Deloitte Review

Can CEOs be un-disruptable?

Eight powerful truths about diversity and inclusion

Redefining the CMO

How to better understand your customers

Issue 22 | January 2018

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Industry 4.0: Are you ready?

Our exclusive global survey results | Inside Formula One's McLaren Racing | Cybersecurity | Human-centered design | Workplace responsibility

Deloitte. Insights

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LEADER

Sprinting toward the future

PUNIT RENJEN
Deloitte Global CEO

IMAGINE IT: SELF-DRIVING cars preventing thousands of accidents a year. Wristwatches monitoring vital signs to warn of impending heart attacks. Factories running at optimal capacity, with every process monitored and adjusted in real time. With the emergence of big data, cloud computing, the Internet of Things, 3D printing, and more, this is the world being ushered in by the fourth industrial revolution (Industry 4.0)—and it's manifesting at breakneck speed.

I thought the advances that helped accelerate my career during the last industrial revolution were astounding (think email, the internet, and mobile devices). Yet the complexity, speed, and scope of Industry 4.0 are unprecedented. Technology is being introduced not merely to enhance production and efficiency or solve operational issues, but to create entirely new markets. Individuals and small businesses are now primary innovators of advancements that disrupt markets—and they are merging the physical and digital worlds from community-based creative labs, coffee shops, and college classrooms. Today's disrupted are yesterday's disruptors. And as Industry 4.0 gains traction and speed, how the world works and lives is being redefined, reengineered, and reinvented. The line between the digital and physical is blurring.

In this context, disruption is certain. But so is opportunity. This is the nature of change, and although no one yet knows what the long-term implications of the fourth industrial revolution will be, the short-term reality

is simple: Businesses must prepare. And they should be prepared to act—quickly! That can start with being open to new ideas despite the potential discomfort of ambiguity, being proactive in seeking informed insights, being ready for the unexpected, and developing and employing multidimensional thinking. Organizations are competing in the equivalent of a marathon run at sprint speed on treacherous terrain. Uncertain? Urgent? Absolutely.

With that in mind, we have revamped the way we curate and publish insights generated by our more than 264,000 people. As part of this effort, our award-winning Deloitte University Press has become Deloitte Insights, delivering timely, globally relevant, experience-based insights to help organizations like yours navigate their toughest challenges—including Industry 4.0.

Deloitte Review will continue to be published biannually by Deloitte Insights. In this issue, you will get a taste for the depth and breadth of our thinking by reading about how ready—or not—CXOs are for Industry 4.0 by previewing findings of a global survey we're unveiling at the World Economic Forum Annual Meeting this month. Among other articles, you'll go inside Formula One team McLaren to see how advanced manufacturing techniques are deployed, learn why the chief marketing officer role may be due for redefinition, and find out how chief executives cope with disruption.

I hope you enjoy reading this magazine as much as our Deloitte leaders enjoyed writing it. And when you're done? Buckle up. The future is here and it's going to be an exciting ride.

on the

Facing the opioid epidemic

The statistics on annual opioid deaths in the United States are sobering: In 2014, drug overdoses killed about one-and-a-half times more people than car accidents. This article and podcast discuss how government agencies, communities, and health care organizations can together tackle this wicked problem.

deloitte.com/insights/opioids

Time: Your most irrecoverable resource

Working more than 80 hours a week, constantly connected by mobile devices, with no work-life balance? That's not sustainable—or enjoyable. Our podcast outlines five ways to take back your time.

deloitte.com/insights/time

Robots uncaged

We've long seen robots handle repetitive tasks and heavy machinery. But new technologies are moving robots out of the warehouse and into the office. Could a robot be your next cube mate?

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Becoming irresistible: A new model for employee engagement

What makes an organization "irresistible"? We explore how changing employee needs are compelling business leaders to better engage employees, and offer strategies for making that happen.

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e web

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Understanding the digital thread

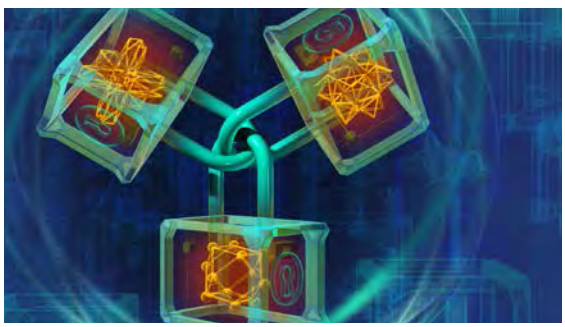
Industry 4.0 is ushering in a new class of pioneers and innovators. Watch our video to learn why leaders who understand the digital thread and its potential could be poised to thrive in this new era of production.

deloitte.com/insights/digital-thread

Tech Trends 2018: The symphonic enterprise

It's all CIOs can do to keep up with each new disruptive technology—blockchain, cognitive, digital reality—and incorporate them into specific organizational domains. But there's a better way to understand and use today's profound changes: to see these technological forces as complementary, working in harmony.

deloitte.com/insights/tech-trends



3D opportunity for adversaries

The same benefits that make additive manufacturing so valuable may also be exploited by those seeking to do harm. How can those tasked with national security anticipate these trends and prepare for action?

deloitte.com/insights/3d-printing-adversaries

INDUSTRY 4.0: ARE YOU READY?

by Punit Renjen

ILLUSTRATION BY JOHN W. TOMAC

THE INDUSTRIALIZATION OF the world began in the late 18th century with the advent of steam power and the invention of the power loom, radically changing how goods were manufactured. A century later, electricity and assembly lines made mass production possible. In the 1970s, the third industrial revolution began when advances in computing-powered automation enabled us to program machines and networks.

Today, a fourth industrial revolution is transforming economies, jobs, and even society itself. Under the broad title Industry 4.0, many physical and digital technologies are combining through analytics, artificial intelligence, cognitive technologies, and the Internet of Things (IoT) to create digital enterprises that are both interconnected and capable of more informed decision-making. Digital enterprises can communicate, analyze, and use data to drive intelligent action in the physical world. In short, this revolution is embedding smart, connected technology not only within organizations, but also our daily lives.

So how prepared are organizations and leaders to embrace this revolution?

