the rise of Agile and DevOps, IT organizations in these companies are also hierarchical. For good or bad, all existing IT infrastructure, whether on premises or in the cloud—data centers, PCs, mobile, IaaS, PaaS, SaaS—are managed and maintained by IT. This makes sense since IT is where the specialized expertise resides to ensure stability and security of the system.

However, when IT is too slow to respond, shadow IT will begin to take hold among business units that can't wait for IT to accept requests for vendor services to be connected to the department's core system. In reality, shadow IT is a great opportunity for the CIO or IT leadership to affect

more change. I like to promote the idea of establishing small teams or "pods" of three to six people that serve as a unit to convert the system's functions into micro services (using Agile methods for development and DevOps for implementing these services). Don't think of these pods or units as a fixed organization but as a community that can form to enable a certain aspect of a project by configuring nearby functions or connecting to completely different functions to support larger projects or programs.

According to human resources management theory, there are three types or levels of specialists within an organization: A type I specialist is proficient in one specific area; a type T individual is a specialist in one area but has expanded capabilities to be able to cover areas related to his or her specialty. A type π is not only adept at multiple specialties but can also manage operations as a whole.

Each of our pods is typically led by a type T or type π specialist and tailored to the needs of a specific business area. So, the leaders speak the language of business. One may lead a new customer experience project, another may pursue a new IoT initiative, while a third seeks to apply AI to enhance an existing business process. These communities can be spun up as needed and micro services can be developed even before the current architecture is not yet fully capable of supporting it.

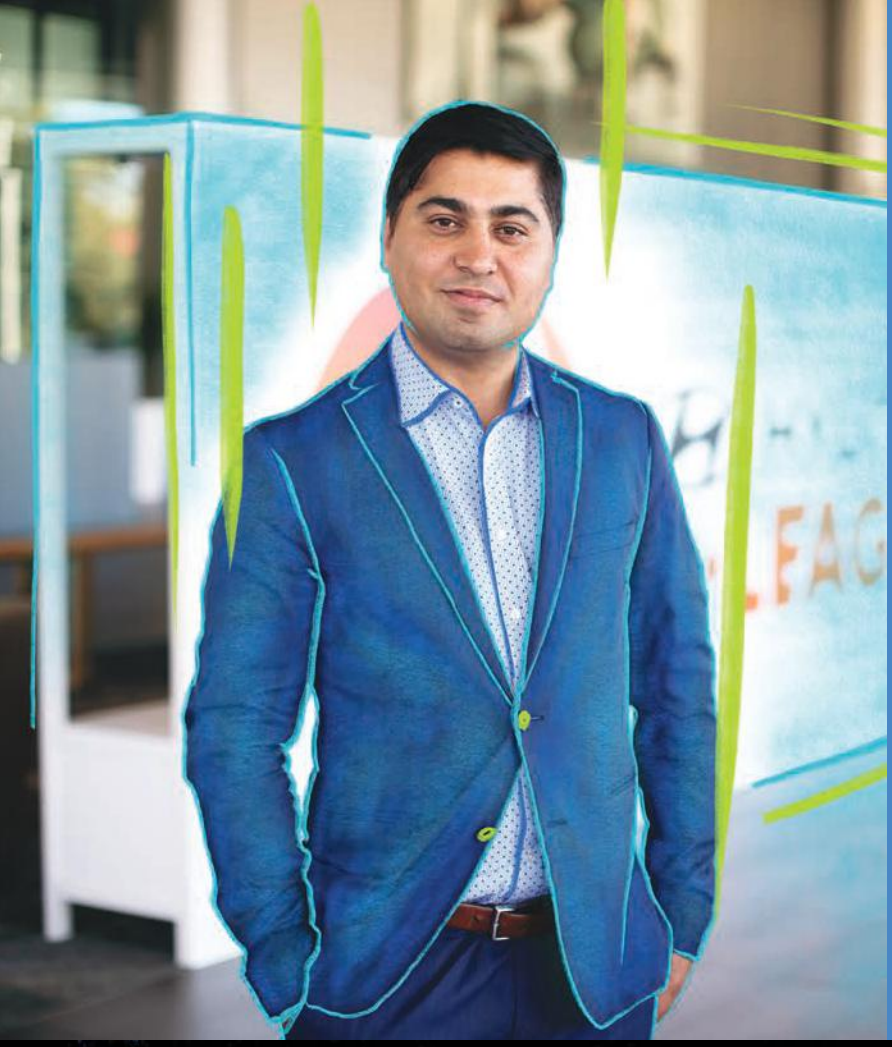
SUMMARY

IT's power rests in its ability to process information to enhance business decision-making and strategy in a way that is appropriate, actionable, and expedient for that business. Whether you are looking to transform your entire business model or make more evolutionary improvements, the CIO must be both a master of technology and have a broad understanding of the business to avoid the trap of expertise.

The challenges will always change, but they will never end. I think this is the same in every industry and I hope we can continue to share the difficulties and solutions we encounter along the way.

ABOUT THE AUTHOR

Shigeyuki Suganuma is the Corporate Senior Vice President at ORIX Life Insurance Corporation based in Tokyo, Japan, where his strategic work overseeing IT includes everything from life insurance products and business application development, to enterprise architecture and infrastructure operations.



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WHY LEADERS WISHING TO TRANSFORM THEIR COMPANIES MUST START WITH THEMSELVES

By Barry O'Reilly

Barry O'Reilly is the author of *Unlearn: Let Go of Past Success to Achieve Extraordinary Results*, and co-author of the bestseller *Lean Enterprise: How High Performance Organizations Innovate at Scale*. A highly sought-after executive coach and founder and CEO of ExecCamp, an entrepreneurial experience for executives, Barry's mission is to help global organizations and leadership teams reinvent their future, not fear it. You can learn more about Barry at barryoreilly.com.

The first thing most CEOs do when they join a company is to meet with their executive team to find out what's working, what needs fixing, and who can fix it. When John Legere took over T-Mobile in 2012, the first thing he did was have a direct connection to the company's customer complaint line installed in his office. For four hours each day he would listen to customers complain—mostly about their mobile phone bill and how it would suddenly skyrocket (usually during months when they traveled extensively).

"Don't they understand how mobile contracts work?" That would have been the expected response from an executive who spent a lifetime in the industry. Instead, Legere knew intuitively that he needed to "unlearn" what he knew about contracts so he could truly hear and act on the feedback he was receiving. Not long after, he introduced the world's first no-contract, fixed-pricing mobile service and crushed his competition, forever transforming the industry.

TRANSFORMATION STARTS AT THE TOP

Transformation. Digital Disruption. Call it what you will, the terms have been so over-used you'd be forgiven for believing it's just marketing hype. But the threat is real. Thanks in large part to digital-native upstarts, the average lifespan of an S&P 500 company has shrunk from 60 years to less than 20. In fact, only 15 percent of the Fortune 500 from 50 years ago remain on the list today. That's why 85 percent of organizations across a wide variety of industries have embarked on their own digital transformation journeys. Sadly, according to a recent IDC study, only seven percent can be classified as digital transformation leaders. Why is that?

Because transformation is less about technology and more about business model disruption—and that means imagination and the courage to think and act differently—and that must start at the very top. Everyone talks about companies being disrupted, but it's really the leaders of those companies that get disrupted because they are holding onto legacy behaviors or outdated thinking and methods—meanwhile, the world is innovating around them. The world changes. Technology changes. Customer demands change. Yet people get stuck using the same behaviors and old paradigms. Why? Because they worked before. This is especially true for executives who've spent a lifetime honing their expertise. Learning new behaviors is not the problem for these executives. It's their inability to "unlearn" their existing behavior and mindset that is challenging because these are the very things that got them where they are today.

UNLEARNING IS A PROCESS OF LETTING GO

Unlearning does not mean that everything you know is suddenly irrelevant. It's not about forgetting or discounting your experience. Unlearning is a conscious act of letting go of once-useful mindsets and potentially outdated information and behaviors and opening yourself up to new information that will inform effective decision-making and action.

The framework for breaking the cycle of learned behaviors looks like this:

1. **Unlearn** the behaviors and mindsets that keep you and your business from moving forward.
2. **Relearn** new skills and strategies necessary for true transformation through safe experimentation.
3. **Breakthrough** old habits by opening up to new ideas and perspectives.

The key is in recognizing that what you are doing is not working. You'll know that it's time to unlearn when you're not achieving your desired outcomes or living up to the expectations you set for yourself. Or, perhaps, you are avoiding certain challenges altogether. Fear of change or fear of failure is also a strong indicator for the need to unlearn.

A SAFE PLACE TO EXPERIMENT

Once you recognize that it's time to unlearn, you need to create a safe space to relearn new behaviors and experiment to find the ones that will move you toward the outcomes you're aiming for. Nobody likes to do things they suck at, especially in front of an audience. When you're an

executive, you're exposed—thousands of people are watching your every move—so, when you fall on your face, the pain is magnified.

We created our workshops as a safe place where executives challenge themselves, get outside their comfort zone, break existing models and behaviors, and experiment with new ones. In essence, executives leave their companies for several weeks with the explicit goal of inventing a new business that will disrupt their existing one. As a byproduct, they end up disrupting themselves.

Getting away from your day-to-day routine helps break the calcification of the environment that you're in. People tend to have automatic responses to familiar situations. They hear certain keywords or recognize familiar situations and respond almost autonomically. When you take people out of their environment it gives them a chance to reimagine new behaviors and experiment in a way that is safe to fail.

UNLEARNING CAN BE TAUGHT BUT CHANGE MUST BE EXPERIENCED

In traditional leadership education, we push leaders into these one-day innovation off sites or week-long programs and push ideas onto them and expect them to come back with changed behavior. But change comes from experiencing the results of new, learned behaviors first hand. And to learn something new, you need to be willing to unlearn what you already know.

We had the leadership team from one of the top airline groups in the world in one of our ExecCamps. Their senior leader was a 20-year veteran in the industry, a real expert. He had this idea for how they could transform their booking platform—all they needed to do was get the team back in the office to build it. They didn't know it at the time, but this was exactly the type of old behavior that they needed to unlearn—pushing their ideas onto the team as well as onto the market. So, we built a prototype of the platform and shared it with actual customers. Guess what? The customers didn't get it. Sticking with old patterns, the exec said, "Must have been the wrong customers. Bring me the right customers." So, we brought in more customers. The same thing happened. We had to do this four times before the lead exec finally admitted that it wasn't the customers. His idea didn't work. He walked away understanding that pushing his own ideas was a personal blind spot; it may have worked for him in the past, but it wasn't working now. But he had to go through the process of trying his tried-and-true behaviors before recognizing the fallacy in it.