Not very. We surveyed 1,500 C-level executives across 19 countries to explore a core question: *How ready are the leaders of businesses and government agencies to harness the full potential*

Only 14 percent of CXOs are highly confident their organizations are ready to fully harness Industry 4.0's changes.

of Industry 4.0 to benefit their clients, their people, their organization, their communities, and society more broadly? Here's an exclusive preview of our key findings:

- Just 14 percent of respondents are highly confident their organizations are ready to fully harness the changes associated with Industry 4.0
- Only a quarter of CXOs surveyed are highly confident they have the right workforce composition and skill sets needed for the future, despite 84 percent saying they are doing everything they can to create a workforce for Industry 4.0
- CXOs overwhelmingly (87 percent) believe Industry 4.0 will lead to more equality and stability, and three-quarters say business will have much more influence than governments and other entities in shaping this future
- Yet less than a quarter of those surveyed believe their own organizations hold much influence over critical factors such as education, sustainability, and social mobility

Our research found that while CXOs see new business or delivery models as the biggest threat to their organizations, they are largely using Industry 4.0 technologies as a tool to make existing operations more efficient and cost-effective. That leaves untapped tremendous opportunities to pursue innovative business models that may not only drive value for direct and indirect stakeholders, but better protect them from disruption.

Four major areas of impact

How can executives navigate this change? Given its integration of digital and physical technologies across all areas of business, production, mobility, and communications, the fourth industrial revolution represents a broad, pervasive shift that should be dealt with comprehensively if organizations are to thrive. When dealing with something so vast, it's useful to examine how it may impact particular elements, and we concentrated on four:

SOCIETY

Executives seem to view technology fearlessly, as the great equalizer that will provide more access to education, jobs, or financing across different geographies and social groups. And a large majority of executives see businesses—both public (74 percent) and private (67 percent)—as having the most influence on how Industry 4.0 will shape society, with government a distant second. Yet many executives don't believe their *own* organizations hold much sway over issues such as education and learning for employees, environmental sustainability, or social and geographic mobility. This gap is echoed by the expectations of Millennials, who believe multinational businesses are not fully realizing their potential to alleviate society's biggest challenges.[1] If business is truly to play a leading role in the far-ranging societal implications of Industry 4.0, organizations should embrace transformative changes—before it may be too late.

STRATEGY

Even as leaders recognize the changes Industry 4.0 portends, many continue to focus on traditional near-term business operations, rather than longer-term opportunities to create value for their direct and indirect stakeholders. We found that 57 percent of CXO respondents put developing business products as their top issue, with increasing productivity at 56 percent. While these issues dovetail nicely with some elements of Industry 4.0, they

remain traditional goals that may not capture the revolution's promise when it comes to everything from delivering continuous learning to tapping new sources of talent, reaching underserved markets, offering predictive tools to help improve processes and reduce risk, connecting supply chains, enabling more agile systems, and much more.

TALENT

Many executives don't seem to feel the urgency of tackling the challenge of the future of the workforce—even though only a quarter are highly confident they have the right workforce composition and the skill sets needed for the future. This may be explained by our findings that a vast majority of executives believe they are doing all they can, that they can rely on existing education systems, and that their current employees can be retrained. Put simply, they are concerned but also don't believe radical changes are necessary to ultimately get them where they need to go. While historically technology creates more jobs than it destroys, these newly created jobs should be encouraged by effective workforce development.

TECHNOLOGY

The fourth industrial revolution holds the promise of integrated digital and physical technologies that improve organizational operations, productivity, growth, and innovation. But rather than using digital technologies to do the same things they've always done before, only faster and better, we found true Industry 4.0 organizations use them to create new business models. Organizations that expand their use of Industry 4.0 technologies to include suppliers, customers, workers, partners, and others in their ecosystem can find more transformative benefits. The problem? Only 20 percent of CXOs we surveyed consider their organizations highly prepared to handle new business or delivery models, and less than 15 percent believe they are highly prepared for smart and autonomous technologies.

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All revolutions are disruptive, and Industry 4.0 is no exception. It poses risks, but offers tremendous opportunity: for new products and services, better ways to serve customers, new types of jobs, and wholly new business models. As with previous industrial revolutions, the impact of these changes has the potential to ripple across industries, businesses, and communities, affecting not just how we work, but how we live and relate to each other.

Our survey shows CXOs get it—they understand Industry 4.0 will bring dramatic changes, and they need to prepare. Yet they are less certain as to how to take action, and don't have much time: In this age of unprecedented global social and economic connectivity, the fourth industrial revolution is happening quickly, in ways large and small. If leaders choose to think more broadly and act decisively, their organizations may play a leading role in ensuring Industry 4.0 acts as a positive force.

This is an exclusive preview of a global survey Deloitte will unveil at the World Economic Forum Annual Meeting 2018, held from January 23 to 26 in Davos-Klosters, Switzerland. To read our full report upon release, visit deloitte.com/insights/industry-4-0-survey.

PUNIT RENJEN is the CEO of Deloitte Global. Previously, he served as chairman of the board, Deloitte LLP (US), and, prior to that, as chairman and CEO of Deloitte Consulting LLP. He is based in Portland, OR.

McLaren driver Stoffel Vandoorne during final practice for the Formula One Grand Prix of Brazil on November 11, 2017.

RACING the FUTURE OF PRODUCTION

A CONVERSATION WITH SIMON ROBERTS, OPERATIONS DIRECTOR OF McLAREN'S FORMULA ONE TEAM

by Joe Mariani

CARBON FIBER, TITANIUM, and rubber hurtle around a racetrack at nearly 200 miles per hour. Engines roar and fans cheer as drivers throw their cars into every corner. Formula One racing is not only among the most exciting sports on the planet, but also perhaps the most technologically advanced. Every car is a symphony of advanced materials and novel design. Yet the real excitement starts well before the crowds and champagne of race day, and far away from the track.

It all begins with the hundreds of designers, manufacturers, and support staff that make up the race teams, which in reality are mid-sized manufacturing companies. But these race teams are not merely typical manufacturers. In an effort to shave every ounce of weight from the car, every tenth of a second from lap times, Formula One teams use nearly every advanced manufacturing technique available, from additive manufacturing to the digital thread. These technologies, in turn, change how the race teams must operate as a company. In short, Formula One race teams are already experiencing today the technological and management shifts that mainline manufacturers will likely see in 5–10 years' time.

To get a glimpse into that potential future and the fast-paced world of Formula One racing, we sat down with Simon Roberts, the chief operating officer of McLaren Racing. The interview was conducted by Joe Mariani, a research manager with Deloitte's Center for Integrated Research.

Pushing the boundaries of the possible

JOE MARIANI: At its core, McLaren Racing seems to be a car manufacturer. I am sure we all have a picture of how cars come together, likely black-and-white images of a Henry Ford assembly line. Can you give us a quick overview of the design and manufacturing cycle that you go through every year to pull these cars together?

SIMON ROBERTS: Compared to most automotive industries, we do to ourselves every year what most big automotive companies will do every three to five years. We start designing our cars in March with the longest lead activities, which is the gear box. As the year goes on, we end up with draft regulations around August, and that is when we start laying out the chassis for the car based on whatever our research has been doing and where we think the sport is going so that we can be competitive for the next year.