WHAT YOU CAN DO TO BEGIN YOUR OWN UNLEARNING JOURNEY

Not everyone is able to step away from their businesses for weeks or months at a time—although I highly recommend finding the time. In the meantime, here are some things you can do, and the mindset you should adopt to begin your own successful unlearning transformation:

- **Reignite your curiosity**
  In order to change, it's important to be curious. When you send someone off to solve a problem and they come back with a contrary view to your own, do you shut them down or ask them why? It's important to recognize that the goal is not to be right but to find the right answers. By being curious and always asking "why?" you begin to view your beliefs as merely hypotheses to be tested. Then you can develop a system where you design experiments to test your assumptions, get new and better information, and find out what really works.

- **Think big but start small**
  People fear failure, but they really shouldn't. Failure is merely a signal that we're not on the right path. We need to course correct. So, to make trying new things feel less risky, I tell clients to think big about what they want to unlearn, but start small as you relearn and experiment with lots of different behaviors. Starting small creates recoverable situations so when you make a mistake, you're not blowing up the farm. By tackling these small changes leading up to the "big thinking" outcome you're shooting for, you also create opportunities for people to feel success along the way.

- **Take ownership of the problem**
  When things aren't going well and you're not achieving your desired outcomes, tell your team "it's not you, it's me." And mean it. Transformation begins with you. If change isn't happening, you must hold yourself accountable rather than fall back on the all-too-common practice of blaming failure on circumstance or someone else.

- **Become a role model**
  You don't need to have all the answers. Many employees model the behaviors they witness in their leaders. When they see executives who are being vulnerable, curious, and open to experimentation, it becomes a very powerful accelerant throughout the entire company.

- **Get comfortable with being uncomfortable**
  To truly transform, you're going to have to experiment with behaviors that are difficult or new for you. You will struggle at first. That may feel uncomfortable but it's a discomfort you need to commit to if you want to succeed. By actively trying new things and putting yourself in situations where you are getting outside of your comfort zone, new opportunities and personal growth inevitably follow.

- **Don't ever stop**
  Unlearning is hard work. Just when you feel like nothing is going to work is the time to accelerate your rate of experimentation and find the breakthrough you've been looking for. One of my favorite quotes from one of our camp participants came from the chief digital officer at IAG. He said, "When 97% of people think that you should stop doing what you're doing and just revert back to what's comfortable—that's when the breakthrough journey really begins."

IT'S NOT ONE AND DONE

One of the dangers of becoming an expert with 20+ years of experience is that your knowledge becomes an inhibitor for you to change. All your feedback mechanisms are telling you that you must be doing the right things because you've been elevated in the company to an executive position. But when you rely solely on past achievements you immediately put yourself at risk of outdated thinking and practices that will no longer work.

I have seen this method of unlearning, relearning, and breakthrough work time and again with business leaders at some of the largest companies in the world. But you don't unlearn once and then you're done. If you embark on this journey—and I hope you do—you will learn that unlearning is an ongoing, recursive and virtuous system the more you use it.

BUSINESS ADVICE FROM the SIMPSONS?

The Simpsons enters its 30th season this year, making the Emmy-award winning primetime cartoon the longest-running scripted series by far in the history of television.

What's the secret to the show's longevity? And what, if any, lessons can be applied to the world of business? For the answers, we asked long-time Simpsons writer, producer, and one-time showrunner, Mike Reiss.

Most scriptwriters toil in relative anonymity, so you will be forgiven if you've never heard of Mike Reiss. In his 35-years in Hollywood, Reiss has written for classic TV shows like *ALF* and *It's Garry Shandling's Show*, and for comedy legends such as Johnny Carson and Joan Rivers. He was co-creator of the animated series *The Critic* featuring Jon Lovitz, has written several features, and has been hired to punch up countless others. To paraphrase Troy McClure, "you may have seen his work in such films as *Ice Age: Dawn of the Dinosaurs*, *Despicable Me 2*, and *Hard Drinkin' Lincoln*." (That last one sounds like a Troy McClure film, but it's a real series that Reiss developed for the web).

Outside of his Hollywood career, Reiss has authored 20 children's books and several off-Broadway plays. In his new book, *Springfield Confidential*, Reiss shares what it was like to work on *The Simpsons* for the last 30 years. He provides insider insights into why the beloved series has lasted so long. Ironically, the show that brought us "D'oh!" and "Mmmmm, sweet creamery butter" offers some surprising insights for business leaders striving for the same longevity.

Keep the executives out of the creative process

If you take away just one lesson from this article, let it be this: Hire people that are great at what they do then get out of their way. In television, that means keeping the executives out of the creative process. "In network television, you're just overrun by people with no creative experience telling you how to do your job," says Reiss. "I had eleven executives working full time on a sitcom I worked on for ABC. They would bombard me with helpful suggestions, like: "I love it, but does the Rabbi have to be Jewish?" and "Can you make Satan more likable?"

Reiss has seen worse. "My friend did a pilot for a red-hot comic, and every day he had to send copies of the script to 45 executives. I scanned the list and told him that three of the people on it were dead. He replied, 'I wish more were.'"

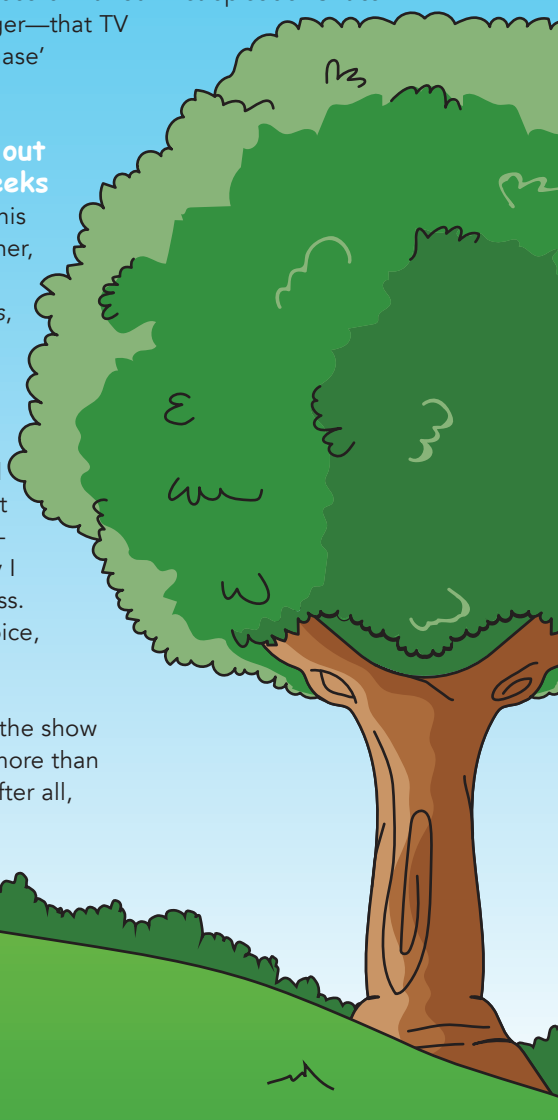
The Simpsons had a "no-exec" policy from the start. James L. Brooks, the show's legendary producer, decreed that no network executives would be allowed anywhere near the show. "Any bum off the street was welcome to come and watch," says Reiss, "but not the president of the network—that is until he gets fired and becomes a bum on the street. Interestingly, 80% of L.A.'s homeless population is made up of former network presidents."

To keep executives from meddling, it helps to be successful from the start. *The Simpsons* debuted to the highest ratings in the history of the Fox network. "You'll read articles that say it was slow to build, but that's not the case," says Reiss. "We set a record with our first episode. Critics called it a game changer—that TV had entered a 'new phase' with The Simpsons."

Act like you'll be out of a job in six weeks

When Mike Reiss and his long-time writing partner, Al Jean, were hired to write for *The Simpsons*, nobody wanted to work on the show. In fact, the writing duo got the job after their friends, Max Pross and Tom Gammill, turned it down. "I got the Simpsons job the same way I got my wife," says Reiss. "I was not the first choice, but I was available."

Not a single writer on the show thought it would last more than six weeks on the air. After all,



You have to pity a poor joke that's in the first draft of a script because it's gotta make a room full of people laugh four or five separate times to make it to the finish line.

In *Springfield Confidential*, Mike Reiss shares his behind-the-scenes stories about his work on the most iconic American cartoon family ever. Available at Amazon.com and bookstores everywhere.

there hadn't been a cartoon in prime time since *The Flintstones*. Worse yet, the show would be on the Fox network, a new enterprise that no one was even sure would last. There were clues that the Fox execs agreed with the writers' assessment for the show's prospects: The premiere was held in a bowling alley and the writer's room was a trailer. "I assumed that if the show failed, they'd slowly back the trailer up to the Pacific and drown the writers like rats," says Reiss. Only Sam Simon [*Simpsons* co-creator] was optimistic. "I think it will last thirteen weeks," he said. "But don't worry. No one will ever see it. It won't hurt your career."

Since they thought no one would be watching, the writers didn't make the kind of show they saw on TV. They made the kind of show they wanted to see on TV. "Each episode was unpredictable and the only rule we made for ourselves was don't be boring," says Reiss. "Scenes were snappy and packed with jokes—in the dialogue, in the foreground, even in the background. When Homer went to a video arcade in episode six, Al and I filled the place with funny games like Pac-Rat, Escape from Grandma's House, and Robert Goulet Destroyer. Remember, this was 1988. It's no joke to say that the fastest-paced, most irreverent comedy on TV at the time was *The Golden Girls*, a show about three corpses and a mummy. (I broke into sitcoms writing a script for *The Golden Girls*. Now I am one)."

Check your ego at the door

On *The Simpsons*, every episode is a team effort no matter who wrote the first draft. "Somebody writes a script—and they write the very best script they can, knowing that it will go to a room full of writers who will sit there and change it a line at a time," says Reiss. Often it will go to a second writers' room for polishing. Then, they read the script out loud with the cast to hear how it sounds, how the story is tracking, and rewrite it again. The animators create a rough black-and-white storyboard, which is again critiqued by the creative team, and a rough animation called an animatic is developed and shown to a group. "We see what's making people laugh and we fix what's not working," says Reiss. Even after an episode is sent off for full-color animation, changes are made based on audience reaction. "You have to pity a poor joke that's in the first draft of a script," says Reiss, "because it's gotta

make a room full of people laugh four or five separate times to make it to the finish line."

By the end of the process, about 80% of the original script will be changed—almost always for the better. "There's no room for ego in this process," says Reiss. "If a writer fights to preserve his original script, he'll probably get fired."

Say no to A-holes

Due to such a collaborative process, success in the writers' room requires a delicate balance of talent and attitude. One irritating or obstinate writer can bring the entire machinery of the show to a halt.

"Long before *The Simpsons*, I worked with a writer who was very talented," recalls Reiss, "but he was also an A-hole (the A is for ass.) The boss called him in and said, 'we love the work you're doing here, but everyone thinks you're an a-hole. So, we're going to have to fire you unless you can, you know, stop being an a-hole.' The guy said, 'let me think about it.' He went home that night and returned the next morning. He said, 'I discussed it with my wife and she agreed—I can't stop being an a-hole.'"

All kidding aside, Reiss said they suffered few such writers on *The Simpsons*. They lost writers who complained about the process and some just didn't work well with others. But mostly, they succeeded because the show is continually staffed with professional comedy writers who take their profession of being funny quite seriously. "People expect our writers' room to be a raucous madhouse, but it's not; it's a serious place of business. Every few years, a news program sends a camera crew to observe *The Simpsons* writers at work, and every time, the crew gets bored, then angry, and storms off without a second of usable footage. This is because our writers aren't clowns or performers—they're introspective, hardworking people who will spend two hours trying to think of a title for an Itchy and Scratchy cartoon."

Keep pitching no matter what

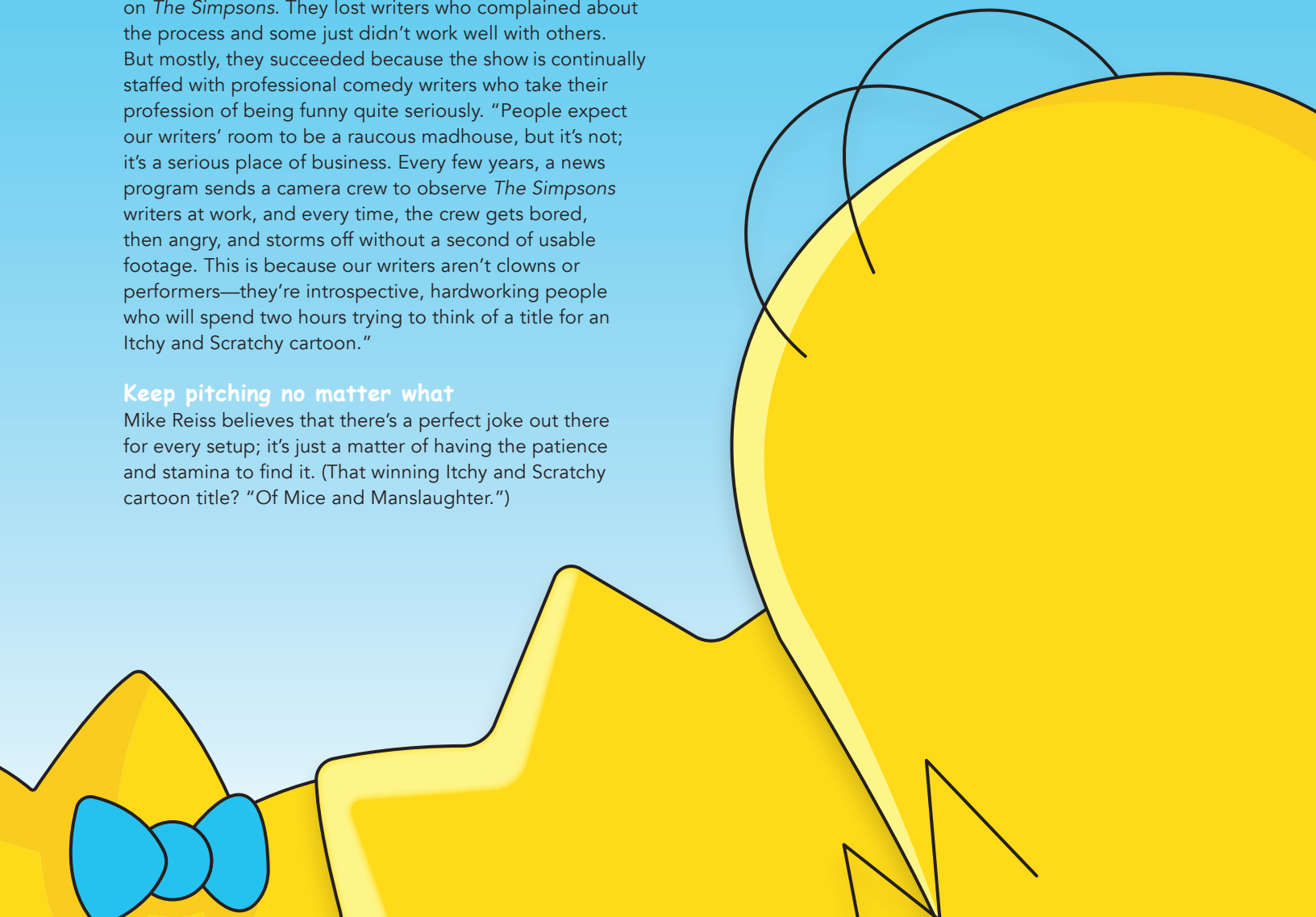
Mike Reiss believes that there's a perfect joke out there for every setup; it's just a matter of having the patience and stamina to find it. (That winning Itchy and Scratchy cartoon title? "Of Mice and Manslaughter.")

"I would sometimes see Mike and Al sit on a joke for an hour," said a young writer on *The Critic*. "If they didn't like the jokes, there were times they would just sit there pitching. Or in silence. For so long. Watching them try to figure out what was strong and what wasn't was how I learned to be a comedy writer." That young writer was Judd Apatow.

The lesson here: Your first idea is not necessarily the best. Neither is your thirty-first. But there is a solution to every problem if you're willing to put in the work and think outside the box. "Just don't say 'thinking outside the box'," says Reiss. "It's a cliché. That's not thinking outside the box."

When will it all end?

These are just some of the reasons why *The Simpsons* has lasted for three decades and is still one of the top-rated shows on Fox. So, when will it all come to an end? Mike Reiss would prefer it if we stop asking. "It's rude. It's like asking your grandma when she's going to die," says Reiss. "She doesn't know, and she doesn't want to think about it."



LEADERSHIP IN THE CONNECTING WORLD

It's a transformative journey that requires bravery and perspective.

We are on the precipice of living in a hyper-connected world, where practically every electronic device we interact with is connected to the vast Internet of Things (IoT), and data is continuously being exchanged. In this Connected World, sensors in our forks will measure the nutritional and caloric content of our food, hologram virtual assistants will organize our activities, wellness monitors will prompt video consults with our physicians, and we'll be conversing with the smart walls in our home.

The signs of the Connected World are all around us, multiplying and innovating all the time. IoT represents a sea change for industries everywhere, and the speed at which IoT and all its related technologies are moving is unprecedented.

So, how many business leaders are taking steps to modify their products or services and prepare their companies to compete in this new, hyper-connected world? Not enough.

Ask Gregg Garrett and Warren Ritchie, authors of the book, *Competing in the Connecting World: The Future of Your Industry Is Already Here*. As the title plainly suggests, the time is now for executives to prepare to lead their companies through the transformative journey toward the Connected World. Or, more precisely, to lead their companies in the connecting world.

"The Connected World, with a capital 'C' and capital 'W,' is the vision of the world fully connected. It's the future world that we may never actually get to," says Garrett. "The connecting world is where we are today. It's a world that's in change. It's in process. The world yesterday was likely a little less connected than it is today, which is a little less connected than it will be tomorrow."

"The speed in which a lot of this change is going to occur means that most companies really can't afford, or shouldn't choose to afford, to wait to start preparing for it," he adds. "This doesn't mean they have to switch their entire revenue model overnight, but if they believe we're on the trajectory of a Connected World, leaders should start preparing their capabilities to operate in this environment. They need to start their transformative journey now."

VALUE AND THE PARADIGM SHIFT

In the connecting world, value creation and value capture differ from what most companies are accustomed to. In this world, potentially more than 50 percent of the value of a product or service will come from how seamlessly it fits into the user's ecosystem. Value is measured in the effectiveness of connections and allowing entities to collaborate and create a unified experience for the user. Consumers realize the difference in value between a thing that's connected and one that's not. Simply, unconnected products won't have the same value to users as ones that are part of a larger integrated ecosystem.

When all products, services, and accompanying experiences are linked, companies must compete in a blended world where product-based ("things") norms, structures, and ways of thinking merge with norms from digital firms ("Internet").

"'Things' and 'Internet' industries each have their own set of economic principles. If you're starting from either end and moving toward the middle, you're going to need to drive out new capabilities and re-architect the underlying mechanics of your company," Garrett says. "The capabilities that have made you successful in the past aren't the capabilities that you can rely on to keep you successful in the connecting world."

The predominant business model of IoT is a two-sided one that's common among Internet-based companies such as Amazon, Facebook, and Google, according to Garrett. On one side are the products and services consumed directly by users. Here, you want to collect and mine product and use data, your IoT data, to ratchet up the value delivered to your customers. The byproduct of this aggregate information leads to the other side of the model, where you seek to monetize your data by partnering with third-party businesses that can integrate your product or service or create altogether new adjacent offerings.

For companies rooted in a world of discrete products and disconnected user experiences, the two-sided model is nothing short of a paradigm shift. (See sidebar: Connected World Brings Technological Discontinuity.)

PUT ON YOUR DANCING SHOES

Leaders can't begin to embrace this fundamental shift in thinking about value if they don't bust down barriers of inertia. There are different flavors of inertia, but one Garrett sees often among executives is dominant logic inertia, or inertia that stems from an executive's tendency to repeat the decisions and behaviors that have made him or her successful.

Garrett harkens dominant logic inertia to an awkward middle school dance, when you mustered the nerve to ask your secret crush for a dance. The music started to play and you probably did your best two-step hustle. At the end, you even got a kiss on the cheek. And from that day on, every time you dance it's similar to the dance you did in middle school. Why? Because it's what you know, and you were rewarded for it. It worked.

"But leaders need to ask themselves if the music has changed," says Garrett. "If it has, will they get the same result, or do they need to change their dance moves to find the new beat?"