MARIANI: But March is also the beginning of the race season. So are you designing the next car even before the current car is finished racing?

ROBERTS: Yes, we have a two-week mandatory shutdown in August, and really from that point on, we start having to split our activities in two between

A QUICK GUIDE TO FORMULA ONE

>> HISTORY Formula One is the highest class of single-seat auto racing sanctioned by the Fédération Internationale de l'Automobile (FIA). While Grand Prix racing began in 1906, the inaugural FIA Formula One World Championship was held in 1950.

>> RULES The "formula" in Formula One refers to the set of technical and sporting regulations all cars must meet, determining vehicle size, engine performance, and safety standards. Teams have leeway to innovate within these rules, and the effort to gain milliseconds has resulted in the creation of technologies that are now standard on passenger vehicles, including disc and anti-lock brakes, rear spoilers, semi-automatic gearboxes, advanced engine monitoring, all-wheel drive, and electronic stability control.

>> RACES The most recent season comprised 20 Grands Prix, starting in March 2017 in Australia and ending in Abu Dhabi in November.

>> PERFORMANCE Current Formula One cars feature:

- 1.6 liter V6 turbocharged engines, limited to 15,000 RPMs. While teams do not disclose horsepower data, the engines are believed to produce as much as 1,000 brake horsepower
- A minimum weight of 722 kilograms (1,592 pounds)
- Top speeds in excess of 330 kilometers per hour (205 miles per hour)
- Ability to go from 0 to 60 mph (0-100 kph) in less than 2 seconds—and stop again almost as quickly

The power and downforce of the cars mean drivers can experience lateral loads of as much as 6G (six times the force of gravity) while cornering—similar to fighter pilots.

Simon Roberts
McLaren Racing chief operating officer

keeping the current car running and competitive and starting to think about next year. So right now, in early October, we are probably 50/50 in the design office and engineering. Obviously we race until the end of November, and we start the ordering long lead time parts to fill inventory from November onwards.

From those two points on, then, it is basically a rush to get everything designed and released, hopefully, in time for Christmas. That is normally about 16,000 components that have to be designed and then manufactured for the new car. Then, at the end of January, we build the first car.

So it is a fairly short lead time. We will pre-book capacity both internally and externally, and that will all come together on an hour-by-hour basis just before we launch the car. It is quite normal for us to literally only have a finished car in the few hours before the launch event.

MARIANI: That is fascinating, especially the comparison to a main line car company that may slowly design and build many thousands of cars, where you must very rapidly build a small number of cars.

ROBERTS: Yes, we only ever build four chassis, and there are only ever two fully built cars that will race. The other thing is that we never really stop. Once we have built the car and start testing and racing it, we change the car about once every 10 minutes. Every 10 minutes we get a new CAD drawing out. That is a kind of relentless upgrade of everything. Normal carryover from year to year of about 3–10 percent is typical. But by the time we get to the end of the year, it is about 0 percent. The entire car is new. It is just a rapidly changing environment really, meaning we are only ever committing to small batches of things. A batch of four to six is a fairly typical manufacturing run, because by the time we have made six front wings, we have changed the design and are doing something else.

MARIANI: When you are making these parts and fitting them together on such astronomically tight timelines, how do you ensure that everything is up to quality standards?

ROBERTS: Every part we make or buy is loaded to a work order, so we have full traceability. All the material and all of the inspections are tracked against the individual part number in the work order. We can trace right back to the mill where we get the metal from, and we can see who loaded the blank onto the machine, when it was loaded, when the part came off, when it went to inspection, and heat treatments, certificates, or checks that were done on it right down to the finished product.

> “Once we have built the car and start testing it and racing it, we change the car about once every 10 minutes.”

MARIANI: I suppose that lifing process—where you can determine the useful life span for each individual part—does not end when they are entered into the system, but continues with the data actually gathered as the race car is driving?

ROBERTS: Yes, we have got these tiny little RFID chips. On carbon parts, we laminate them in under the skin. They are so small you can’t even see them. On metallic parts, where we can, we attach them with a glue/resin system. But they are so small we can fit them inside bolt heads. So once we have issued the parts, we scan them so that it takes out

all the human error of typing the life codes of part numbers.

The odd thing is that we do not sell anything in general terms. Everything we make is for our own race cars. So we don't ever have a sales transaction. In fact, our two race cars are actually stock locations on the system. So if you sat and watched our stock system on a race weekend, you can actually see parts booking onto the car or off of the car as mechanics make changes at the track. That also auto-records mileage, the number of starts, the time that part has been on a car to make sure that no part exceeds its life span or design limits. It is a bit like aircraft from that point of view. We are lifing at the level an aircraft does.

MARIANI: Tracking the individual location and life span of each of 16,000 parts seems like an incredible amount of detailed data. How do you bring together all of those parts and all of that data into one small car and make it work at peak performance?

> "We probably run 50,000 simulations just to get our heads in the game and figure out what we need to do."

ROBERTS: Where to start? Even before we get to the race track, we are running simulations. We are running simulations now for Japan, for example. We have a pretty sophisticated Monte Carlo simulation which has all the data we can find for every driver and for every team, what has happened at that event in the past, everything you can imagine. We probably run 50,000 simulations just to get our heads in the game and figure out what we need to do. That is just for a pure race strategy point of view.

In terms of the car itself, we are also running very sophisticated [digital twin] models of the race car. We are testing all of the parameters we can think of for the car—all the latest upgrades, all the suspension variables—they're all dialed into the computer. We then use that data in a driver-in-the-loop simulator, which is the ultimate test for us. That is one of the reasons why we think when we turn up at a track on a Friday, we always look slightly better in the first practice session than everyone around us.

Adapting advanced technologies to real-world needs

MARIANI: In manufacturing, it seems like we often have the idea that new technology will simply replace human workers. But even amidst so much advanced technology, many of your processes still have strong manual components. Have you noticed a shift in what you ask of your workers?

ROBERTS: So what we notice is—because we are rushing—our work instructions to our people are very high-level compared to what you would see in an automotive or aircraft industry production facility. What we only recently realized is that it's OK, and that we actually rely a huge amount on the profound knowledge in all of our employees. We used to take it for granted, and the big thing that has changed is that we no longer take it for granted. So if they find something difficult or if we have got something wrong or if things have not worked out as expected, we really need to take notice of that.

MARIANI: So much of the success of the race team seems to be about balancing high technology with the very human needs of workers. Our recent

research[1] is pointing towards the fact that the greatest productivity comes when humans and machines are working together to do what neither could do alone. How do you strike that balance or find the right mix of human-machine teaming?

ROBERTS: It varies. On the composite side, which is all the carbon fiber, chassis, body work, wings, etc., it is a fairly manual process. Our carbon molds are still handmade. We don't have any automated tape laying or laying of cloth. But we do use technology where we can. We use lasers on all the large components—chassis, front wings, rear wings, gear cases—to validate layout and dimensions. We can't afford to finish a chassis after eight weeks of laminating and discover that the third ply is the wrong material or laid in the wrong orientation. So we try and mistake-proof it using lasers and laser files.

The operation and monitoring of the car is another area where technology plays a significant role. In practice, we probably run up to 500 channels of data on the car during a practice session. All of that feeds back in real time to the pit wall, and then back to the factory in Woking, England where engineers try to piece together a picture of what the car is actually doing vs. what we want it to be doing at that particular track at that time.

However, once the race or qualifying starts, we are limited by regulation to only 250 sensors on the car. So we must use quite a lot of clever methods both on- and off-car to effectively combine channels and find more interesting data in virtual channels. As a result, the whole telemetry system on the car is set up so that it looks after itself. It will automatically flag channels where data is going out of limits or rising or falling faster or slower than expected. This demands a close cooperation between humans and the automation.

One example is gear shifts. When a driver calls for a gear shift, it actually puts two gears in mesh at once, because it is so fast that, as the torque loads up on the new gear, you can, with hydraulic pressure, pull the old gear out without smashing the teeth off it. But that gets a bit glitchy on wet pavement when you get a lot of unexpected wheel spin, which the algorithm doesn't like very much. If something like that happens and a driver calls for a shift, it won't just bang two gears in without using the clutch, it will dip the clutch in, take one out and put one in. That is what we call a "safe shift." It takes a few milliseconds longer and the drivers don't like it. So that kind of thing is happening all the time in the background.

McLaren's Technology Centre in Woking, England

MARIANI: That concept of telemetry looking after itself and how it interfaces with the driver and the

crew on the pit wall seems like a form of AI-human interaction that we have seen other industries, including aerospace and defense, struggle with. So that seems to be a very interesting solution.

ROBERTS: You know we are looking at AI and how we can use it, particularly, in the optimization of simulations and stuff. It is the same with big data.

"We are trying make sure that everyone is very free with their data internally. Because you never know how what you're doing is going to affect someone else."

We have inadvertently been doing big data and a low-level version of AI and Internet of Things for a while really. But because we are not in that field, we put all of our time and energy into developing the racecar, we don't look at these things and badge them.

Maintaining speed and flexibility

MARIANI: With all of the sensors on the car generating so much data, and some analysis being done on site, and some back in the United Kingdom, how do you divide up the workload between track-side and the facility back in the United Kingdom?

ROBERTS: In terms of division of tasks, in simple terms, what happens is, the stuff where you need cool, calm calculation and analysis, and detailed thinking is best done back here at the factory. An example of that in the race is trying to work out tire degradation for all our competitors or fuel usage by all competitors, so that we can strategically decide if we want to push hard or back off at a certain stage of the race. That is really hard to do if you are in the back of the garage with all the heat and emotion of the race, but relatively easy to do if you are sitting back at your desk in mission control here in a nice air-conditioned unit with headphones on. You only hear the things you need to hear, and you have loads of computers and power around you if you need it.

If things go wrong and someone knocks a bit off the side of your car, the guys at the track are only going to check if it is safe. They will look at the loads on the wishbone of the wing and decide if it is safe to run. They don't have time to look at all of the aero data to see how many points of downforce we may or may not have lost at a particular end of the car. But the guys here will do all that and then advise them.

MARIANI: Talking about all of these complex processes both on the race day and in the manufacture of the car, because all of these components are so interdependent, does that change how the work groups must function together? In other industries, we have seen the rise of cross-functional teams or rotations between work groups. Your thoughts along those lines?

ROBERTS: We are trying make sure that everyone is very free with their data internally. Because you never know how what you're doing is going to affect someone else. Luckily, because we go racing every one to two weeks in the season, the race events force us—and force people—to get together communally. Even if they are not in the same office, they are all

on the same intercom systems. Everyone has a role and everyone understands what they are trying to do and what the overall objective is. That kind of cuts through what, in many other companies, could grow into an issue.

Managing change in an uncertain future

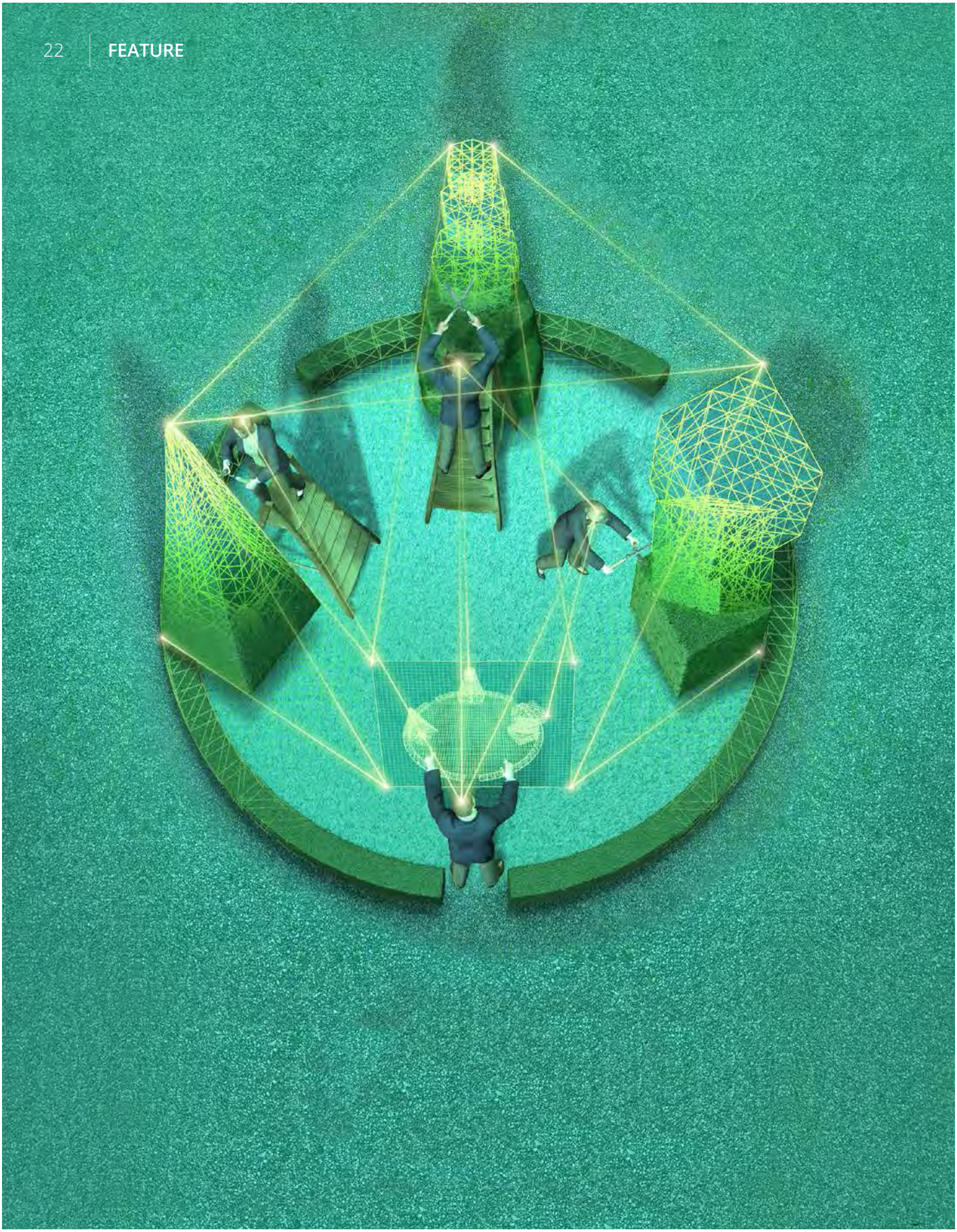
MARIANI: We have talked a little bit about how the technologies are developing, and your last comment talks a bit about how the organization is developing, so what is next for McLaren? What is on the horizon? What is the next big technology or organizational shift that will take you even faster?