Executives can't follow the same playbook in the Connected World, even if it's been wildly successful. Unrecognized, dominant logic inertia can prevent executives from acting fast enough in a competitive arena. By the time they realize the music has changed, it's too late.

WALKING A WELL-TRAVELED PATH

The Connected World is bursting with possibilities and opportunities for businesses. It's also shrouded in mystery because we can't predict what life in a connecting world will be like entirely. Executives need to envision how customers, businesses, or other users will experience their products or services in the future. It's a challenging, if not scary, proposition.

Garrett wants executives to realize, however, that they're facing the same type of technology disrupting patterns and strategic themes their business predecessors faced decades ago.

"Think if you were an executive when steam power was harnessed for the first time. What if you were running a company in New York before the internal combustion engine was invented and then continued to run it afterward," he says. "Going from the horse and buggy to the automobile required learning an entirely new and foreign technology. The transportation and ancillary markets were completely transformed, and you had to decide how your company was going to compete and which capabilities were needed to make it happen."

Leaders in the Connected World aren't the first to take a transformative journey like ours, notes Garrett. They just need to be brave and start moving.

Referred to by readers as a "field guide for business disruptors," the best selling book *Competing in the Connecting World* offers a proven framework and approach to assist leaders in understanding, preparing, and bravely transforming their firms to thrive in the digital era.

Bio: Gregg Garrett is the CEO and Managing Director of CGS Advisors LLC, a boutique strategic transformation and innovation advisory firm. Previously, Gregg served as chief strategy roles in the Volkswagen Group and Deutsche Telekom and was part of Ernst & Young's Management Consulting Practice. Gregg is an experienced international keynote speaker, lecturer, and author of a best-selling business leadership book. He can be reached at greggory.garrett@cgsadvisors.com

THE CONNECTED WORLD BRINGS TECHNOLOGICAL DISCONTINUITY

One-off connected features are baby steps, insufficient to get a company where it needs to go to be competitive in the Connected World. For a complete transformation to take place, Garrett and Ritchie purport in their book, leaders must fully understand the IoT and the end state of a Connected World to be a technological discontinuity that is disrupting all industries.

Technological discontinuity occurs when a new technology offers superior benefits over an existing technology, breaking its dominance. This discontinuity drives the need for businesses to consider new strategies and capabilities, often forcing organizational transformation. Some companies move faster than others. It's the differences in efficacy and speed of reaction that leads to industry disruption.

In the connecting world, leaders who fail to transform their companies by acquiring the necessary new capabilities will not survive.

Leaders can start by deciding where they'll focus their business capabilities. The following questions are a great launch pad:

- Will you decide to offer a connected experience, or supply a product or service to a company that does? (B2B supplier)
- Will you offer connected products, services informed from connected products, or both? How complete of a set of services will you offer, and how important will products be to the strategy?
- If you offer your connected experiences to the end user, will you solely monetize product-in-use data to the users, or will you develop a two-sided platform that has distinct users and separate customers who buy access or insights about the users?

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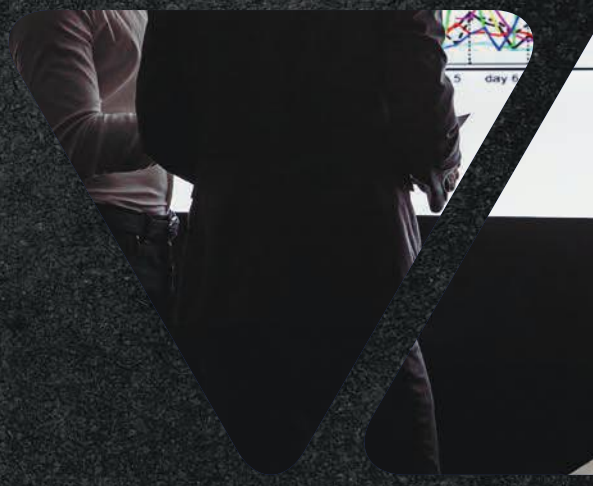

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IN THE DIGITAL AGE IT'S ALL ABOUT PEOPLE

Technology is empowering companies to change dramatically, but don't forget the people that make it all worthwhile.

As companies undergo digital transformation, they often focus most on the evolving technologies that are making that transformation possible. It's easy to see why—the Internet of Things, artificial intelligence, machine learning, automation and so on are exciting and have the potential to change work (and the world) as we know it. But by focusing on the technology itself, organizations might lose sight of the true power of transformation: the ability to create more meaningful human experiences.

Speaker, author and technology consultant Kate O'Neill says the secret is using all of that exciting technology as a means to create those meaningful experiences. Her latest book, *Tech Humanist: How You Can Make Technology Better for Business and Better for Humans*, is helping business leaders across the world rethink what digital transformation really means, and embrace a new, more human-centric approach.

"At its heart, digital transformation is about people and helping them do what they need to do, faster, easier and more efficiently. The technologies are simply tools that help companies get there," says O'Neill. "We need to be thinking much more broadly about how human experience is impacted by all kinds of technologies, and especially the emerging technologies that have so much capacity and scale in them."

O'Neill began her tech career in the Wild West of the early 90s, when people were simply exploring and experimenting to see what the internet and web could become. From the start, it was clear to her that not enough thought was going into how things worked for the humans using the technology. "People talked a little about usability back then," she says, "and human-computer interaction was a rudimentary discipline, but it wasn't well understood. Today there's a lot more awareness of and interest in the user experience. The discourse is maturing."

But there's still a long way to go.

That's why O'Neill wrote her book and why she spends most of her time now helping CEOs and other corporate leaders think about their challenges in a new way and put them into a human-centric digital transformation framework. It goes far beyond thinking that, "IoT is all the rage, so we have to think about our IoT strategy now." It's all about how to put the human experience at the center of their digital transformation and why it's important to make those experiences more meaningful.

What Does 'Meaningful' Really Mean, Anyway?

To O'Neill, meaningful experiences are those that have depth and memorability, that are significant because of how they transcend or complement their context. Technology exists to make our lives easier and more enjoyable, but it often does just the opposite. Think of all the frustrating tech support calls you've made, or online help instructions you've tried to follow. Now think of a time where you got exactly what you needed in a timely manner and the process was painless and allowed you to print that invoice, order that widget, set up that wireless router—and move on with your life. That's memorable. And meaningful.

As businesses progress down the digital transformation path, they often cite improving the customer experience as one of the benefits of that transformation. That's a valid and worthy objective, but it's just one step on the human-centric highway. O'Neill says, "In order to really appreciate the fullness of where a company and where a brand sit in the world and how its experiences intersect with the real human experience, we have to think beyond just the moment when someone is functioning as a customer."

In human-centric digital transformation, an organization takes into account all the people they interact with, not simply customers within a specific purchase cycle. Employees are humans, partner companies are made up

"By focusing on the technology itself, organizations might lose sight of the true power of transformation: the ability to create more meaningful human experiences."

of humans, and an organization's choices and behavior can even affect humankind at large.

Even the people who may become customers in time are not all the same. Think of someone who's checking out your website on a tablet in the middle of a city sidewalk versus someone who just got an email on their smart watch while in a meeting at work.

"The more you can think of the human perspective across the whole spectrum of their experiences throughout the day and the context in which they have those experiences," says O'Neill, "the more possible it is to design experiences that mesh with those realities and provide things that actually add some utility and convenience to people and give them something that's more meaningful in their lives."

It All Starts with a Well-Defined Purpose

You can't transform your company without a clear sense of direction, which then helps you know whether you're setting the right priorities and making the right calls. The first step, says O'Neill, is defining your organizational strategic purpose.

"Most companies are in business for some reason other than to make money," she says. "A strategic purpose brings them back to that grounding and gets them thinking more in terms of, 'How do we make the world just a little bit better in this one very specific area?' When they can align the rest of the organization around that, then they can deploy technology—whether it's IoT or AI or automation—in a way that aligns with that and amplifies that mission."

Your purpose statement should include what it is your company is trying to do, and what it's trying to do at scale—distilled down to three to five words. Sound tough? It can be, but by doing the work you'll see how every word matters and has to actually represent something pertaining to your values and to why you're in business in the first place. It forces you to jettison everything else that's muddying that picture of what your company is and what it wants. The result is an ultra-clear idea that informs how and where to proceed with your digital transformation.

Your purpose statement should inform and drive every decision and every interaction throughout the organization. It should be the foundation of your priorities and strategies. And most importantly, it should be infused throughout your brand and company culture and operations at every level.

Holding to Your Purpose Transforms Brand and Culture

The next step is holding your purpose statement up against a list of your organizational priorities for the year, the goals you've articulated, and the strategies you already have in place for getting things done. Many companies, once they measure their newly created purpose statement with their existing strategies and goals, realize that they've been making decisions that haven't necessarily been in line with their purpose—that perhaps they were a bit off the mark or missing opportunities to deliver the best experiences to their customers, engage their employees to the fullest, most effectively model data to get the most critical insights, or use technology to achieve their objectives.

Company culture can begin to shift when employees understand that central strategic purpose and begin to act that out more in their interactions with customers and each other.

"Getting clear and succinct on your purpose can inform not only brand, culture and experience strategy," says O'Neill, "but also data modeling and operations and technology deployment that amplifies and accelerates that purpose. So the entire organization becomes more efficient, more effective, more aligned. And as a result, that sense of purpose, and what your company exists to do and is trying to do at scale, creates a more fulfilling, more meaningful sense of interaction between the company and the customer rather than something that's fleeting and motivated only by money."

Use Data for Intelligent Transformation

When we talk about digital transformation, says O'Neill, what we're mostly talking about is data—the way data makes the organization smarter, more connected, more transparent. And by and large, that information is human data. It's the data that represents the interactions, interests and preferences of real people as they go through their daily lives.

> "The amount of respect an organization shows for that data is made clear in the way it approaches and designs experiences from that point forward."

"The amount of respect an organization shows for that data is made clear in the way it approaches and designs experiences from that point forward," O'Neill says. The opportunity is in gleaning valuable insights from the data and making changes to align more effectively with your strategic purpose statement as well as with what people want.

That takes an organizational attitude adjustment or strong leadership that can guide the company through that process and ensure that everyone is willing to take that learning approach and maybe change the ways things are done—all to make sure that there's as much alignment as possible between the company and the humans that interact with that company.

Happy Humans Affect Your Bottom Line

Simply put, companies that are able to design meaningful, human-centric digital experiences are reaping the rewards. When you make your organization memorable in a positive way and make people's lives easier and more enjoyable, it's not only profits that tend to increase. Employees are more content in their work, they're more loyal to the company, partner companies strengthen partnerships with more projects and opportunities, board members like the reports they see, and anyone who interacts with your company comes away better for it.

O'Neill holds out a lot of hope for future success in human-centric digital transformation. "There are so many ways that technology can make human life better," she says. "It's just a matter of using it correctly, encoding the right values into the algorithmic decision-making and ensuring that we're making decisions on behalf of the most people who can benefit from it. And of course I think that's possible to do in a way that aligns with business success. That's the only way it's going to take and scale."

In the past, it was too easy to define digital transformation by the benefits it would bring your organization—more agility, faster time to market, more opportunities to innovate, more streamlined operations. But it's about more than just your company. When you put those benefits into service of improving human experiences by saying, for instance, "more agility, faster time to market, etc., in order to [insert strategic purpose statement]," everyone wins.

The Power of Purpose

One of O'Neill's favorite examples of a succinct, successful purpose statement comes from Disney theme parks, which is to "create magical experiences." Those three words convey a very crisp understanding of a branded culture and approach to how Disney works.

If that statement is truly understood and believed throughout the organization and employees are granted autonomy to follow through in the most relevant way necessary to ensure that they're creating the most magical experiences, then everyone in the organization—no matter who they are and no matter what job they have—knows how to solve any problem brought to them.

Photo Credit: Robbie Quinn

AI: The Fear, the Bias, and the Rewards

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ROBOTICS HAVE HUGE POTENTIAL TO ENHANCE HEALTH, CULTURE, AND CIVILIZATION. BUT ONLY IF WE CLAMP DOWN ON ACCOUNTABILITY FOR MAKING SURE LEARNING MODELS ARE BUILT USING THE RIGHT DATA.

BY AYANNA HOWARD

Whether robots are friend or foe to humankind has long been debated. We have sci-fi writers and Hollywood to thank, in part, for both sides of the argument.

Indeed, there are some fairly disheartening dramas—think *Westworld*, *Blade Runner*, and *The Matrix*—that depict a dystopian future in which machines take over, leaving the joys and splendor of civilization in the dust.

At the same time, however, long-ago classics such as *The Jetsons*, the *Star Trek* TV series, and *2001: A Space Odyssey* inspired several generations of humans to dream big. After percolating for decades, many of those dreams are now becoming realities, and they're largely making the world a better place.

BEYOND SCIENCE FICTION

If not for the Starship Enterprise's holodeck, for example, would we have virtual and augmented reality helping us model and design buildings? Or providing a safe but realistic way to teach risky medical procedures? It's hard to say.

But there's no arguing that AI and robotics are enriching our world in countless ways: from allowing paraplegics to stand up and walk to helping reduce highway fatalities to exploring Mars as an alternative habitat for humankind.

What got me personally dreaming about what good technology could do was The Bionic Woman, a mid-70s TV show about an injured woman who gained extraordinary powers through artificial limbs. I decided then and there, between the ages of 11 and 12, that I wanted to create artificial limbs for people, too. I planned to go to medical school, but I soon discovered that biology—especially dissecting harmless, innocent frogs—wasn't my ideal cup of tea. Then I heard about engineering and realized that, if I became an engineer, I could do exactly what I wanted to do and build robots of the future, without the squeamish stomach.

Today, I design robots that help improve the lives of children in a variety of ways. But while I'm focused on how technology can make the world better, I also know that any new technology can be used not only for the noble but for the nefarious. A car can be a means to independence, employment, and leisure. But it can also be used as a killing machine.

HOW BIAS CREEPS IN

The ethics of what we create and how we develop it play a huge role in identifying what we call AI or robot bias. Those working towards a common good attempt to eliminate that bias the way we would in other aspects of society involving human decision-making processes, such as in our hiring processes or in the criminal justice system. But we're not always successful. Bias can still sneak into the data we collect as we train deep-learning models, for example, or in the process of selecting attributes from the data for the algorithms to consider.

Stories of AI missing the mark abound. Some are comical, as in the case of wayward GPS systems. One recently caused a driver in Indonesia to drive off a cliff (he survived); in an older, scarier, incident, a bus in Washington State carrying a high school baseball team crashed into a wall while following GPS instructions. These mishaps occur when the data used in the modeling is the wrong data. For example, the data in these cases assumed a certain size vehicle when in fact the vehicles were larger and required a different route.

A prominent example of an AI project-gone-awry because of unintentional bias was an automated recruitment program that Amazon had to scrap. It was reported last fall that Amazon had been training its computer models to vet job applications based on a 10-year history of successful hires. But most applications from that 10-year period came from men, a reflection of the long-standing gender gap in the tech industry.

The data scientists on the project had simply overlooked this aspect of their data, and, as a result, Amazon's computer models were in effect being trained to filter out women. That wasn't the company's intent. So, it was back to the drawing board for Amazon.

AI AND ROBOTICS: TWO SIDES OF THE SAME COIN

AI and robotics are inextricably linked: I think of AI as the "brains" of the operation, while the physical robot is the "body" that carries out the work as instructed by the brain. And now that we have virtual robots—such as avatars in online worlds and disembodied digital assistants, such as Apple's Siri and Google's Alexa—the two disciplines have truly blended.

To work, as mentioned, AI and robotics need the right data—data that's been collected, prepared, and programmed in the context of a goal. And this is where different levels of AI bias can enter the picture.

We have to be careful that the objectives we set are ethical objectives. That the data we collect reflects reality (where the Amazon recruitment modeling broke down). It might not work, for example, to create a model based on data collected in California, apply it in Georgia, and expect it to work. And, finally, we need to be careful that the attributes the AI algorithms consider in calculating a prediction or an action aren't biased, either in terms of

the attributes we choose for the algorithm to consider or the attributes we choose to leave out.

PERSONALIZATION, PROFILING, AND PRIVACY

All these considerations dance around a fine line between using data for personalization—which most of us seem to want—and profiling, a word that now tends to make the hair on the back of people's necks stand up.

Nearly all the things we want AI to do for us today is about personalization, whether we're asking Siri to place a phone call, Alexa to play a song, or Waze to get us to our intended destination. Or we might be building an exoskeleton that will allow a paralyzed person to walk. Irrespective of the use case, getting the right result is all about programming the right data for the individual at hand.

And for successful programming, we have to make some generalizations. For example, if data about me says I'm a Georgia Tech professor on email till 10 p.m. every night, a marketing system might assume I'm a coffee drinker and target me accordingly. That could benefit me.

But when do we cross the line between "profiling" for everyone's benefit and making assumptions and generalizations that could offend, invade someone's privacy, or even do harm?

These are early days, and these lines of demarcation have not yet been fully drawn. But erroneous assumptions can result in AI bias, and that can have all kinds of unexpected consequences. In 2018 alone, for example, AI bias has caused immigrants to be erroneously deported, unsafe cancer treatments to be recommended, and an "ethnicity detection" feature to be created to search faces in New York City based on race without citizens' knowledge or permission.

These weren't AI's finest hours.

PAYING FOR 'FREE' SERVICES WITH YOUR DATA

However, individuals have a role to play, too. If you're online and use a free service—whether it's Facebook, Amazon, LinkedIn, Google, or some other digital entity—you've already given up much of your privacy. Most of us say we want our privacy, but are we willing to pay for it? For example, if Facebook started charging $19.99 a month to guarantee user privacy, I don't know how many people would do it. We seem more willing to pay with our data, than with our dollars and cents.

As it stands today, we're basically giving these digital giants permission to use our information by clicking "I accept" at the bottom of a long list of terms and conditions. We can choose not to use any of these services, of course. We can choose not to read the news for free or call another country for free or find job opportunities for free. But are we willing to give up these capabilities to protect ourselves?

Fortunately, the level of consumer privacy responsibility assumed today by big digital companies is coming under scrutiny. It began with the General Data Protection Regulation (GDPR) last year in Europe. Now, in the U.S., the Social Media Privacy and Consumer Rights Act of 2018, proposed last spring, is under advisement at the U.S. Committee on Commerce, Science, and Transportation, which conducted its first hearing on the subject on Feb. 27 of this year. In addition, several states, including California, Washington, and Massachusetts, have been drafting their own privacy legislation in the absence of a federal privacy framework.

IT'S JUST THE DATA TALKING

In addition to their potential to invade your privacy, robots make people apprehensive because they think robots truly understand them. Rest assured, they don't. When a digital assistant or a robot takes an action that's eerily personal, it's not because there's a machine reading your mind. It's because the right data has been entered into the computing model to return the desired result.
I work with robots that help children. A robot might be playing the role of exercise coach to a child who needs to move around more. There's more to it, though, than the robot performing the exercise that the child should emulate.

The robot needs to have characteristics that will get results the way an authority figure—such as a parent, gym teacher, or even a friend—would. That means that I need

ABOUT THE AUTHOR:

Ayanna Howard is an American roboticist and Chair of the School of Interactive Computing at Georgia Institute of Technology. She's also the founder and CTO of Zyrobotics, LLC, a company that focuses on applying technology in ways that enhance the quality of life for children. Howard holds three patents, and among her many awards are: Brown Engineering Alumni Medal (BEAM), 2016; AAAS-Lemelson Invention Ambassador, 2016-2017; and Forbes' America's Top 50 Women In Tech, 2018.

Howard says her favorite robot of all time is Rosie, the frilly maid from "The Jetsons" cartoon.

to create "emotional AI," whereby the kids want to please the robot, just as they would a friend or teacher.

As in real life, the robot exercise coach will become "frustrated" or "pleased" with the child based on his or her performance and stick-to-it-iveness. But though it might seem that the robot is doing all the thinking on its own, it's not. It's just the data talking.

AI'S EFFECT ON THE FUTURE OF WORK

There's no question that AI will change the future of work. Some changes are obvious: a dangerous or dirty job once performed by a human will be handled less precariously by a machine. Other changes are more subtle. If truck drivers are replaced by self-driving vehicles, there will be fewer fatalities on the highways caused by long-haul truckers falling asleep at the wheel. On the other hand, there are small cities along well-worn truck routes that survive on truckers stopping for gas, food, lodging, and other services. The fallout of that shift in the job landscape has yet to be calculated.

In the financial trading market, more AI researchers and data scientists are going to be hired than stockbrokers. If I'm trying to figure out what to invest in, there's so much more data now to consider, it's overwhelming. There are the traditional sources of data, but then there's public opinion via Twitter, information from Congressional hearings, and so on. It's impossible to consider it all without some AI modeling. We may still need a stockbroker to interact with the investor, but we'll need more AI and researchers at the back end.