ROBERTS: If only we knew ...

MARIANI: That's right, you will know it when you find it!

ROBERTS: I think the future is really about giving people the balance—the balance of technology, balance in their lives. I have noticed that the engineering organization here is quite resistant to organizational change, more so than other groups here. I don't actually know, but my hunch is that, because their world changes—either the regulations every year or the designs they are working on, the parts they are making—the one thing they cling onto for a bit of stability is where they sit in the organization. We ask so much of them, and they give so much, we are OK with giving them a bit of stability. It doesn't stop us from doing what we need to do as a team.

JOE MARIANI is a research manager with Deloitte Services LP and series editor for Deloitte's research campaign on the Internet of Things (IoT). He is responsible for examining the impact of IoT on a diverse set of issues from business strategy to technical trends.



FEWER SLEEPLESS NIGHTS

HOW LEADERSHIP CAN BUILD A CULTURE OF RESPONSIBILITY IN A DIGITAL AGE

by Brenna Sniderman, Kelly Monahan, Tiffany McDowell, and Gwyn Blanton

ILLUSTRATION BY J. F. PODEVIN

AS LEADERS CLIMB the career ladder, increase their span of control, and find themselves navigating higher levels of organizational complexity, the art of letting go can become paramount to their success. Effective leadership often means handing your projects over to other members of the team and empowering them to guide those projects to successful completion. It can mean feeling confident as a leader that your team will produce results at the same high standards to which you hold your own work. It likely means trusting employees to feel responsible for the outcomes of their work, and to put in the necessary effort and oversight to ensure a project's success.

But what if your employees *don't* feel that sense of personal responsibility?

And worse: What if something goes wrong as a result?

Welcome to a common problem that often leads to sleepless nights for far too many leaders. Projects fall apart and mistakes happen in the workplace for many reasons, and instilling in employees a sense of personal responsibility over project outcomes can be difficult even in the best of times. For as

old as this leadership challenge is, however, it may pose a bigger difficulty now than ever before, due in part to the ubiquitous digital connectivity inherent in the fourth industrial revolution, also known as Industry 4.0.

To be sure, the connectivity of the Industry 4.0 era seems to represent an overall positive shift for companies. But when every part of the business—financial, production facilities, and even external partners and customers—is connected, digitized, and increasingly transparent, the amount of information available can be staggering.[1] Further, the stakes are often higher: Broad interconnectivity can mean that a poor outcome in one node can amplify across the whole ecosystem, extending the ripple effects further than ever before.[2]

Yet while the digital environment can amplify mistakes, often overlooked in the rise of the digital workplace could be how it *also* typically shifts the ways in which workers experience their day-to-day jobs. This shift is likely no less important. For example, many in-person relationships have suffered with the onset of digital, connected technologies, weakening connections and commitments to others in the workplace.[3] Shifting jobs and flexible teams can make it harder to define whom we are responsible to—and what we are responsible *for*—in many organizational contexts.[4] These changes can make it difficult to distinguish the roles and rules of the new, digitally driven workplace, so many workers could simply lack the necessary information to make the right choice.

In short, digital technologies can contribute to a lack of clarity around *roles*, *rules*, and *relationships*—making *responsibility*, or the choice to take ownership all the way to the end outcome, more difficult in today's workplace. As we will explain, these three pillars should be in place for one to take responsibility. A lack of clarity in just one of these areas can weaken one's sense of responsibility for a work-related outcome. Thus, as a leader, it's usually important to instill strong clarity around rules, relationships, and roles before handing off a high-stakes project to your team. Because let's face it, as the leader, you would ultimately be held responsible for your team's mistakes.

Within this article, we examine these three sides of the responsibility triangle—roles, rules, and relationships—that contribute toward building a culture of responsibility within an organization. We explore three major ways the digital environment can cause each of the sides of the triangle to collapse, while making the consequences of irresponsible actions more widespread. Finally, we offer three organizational-level strategies that could help managers design environments that strengthen the three pillars, infusing a sense of responsibility to employees in a digital age.

Building the bonds: The three Rs of assuming responsibility

We define *workplace responsibility* as making the intentional choice to assume ownership over the outcome of a work-related decision or process.[5] This is the choice we consciously make, *prior to our action*, to answer for the result. In contrast, the rational process that occurs *after the behavior* is the process of assigning accountability, or blame.[6] While these two concepts are similar, our paper focuses on the decision-making or choice that occurs *prior* to the behavior itself. As we will discuss throughout, the digital environment can make it increasingly easier for employees to diffuse their sense of responsibility prior to an action.

Several factors can help determine whether employees assume responsibility for the outcome of their work. Research suggests that people are more likely to take this type of ownership when they have a strong understanding of the rules, a network of connected relationships, and an understanding of their role within a larger system.[7] (See the sidebar "About the research" on page 26 for further details.) We refer to these crucial areas as the three Rs: a set of interconnected criteria that must be met for an acceptable level of responsibility to be assumed (figure 1).

Researchers have referred to these three factors as the *psychological glue* that attaches an individual to the end outcome. The three Rs are the markers, or checkpoints, that people often use to determine their level of engagement in, and willingness to take ownership of, a task.

The three pillars of responsibility, which help determine the level of motivation employees have toward owning an outcome, are defined as:

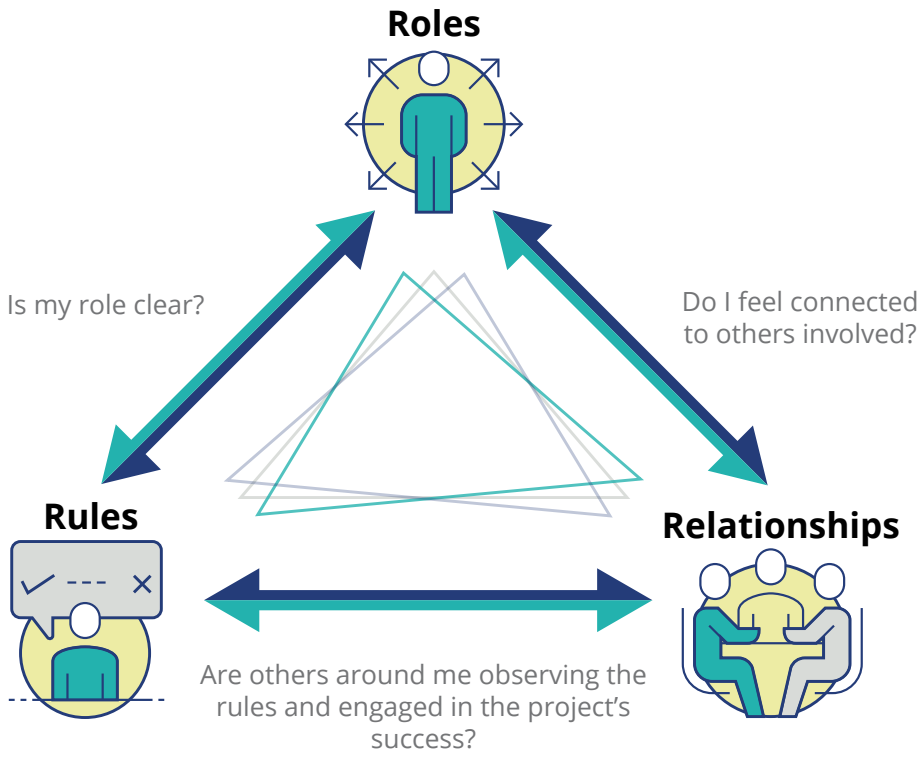
ROLES: IS MY ROLE CLEAR?

Role clarity is the extent to which individuals understand their areas of responsibility and the impact they can make to the organization. This pillar is often essential to enabling employees to see how their work impacts a larger purpose.[11] Employees who experience strong role clarity are more likely to feel a sense of identification with the organization and may willingly invest more energy toward positive outcomes.

RULES: ARE OTHERS AROUND ME OBSERVING THE RULES AND ENGAGED IN THE PROJECT'S SUCCESS?

Rules encompass the explicitly communicated processes, as well as the implicit social norms, that govern the *right thing* to do in a particular context. Rules set the boundaries for engagement and provide a mutual understanding of how to assess what is "right" within a specific context. Outmoded

FIGURE 1 | The three Rs of responsibility



Source: Adapted and modified from Barry R. Schlenker, "Personal responsibility: Applications of the triangle model, *Research in Organizational Behavior* 19 (1997): p. 241.

rules or a general apathy of others toward policies can create confusion on how work actually gets done within an organization.

RELATIONSHIPS: DO I FEEL CONNECTED TO OTHERS INVOLVED?

Relationships describe the strength of interpersonal trust, or connectedness, among the individuals involved, and the feeling that team members are invested in each other's growth and development. Stated simply, it's the belief that others have your back. Research has found that individuals are more willing to take responsibility when they believe others are supportive and invested in their overall success at work.[12]

These three pillars can govern how much effort and attention employees expend toward their work, and can help determine the extent to which they believe themselves responsible for the outcome. A lack of clarity or a sense of weakness in any of the three Rs can result in the individual detaching from the outcome, causing the triangle to collapse on itself and giving rise to some familiar excuses: *It isn't my job. I don't think the rules apply here. I don't feel supported.* By providing a sense of ownership through strong role and rule clarity, as well as connecting individuals to others within the organization through interdependent relationships, leaders can help provide the necessary infrastructure for responsibility.

Keeping the three pillars of responsibility strong can prove challenging even in the best of situations. Just think through how difficult it is to keep up with everything your team has to do within your organization, and how challenging it can be to ensure timely updates and communication of progress. A digital environment could further complicate this process, by placing workers further away from each other and environmental cues that help determine who has responsibility, and removing the social guardrails—those unspoken, invisible societal norms that encourage and even pressure preferred behavior—that prevent them from easily opting out.

ABOUT THE RESEARCH

Barry Schlenker, emeritus professor of psychology at the University of Florida, discovered that individuals with a strong sense of responsibility prior to an action were much more likely to commit to higher levels of performance, persist longer, and perceive greater ownership over the results.[8] Schlenker and associates conducted a variety of lab experiments to determine what factors went into an individual taking responsibility prior to action. Three factors arose as statistically significant predictors of responsibility—a strong sense of identity, a keen understanding of the rules, and a sense of obligation or duty to others. We have translated these academic empirical findings into the three Rs model (see figure 1), which allows business professionals to apply years of psychology research to workplace contexts.

Schlenker and associates' research findings were then tested against real-world environments. For example, Thomas Britt, professor of psychology at Clemson University, found that soldiers' psychological engagement during military missions on the battlefield were a direct function of how strongly their roles, rules, and relationships were defined.[9] Another study conducted in a classroom found that a student's actual performance could be predicted by how strong their responsibility beliefs (three Rs) were prior to the exams. Finally, within an organizational context, research found that over 50 percent of an employee's willingness to help was explained by their personal responsibility beliefs.[10] These research studies also suggest that the level of responsibility people presume prior to an action predicts how much effort and engagement they will likely put toward its success.

In the following section, we'll look at three ways digital technologies may change the workplace environment and potential subsequent effects on roles, rules, and relationships—and thus, by extension, on personal responsibility.