And while the World Economic Forum anticipates that robots or some form of automation will conduct more than half of the work performed on Planet Earth by the year 2025, the organization also says that automation will create twice as many jobs as it eliminates. We have yet to fully envision where these jobs will come from.

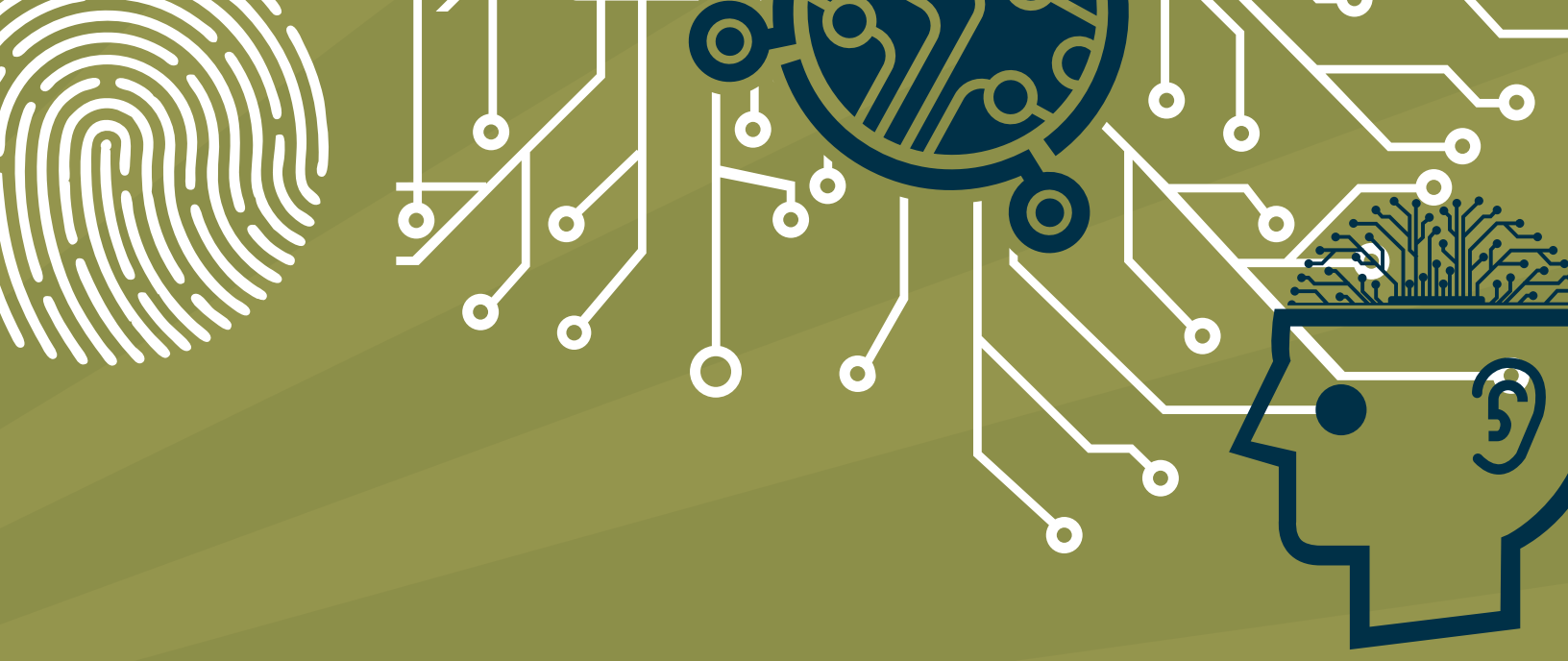
DEMOCRATIZATION OF EDUCATION THROUGH AI?

I believe that as companies bring in new technologies, they'll also create the necessary training to develop worker skills and build a competent workforce. But the shifting job landscape will also affect traditional academia. We've come to a point in time where all college students should have at least a Computer Science (CS) 101 education.

Now, there's likely to be a shortage of instructors to teach CS 101. So, I believe we might be looking at the democratization of education through AI. In other words, I envision academic environments in which robots are called upon to teach CS 101 classes to the student masses.

Getting this education is important, because AI is here and it's going to have a big impact on our lives. In February, U.S. President Donald Trump signed an executive order asking federal government agencies to dedicate more resources and investment into research, promotion, and training on AI. It's partly a defensive move: there could be negative intent by others using AI. If they're investing in it, and we're the good guys, we have to invest too. Otherwise, there will be an imbalance of power, weighted toward those who might want to use it against us.

Just as important is harnessing AI and robotics to advance humankind—whether that means robotics applied to improving human health, conquering space, or something else. Reaching our desired milestones requires that we exercise ethics and execute governance for AI accountability to help make sure we use the right data and prevent biases creeping into our models to avoid AI mishaps.



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FEAR OF CHANGE OR FEAR OF FAILURE IS A STRONG INDICATOR FOR THE NEED TO UNLEARN.

LIFESTYLES

HE'S THE MOST INTERESTING MAN IN THE WORLD

No beer ads here: Meet the dauntingly daring and beneficent **Sir Ranulph Fiennes**

Sir Ranulph Fiennes has spent most of his life pursuing and achieving record-breaking expeditions to both poles and to the highest mountaintops, all in the name of raising money for medical research.

He has raised an astonishing $25 million for medical research—primarily cancer—by seeking one harrowing, record-setting expedition after another.

"To get big sponsorships and maximize fundraising, you have to set records," he says. In his case, these records have included being on the first team to reach both poles—the first to cross the Arctic and Antarctic oceans, and the first to circumnavigate the Earth along its axis poles—all 52,000 miles of it—over a period of three years.

With his late wife, he led a team that discovered the lost Southern Arabian city of Ubar after 25 years of trying to find it. At age 58, after suffering a massive heart attack and a double bypass, he ran seven marathons in seven days, just three and a half months after surgery. After several tries, he successfully summited Mt. Everest at age 65, becoming the first OAP—old age pensioner—to do so. For these and other adventures, including his sterling military record in the British SAS, Sir Ranulph has reaped scores of awards, honors and degrees. He's written numerous best sellers including Killer Elite, *released as a major movie with Robert De Niro.*

He even dabbled in surgery. After four fingers and his thumb were badly frostbitten on an Arctic expedition, he grew impatient awaiting surgery to relieve the great pain he suffered. With his late wife's prodding—"She said I was getting irritable," he says—he undertook the partial amputations himself, which later, he said, a plastic surgeon would "tidy up."

NEXT Magazine recently interviewed Sir Ranulph by phone at his UK office. Here's what he had to say:

Q. At 74, what are you doing for excitement these days?

Sir Ran: I'm retired, but as usual, I have a book to write for a publisher. I'm writing a book called *Shackleton*, about someone who led three British expeditions to the Antarctic.

Q. What can you write about him that hasn't been written many times before?

Sir Ran: The publisher said they wanted me to write the book because all the Shackleton books have been written by historians who've never been anywhere colder than normal. Instead I will put in my commentaries of having been in the same areas as him, doing the same thing as him with largely the same gear. A little bit later than him, maybe 50 years later, but I did it like Shackleton in many ways. I had no polar orbiting satellites to fix my position or GPS of any kind. Navigating for me was exactly the same as with him, using starlight and a sextant.

And using the sun and its position, and taking the time from a non-digital watch, just like Shackleton. The difference of falling into crevasses was the same, unfortunately; and the amounts of food you can carry before you feel very hungry haven't changed much. However, he didn't manage to cross the Antarctic continent, and we did. We did the first open vehicle, single team crossing of Antarctica in 1992. And we did the first unsupported crossing of Antarctica as part of the first-ever journey vertically around the globe in 1982.

Q. You've explored the most remote, vast oureaches on Earth. Ever have any interest in exploring outside our planet?

Sir Ran: No, not at all. I didn't even pass mathematics or anything else like that! I don't speak Russian either. When I was asked about 15 years ago if I'd like to be on a training course for the possibility of going into space, I immediately said no. I would never have the intelligence to handle such science, other than a text message into my 13-year old Nokia. I don't send emails. I receive them, because it's only pressing one button on the tablet. And then I write out in handwriting the reply and ring up my secretary down the next floor and she sends the email off. I'm a dinosaur.

Q. What's the most beautiful thing you've seen in nature?

Sir Ran: That would be on the top of Mt. Everest looking down in a full moon situation with the Sherpa, and seeing the melon-colored tops of all the clouds down at 20,000 feet. And seeing the black peaks of mountains spearing up through those moon lit clouds. Yeah, that was pretty good.

Q. Which of your adventures and acheivements are you most proud of?

Sir Ran: Along with my late wife, I spent 26 years looking for a lost city (Ubar) in the Empty Qatar Desert before we finally found it on the 8th attempt in 1991. We looked on and again for that city for 25 years, between other expeditions. I am most proud of that because it took so

long. The two of us went back again and again. We didn't accept defeat.

Q. What did that and other adventures teach you about perseverance?

Sir Ran: If you can't climb Everest on the Tibetan side, you might as well have a go on the Nepal side. And then you still find you can't do it, so you take a different Sherpa with you who's got a different way of guiding you. And up you go. So on the third attempt, by which time I was 65, I mean it was pretty easy and I became the oldest person to summit Everest. But I was able to work out why I made such a mess of it twice previously. The fact that when I got up it I was 65 meant that I could raise a lot more money for cancer because I was the first old-age pensioner up, which I wouldn't have been if I'd succeeded the first couple times.

Q. Was there a failed adventure you wished most you had succeeded in?

Sir Ran: Yes, I tried crossing Antarctica during the winter between the two solstices. But that proved too difficult.

Q. What did you learn about leadership in these expeditions—what can we learn?

Sir Ran: I suppose that you can get almost fascist-like when you really have to, but if you can pretend to be democratic, it's a good thing.

Q. Pretend to be democratic, what do you mean by that?

Sir Ran: I mean if in the morning you wake up in the tent and you look out and see you've got a glacier you have to head down and it's got big snow drifts on both sides. I would just know there's a crevasse under there crossing from rock wall to rock wall. I'd have the confidence to know that I'm better than anyone else determining which is the best way across. So I'll say, "Boys, we are going across the great crevasse field today and we're going to the left over there, take a bearing off that mountain, go down a bit and across a bit." But if I look out and see it really doesn't matter how we cross that glacier, I'll say, "Now boys, we're going to have a democratic decision as to where you think would be best to cross this crevasse field."