Breaking the bonds: Three impacts on responsibility in a digital environment

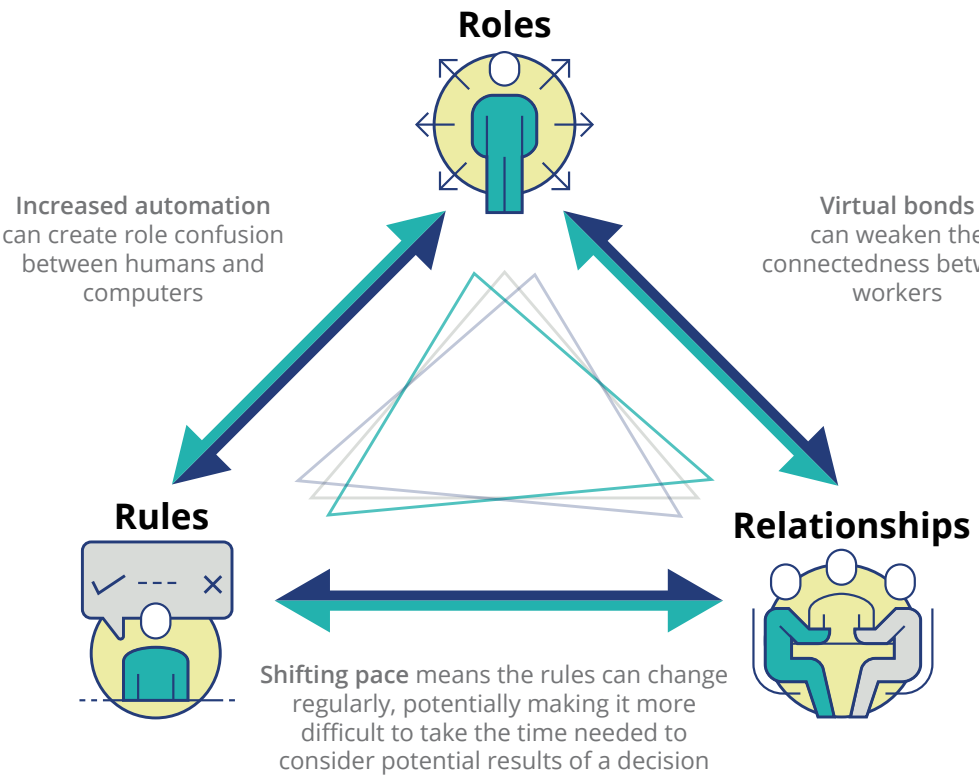
The rise of digital technologies makes work more convenient, sometimes with the unintended consequence of reducing workers' senses of responsibility in the workplace. Here, we examine three digital environmental trends that may impact the bonds of roles, rules, and relationships in ways that may reduce the level of responsibility a worker takes for their work. These are (figure 2):

- The rise of virtual bonds and remote work
- Increased automation
- The shifting pace of work

VIRTUAL BONDS: A GROWING ALTERNATIVE WORKFORCE CAN DISCONNECT WORKERS, WEAKENING THE BOND BETWEEN ROLES AND RELATIONSHIPS

Remote work has grown in popularity in recent years and technological advancements have made virtual teams not only feasible, but highly productive.[13] Workforce models are also changing, making

FIGURE 2 | Digital roadblocks to the three Rs of responsibility



Source: Adapted and modified from Barry R. Schlenker, "Personal responsibility: Applications of the triangle model," *Research in Organizational Behavior* 19 (1997): p. 241.

way for more alternative forms of work beyond the traditional full-time, on-campus employee model; remote work, contract work, and gig economy workers comprise a growing portion of the worker population.[14]

A side effect of this trend is that relationships among workers, and bonds with their leaders, can be more tenuous than in the past, with fewer opportunities to build ties based on experience and mutual trust.[15] One aspect of virtual teams is that they have been shown to reduce individuals' perception of the social presence of those who are not physically present, potentially weakening mutual feelings of obligation and increasing the sense that remote coworkers are less competent, reliable, and trustworthy.[16] A possible result of this cascade of effects is that workers may find it easier to blame mistakes on others, or feel less tied to the success of their leaders.[17]

INCREASED AUTOMATION: EXCESSIVE TRUST IN MACHINES AND DISTANCE FROM OUTCOMES CAN WEAKEN THE BOND BETWEEN ROLES AND RULES

As many repetitive, predictable tasks—from answering customer calls to manufacturing—grow increasingly automated, workers can become more decoupled from many of the tasks they used to do themselves. Even with constant monitoring, technology simply cannot provide the same social guardrails against mistakes that another human would. Reliance on automation may even lower barriers to error when, absent input from other humans, they consider the machine to be "in charge."[18] This tendency is known as *automation bias*: Humans accept the machine's answer as correct, ignoring conflicting information or their own instincts.[19]

We often see such philosophical discussions in the military, where the use of autonomous systems has been a source of significant debate focused on the potential to "destabilize traditional norms of military virtue," resulting in "moral deskilling" where the face-to-face element is removed from military missions.[20] Researchers have found, for example, that people are more inclined to treat each other poorly when high levels of automation are present, even noting, "Dehumanization is salient to the domain of technology."[21]

> The human owns the outcome, not the machine.

As we look forward to a continuing trend of humans and machines working together, each augmenting the other's skills in symbiotic collaboration, it may continue to be a challenge to remain alert to potential errors and take responsibility to prevent their occurrence where possible. Thus, as leaders find their own attention pulled toward other projects and seek to empower their teams to manage tasks in which automation is present, they should strengthen the link between role clarity and rules. After all, the human owns the outcome, not the machine.

SHIFTING PACE: ALWAYS ON, MAKING DECISIONS IN REAL TIME AND ON DEMAND, AMID SHIFTING RULES AND WEAKENING RELATIONSHIPS

Information can be a wonderful thing: an asset for making more informed decisions, uncovering previously unseen patterns, or revealing new opportunities. But in the digital age, it can also be considered a burden. For example, we often hear about the increased flow of information: 2.5 exabytes of data are produced every day, while 140 million emails are sent every minute.[22] For their part, connected assets create a flood of industrial data that far surpasses personal interactions.

Just as, or perhaps because, data never sleeps, employees are increasingly expected to be always-on

and agile, able to leverage new information to make decisions and act upon them as needed, on demand, and in real time. Given the amount of information now generated, rules that guide and drive decisions change constantly, creating a state of scarcity that forces employees to make reactive choices rather than strategic ones.[23] Further complicating matters, "alarm fatigue," or the desensitization to constant alerts and alarms, can make traditional barriers to error less effective; employees used to seeing alerts for every error, no matter how minute, may be more likely to ignore alerts for truly critical problems.[24]

Increased connectivity can also extend relationships beyond one's close, day-to-day colleagues to include customers, suppliers, and other teams within the organization. Employees may thus find themselves fighting battles on multiple fronts across a broad array of tenuous relationships, having to make quick choices that can affect many stakeholders. When rules are always shifting, relationships extend to a wide group of stakeholders, data never stops updating, and time is of the essence, mistakes are bound to happen.[25]