Q. You must have had moments where you felt, "I could die."

Sir Ran: In the military yes, when getting surrounded in enemy area. But on expeditions, no. I can't remember anything like that apart from maybe once climbing on the north face of the Eiger [a treacherous Swiss Alps peak]. I sort of got vertigo on a very exposed face, so that was quite frightening. But normally on expeditions, no.

Q. What's your greatest fear at this point?

Sir Ran: It would be connected with old age, being unable to physically do things or even go for runs. Every-

one deals with aging, but a lot of it can be in your head, as the saying goes. You can just decide that you're going to do 24 pushups before breakfast every day, or maybe some squats. Or you're not going to bother and you're just going to let time and gravity take their course. But it's in the individual's determination. It's quite possible to fight off a lot of aging.

Q. You've had a front row seat to observe what, if any, are the effects of climate change. What have you seen?

Sir Ran: Really nothing in the Antarctic, but definitely in the Arctic. Oh yes. I mean in the '70s, while designing our sledges, we would make sure they were made of waterproof material in case there was the occasional canal. By the '90s we were designing basically canoes that could be pulled. All that within 20 years.

Q. Has there been a single greatest source of inspiration in your life?

Sir Ran: Yes, my mother. When my father died [in combat in WWII right before Sir Ran's birth], she was left with four children to look after. We went out to South Africa and she looked after all of us very, very well indeed. She managed to get us well schooled and so on. And she had some pretty hairy moments out there, things I witnessed. Mum was a big inspiration.

Q. What of your equally adventurous late wife, who joined you on some of your expeditions?

Sir Ran: I met her when she was 9 and I was 12, and I took her out when she was 13. And didn't marry her until she was 21, and we stayed married 38 years until she died of cancer. She was the brains behind the expeditions. At times when I thought we were going to have to give up, she would say no, we've got to carry on a bit longer. No, she was a rock.

Q. Are there still things to explore, horizons to go after and adventures that are out there?

Sir Ran: Oh yeah, I mean everyone's got their own exploration. It doesn't have to involve finding a lost city or chasing the beginnings of a river. There are still mountains with north faces that have yet to be summited. Also, explorers can go deep into the Brazilian jungle where maybe someone may have been before, but not with the same knowledge and information and instruments available today. They can come out of that jungle with new medicines or some previously unknown plants.

Q. Twenty-five years from now, how would you like people to describe you?

Sir Ran: Simply without bitterness.

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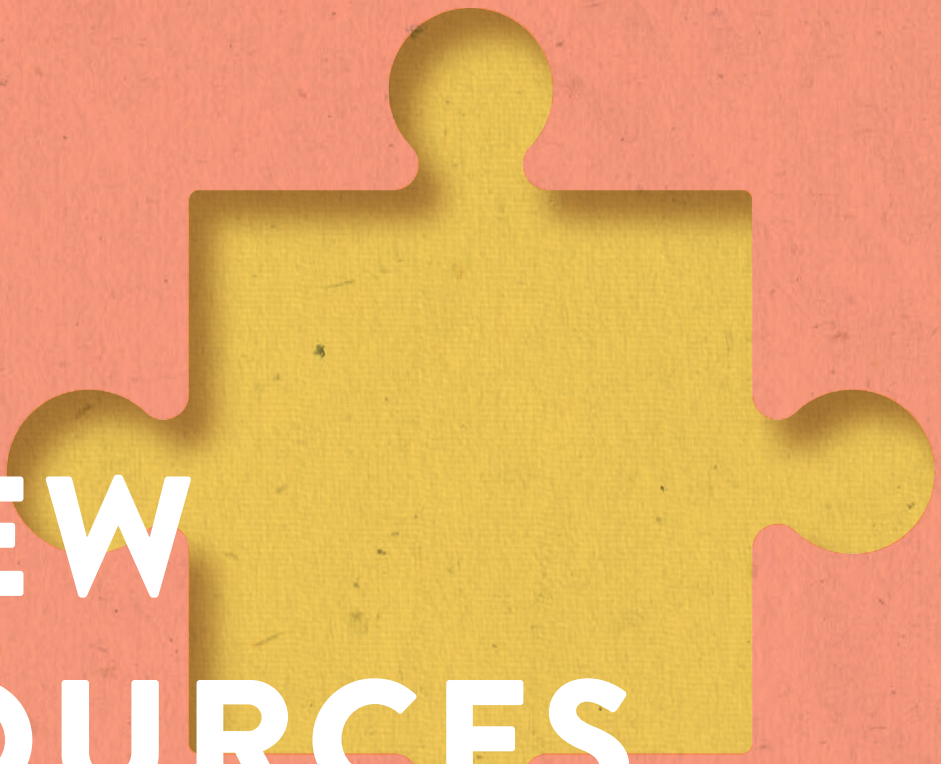
IN ADDITION TO THEIR POTENTIAL TO INVADE YOUR PRIVACY, ROBOTS MAKE PEOPLE APPREHENSIVE BECAUSE THEY THINK ROBOTS TRULY UNDERSTAND THEM. REST ASSURED, THEY DON’T.



NEW SOURCES OF TECH TALENT

Right Here at Home

Tapping the growing resource pool of disabled workers is helping progressive companies bridge the IT skills gap. In exchange, they're providing the underemployed with rewarding work and a hopeful future.

A perfect storm is brewing in the U.S. tech industry. It converges the IT skills shortage, the rise of corporate diversity programs, and a growing desire to keep workers on U.S. soil instead of outsourcing jobs overseas.

Blend these trends with a dash of the inclusion movement sweeping much of the country, and you just might find yourself soon operating in a new business climate that harnesses strong talent from a once-untapped source: the disabled.

About 37% of non-institutionalized disabled persons, aged 21–64, were employed in 2017, according to Cornell University, which compiles U.S. disability statistics. Efforts to improve that statistic are actively underway in a number of companies, among them Skills Inc. in Washington State and Aspiritech in the greater Chicago area.

Many individuals, such as those on the autism spectrum, with hearing impairments, and with other disabilities, were once deemed unemployable. But many are now finding good-paying jobs in these and other progressive, inclusive companies, which are capitalizing on their special talents, offering them chances for advancement, and becoming more competitive in their fee-for-service offerings in the process.

UNIQUE SKILLSETS

Skills Inc. and Aspiritech are cleverly matching disabled workers' unique skillsets to critical jobs for which they're better suited than traditional employees.

For example, some on the autism spectrum have an ability to concentrate for extremely long periods of time on repetitive tasks and to see details that others cannot, says Ed Hammond, IT manager at Skills Inc. That makes them great candidates for jobs such as software coding and debugging, hardware testing, manufacturing, and parts assembly, he says.

Some Skills Inc. employees, for example, test Xbox consoles, Skype, and other Microsoft products for defects or usability issues, says Hammond. It's important work—making sure the services and products that people rely on everyday operate the way they expect them to. And not everyone excels at it.

"The thing about people with autism is that their brains work differently. And in terms of software, they work better," says Brad Cohen, a former commodities trader and founding member of Aspiritech, which focuses on hiring people on the autism spectrum for software QA. "Why not cultivate that?"

The U.S. Bureau of Labor points out on its website: "On a daily basis, people with disabilities must think creatively about how to solve problems and accomplish tasks. In the workplace, this resourcefulness translates into innovative thinking, fresh ideas and varied approaches to confronting business challenges and achieving success."

Companies like Skills Inc. and Aspiritech couldn't agree more.

> **"The wave of the future is toward inclusion, whatever your shortfalls are. Who doesn't want a world where people are accepted?**

In addition to providing QA services, Skills Inc. is also one of Washington State's largest aerospace suppliers and one of very few companies that both fabricates and finishes parts. Started by a grant from Boeing in the 1960s, the company strives to employ 60 to 70 percent disabled workers out of a 600-person workforce, says Hammond.

One way the company achieves that goal is through its aerospace internship program aimed at high school seniors at risk of dropping out or in special education programs.

SECRET SAUCE FOR SUCCESS

Hammond recounts the story of Seth, a troubled high schooler on the autism spectrum who loved technology and was brought in as an intern to scan documents. He did so well that "he's now in charge of an entire site as a PC technician," says Hammond.

Meanwhile, Don, a deaf quality engineer, has become the go-to guy on the manufacturing floor. "If anyone has a problem with a part, Don will figure out how to fix it. Everyone counts on his input because of his level of experience," says Hammond.

For its part, Aspiritech is one of the fastest growing tech companies in the Chicago area. In the past three years, it has increased revenue by nearly an order of magnitude, from about $400,000 to nearly $4 million in 2018. Cohen adds the company is likely to hire 50 to 60 people this year, bringing its employee count to about 200.

Employee advancement is one of the company's measures of success.

"We've had 12 people move on and join other companies, including Apple," says Brenda Weitzberg, Aspiritech executive director and cofounder. "But people have grown within the company too. Eight of our senior QA analysts came up through the company," she says.

Such successes don't come without employers making some special accommodations for their employees. Both Skills Inc. and Aspiritech provide complete training and on-the-job coaching and emotional support. Skills Inc. also has onsite interpreters and video phones to ease the work lives of those with hearing impairments.

Cohen calls this extensive on-the-job support the "secret sauce" of an inclusive workplace. The emotional support can come from superiors and colleagues as well as from on-site social workers and autism specialists, who are trained in helping employees adjust to the expectations of office life.

"One kid tests software all day long with a life-size teddy bear on his lap," observes Cohen. "That might be impossible for the rest of us to do. But it works great for him."

REINVESTING IN EMPLOYEES

As nonprofits, both companies reinvest any profits back into employee vocational programs to further their goals of worker success. That includes creating social programs for their employees to help assimilate those new to working or accustomed to working in isolation. Such programs can help improve their chances of advancement and someday possibly running their own projects.

For example, Aspiritech has something going on each night of the business week, whether it's a movies night, coding club, gaming night, or other activity, and a weekend event such as a ballgame. Anyone on the autism spectrum is invited to these activities, employee or not, Cohen says. Skills Inc.'s Hammond says his company hosts similar programs.

Both companies have goals to see employees make it as far as they can within—or outside—their respective companies and to continually increase the amount of money they make.

"We want to embrace people who can work here as opposed to sending work overseas," Cohen says. "If it takes support to manifest that, so be it. Everybody is better off."

> **"On a daily basis, people with disabilities must think creatively about how to solve problems and accomplish tasks. In the workplace, this resourcefulness translates into innovative thinking, fresh ideas, and varied approaches to confronting business challenges and achieving success.**

PROOF IN THE PUDDING

A few inflection points allowed Aspiritech to get to where it is today—which includes serving customers such as Bose, Empire Carpet, JPMorgan Chase, and others. The company was founded about 10 years ago by Weitzberg and her husband, Moshe, parents of an autistic son who was a college graduate but was having trouble obtaining and maintaining employment that fit his education and strengths.

Most Aspiritech customers start out with pilot programs on small projects until they feel comfortable that they're getting top-quality service. For example, OptionsXpress, a leading online discount brokerage firm that has merged with Schwab, initially asked Aspiritech to test mobile applications on its options trading website.

"I jumped at the chance," says Cohen. "I'm a trader and I [understand] OptionsXpress, so I could train our people. It astounded me how quickly our employees grasped the concepts. We ended up saving the company $3 million."

An initial small website testing engagement from Bose, the world-renowned maker of high-quality speakers and headphones, eventually led to hiring about 60 fulltime Aspiritech employees to serve the company on other projects.

"There are many ways to use Bose speakers, such as through Spotify, Wi-Fi, on a laptop, router, or Bluetooth—that means there are many, many variables to be tested," explains Cohen. "As a private company, Bose is committed to quality, and autistic people have the ability to focus and see tiny details that aren't apparent to the rest of us. So we're finding new ways to help them reach their quality goals while saving them money."

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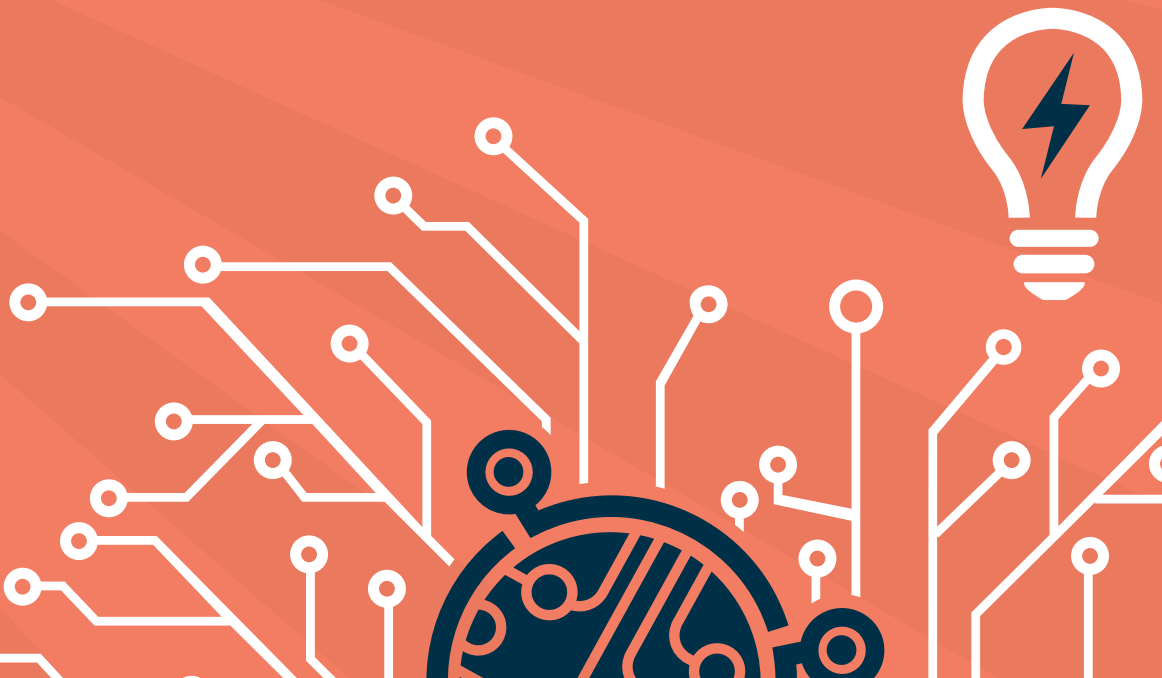
HIRE PEOPLE THAT ARE GREAT AT WHAT THEY DO, THEN GET OUT OF THEIR WAY.



KEEPING IT LOCAL

Once customers realize the value they're getting, they like not having to send work offshore and deal with time zone delays and cultural issues, Cohen says.

When Aspiritech tests scripts, "the client is looking at bugs at the same time we are," Cohen explains. "They can choose to fix them or not right on the spot." If the QA takes place overseas, however, scripts are sent back and forth across time zones with a delay in responsiveness.

By collaborating in real-time, "We compress QA. If we make an IT director or developer look good or save them time and money, they'll come back. That's a level of security and stability that most QA firms don't provide," Cohen says.

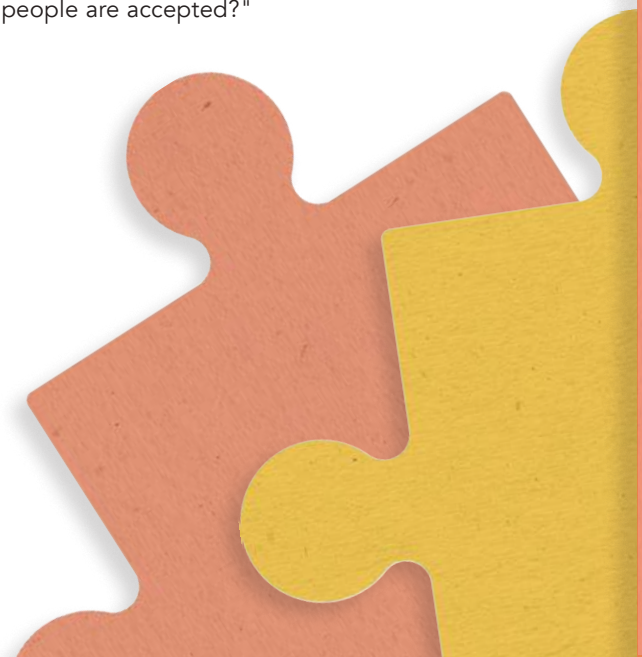
Adds Weitzberg: "Several of our clients have closed down their overseas facilities and brought that work to us. That's because we work faster and better and we are more affordable."

Aspiritech charges $50 an hour, while on-shore companies typically charge $90 to $100, explains Cohen. "A lot of our clients like that we're here in Chicago, that we have a real office, speak English, and have no [intellectual property] issues."

THE WAVE OF THE FUTURE

At present, there are "too many talented individuals sitting in their parents' basements playing video games with no hope for a better future," says Aspiritech's Weitzberg. "We have talent here that can be put to work and improve the business community."

All in all, a diverse workplace "is a better mousetrap," agrees Cohen. "The wave of the future is toward inclusion, whatever your shortfalls are. Who doesn't want a world where people are accepted?"



BUILDING AN INCLUSIVE WORKPLACE CULTURE

Based on the premise that hiring and advancing workers with disabilities is good for business and for America, an organization funded by the U.S. Department of Labor's Office of Disability Employment Policy (ODEP) helps employers learn how to weave disability into their diversity and inclusion efforts. If you're interested in expanding your talent pool to include individuals with disabilities, check out the Employer Assistance and Resource Network on Disability Inclusion (EARN).

EARN is a free resource that's helping progressive employers create businesses inclusive of the disabled, including veterans, in order to benefit from a wider pool of talent, skills, and creative business solutions. Employers embracing inclusivity are also recognizing disability diversity as an important way to tap into a growing market, EARN says, because people with disabilities represent the third largest market segment in the U.S.

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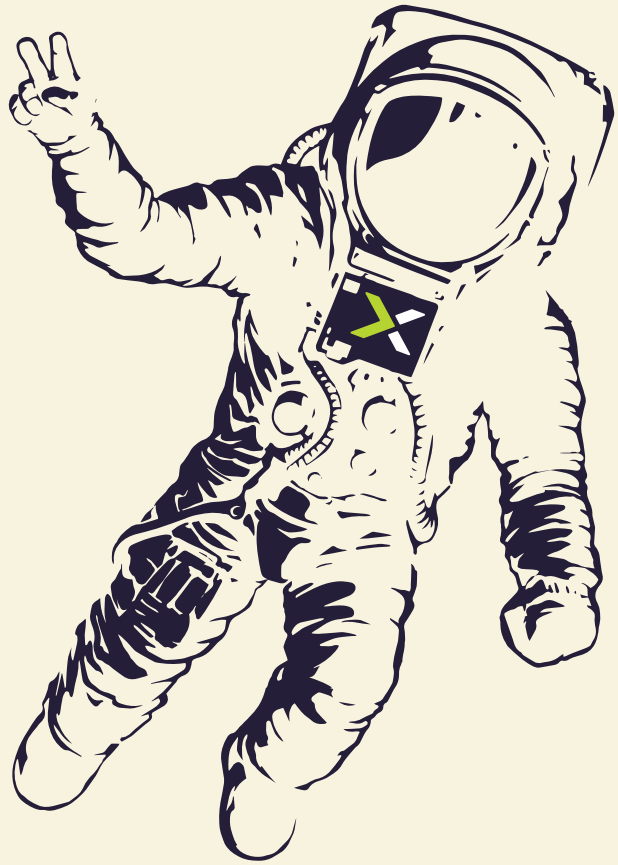

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Nutanix Breaks Final Barrier to Delivering All Applications to All Virtual Desktop Users

March 4, 2014
Nutanix Patent Ups the Ante in Software-Defined Storage Wars

May 1, 2014
Nutanix Unveils Industry's Most Comprehensive VDI Solution

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Nutanix IPO: Announces Pricing of Initial Public Offering of Nutanix Stock

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Nutanix Unveils Powerful One-Click Networks to Broaden Enterprise Cloud Platform

May 16, 2017
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Nutanix Reboots The Hybrid Cloud With Single OS for the Multi-cloud Era

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March 12, 2018
Nutanix Announces Definitive Agreement to Acquire Netsil

April 12, 2018
Nutanix Sees 74 Percent AHV Hypervisor Adoption By U.S. Federal Government Customers in 2017

February 8, 2018
Nutanix Named a Leader in 2018 Inaugural Gartner Magic Quadrant for Hyperconverged Infrastructure

August 2, 2018
Nutanix Announces Intent to Acquire Frame

August 29, 2018
Nutanix Enterprise Cloud OS Hyperconvergence-Based Solution Certified for SAP HANA®

December 12, 2018
Nutanix Announces Industry Recognition and Record Number of Award Wins in the Last Year

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