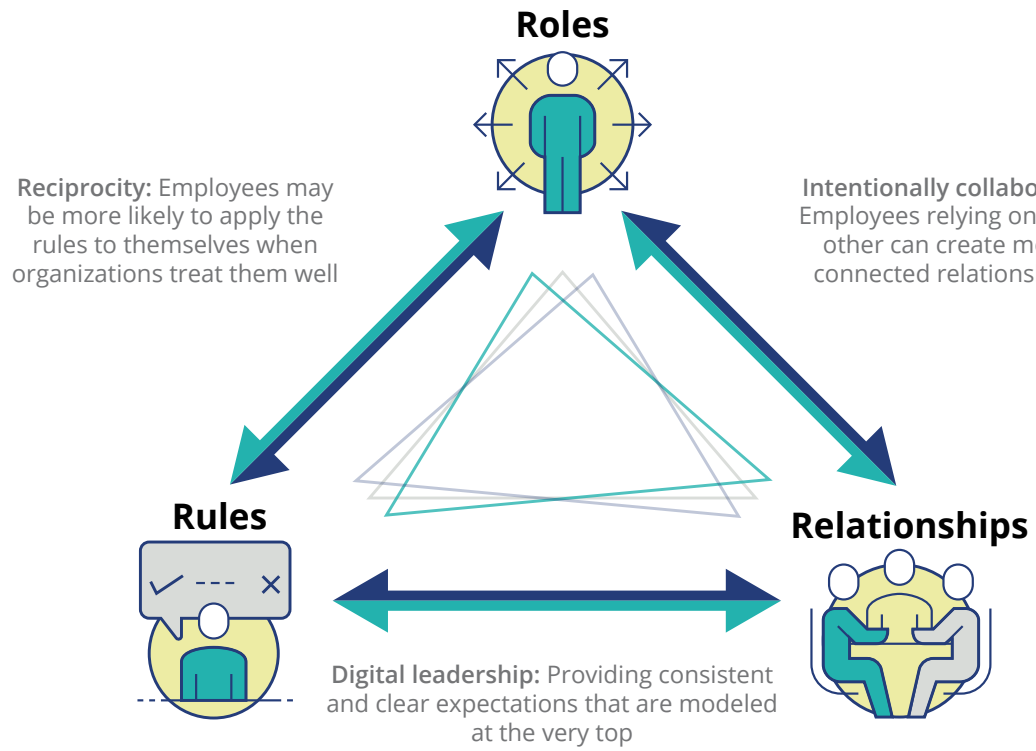
Further, despite their connectivity, the complex, sprawling digital environments that characterize many organizations today may make it more difficult for employees to see the bigger picture, or understand how their decision fits into a web of choices made by other stakeholders throughout the chain. When a variety of stakeholders is involved in a process, one initial misstep can get compounded with each subsequent decision. When mistakes do happen in this always-on, complex digital environment, the weakened link between rules and relationships can make it easier for employees to avoid personal responsibility—and for leaders to pinpoint where things went wrong to begin with.

Rethinking the environment: Three ways to strengthen the pillars of responsibility in a digital age

As a leader, delegating can be a challenge—especially without the necessary supports in place to help ensure that people will feel a sense of responsibility toward the outcome of their work. In this digital age, new challenges can weaken the three Rs of responsibility, possibly making this challenge all the greater. How leaders deal with this potential weakening can matter a great deal to the success of the organization, and, perhaps just as important, to that of their own teams and personal development. We see three ways that leaders can help strengthen the pillars of responsibility for their teams (figure 3):

When rules are always shifting, relationships extend to a wide group of stakeholders, data never stops updating, and time is of the essence, mistakes are bound to happen.

FIGURE 3 | The three Rs of responsibility strengthened



- Promoting intentional collaboration
- Driving reciprocity among coworkers
- Practicing digital leadership

Each is not only tied into the three Rs, but can also help address the specific ways in which digital technologies may be fraying those bonds.

1. INTENTIONALLY COLLABORATE: STRENGTHEN THE LINK BETWEEN RELATIONSHIPS AND ROLES

By taking an *intentionally collaborative* approach—one in which teams are brought together in ways that foster trust and a sense of ownership—leaders can create an environment in which their employees feel a sense of responsibility, not only to their work, but to their peers and their team.

Intentional collaboration can involve a mix of virtual and physical interactions related to a common cause. The term *collaboration* is key here, as individuals should feel as if they are working together, contributing to an overarching project or mission, and relying on each other. Collaboration should bring about a general sense of cohesion among all team members. While the workforce grows more untethered and roles more fluid, intentional collaboration can promote regular communications, improve engagement, and increase transparency in potentially uncertain and regularly changing environments. Further, for as much as digital technologies can reduce trust and responsibility, they can also provide opportunities for teams to communicate more, work together more closely, share information and resources more easily, and provide feedback in real time.

Creating an environment of intentional collaboration typically involves bringing together teams in all their forms as they exist across the organization: geographic dispersion, types of communities, nature of teams (for example, whether they are dynamic or static, active or inactive, regular or sporadic, remote

or in-person, formal or informal), and ecosystem structures (for example, organization-only, customers, suppliers, partners, and competitors) and networks to solve an organizational problem that transcends functional boundaries.[26]

Why it works

Behavioral research shows that people are more willing to go the extra mile and act honestly with people they like and trust.[27] In addition, the more we identify ourselves with others and a cause, the more motivated we usually are to assume responsibility for an outcome.

What can leaders try to implement?

1. Create peer accountability during goal setting. This can be accomplished by allowing employees to identify others who are necessary partners in achieving their own individual goals. As the environment grows increasingly interdependent, crafting goals that allow people to become accountable to each other could be a more effective way of clarifying roles and deepening relationships.
2. Reward and recognize collaborative efforts. As organizations transition to team structures, relying more heavily on participative and collaborative unit efforts, consider measuring group metrics rather than simply relying on individual performance metrics for rewards and recognition.
3. Whenever possible, try to leverage the wisdom of crowds in problem-solving. Bring people together to solve a problem bigger than their own work or function. Leverage the power of technology to bring people and ideas together in new, innovative ways that may not have been possible previously.

2. RECIPROCITY: MUTUAL BENEFITS CAN CREATE A STRONGER LINK BETWEEN RELATIONSHIPS AND RULES

Research suggests that employees who perceive their organization as valuing their contributions and caring about their well-being are much more likely to assume a sense of responsibility for others.[28] In fact, feeling responsible often precedes, and can even predict, prosocial behaviors in the workplace. This is likely due to our human tendency to want to repay those who treat us well, which psychologists refer to as *reciprocity*.[29] The sense of reciprocity can be a strong motivator to act in the best interest of others. However, the opposite also has been found to be true: Many employees who perceive that their leaders do not have their best interests at heart are likely to repay the organization in harmful ways, at worst by engaging in deviant behavior or by simply lacking the motivation to ensure a project's success. Therefore, the message of reciprocity is rather simple: If leaders want their employees to assume a sense of responsibility, they should treat them well. Employees who are treated well will be more likely to feel strongly that the rules apply to them, even when their manager doesn't have time to look over their shoulder.[30]

If leaders want their employees to assume a sense of responsibility, they should treat them well.

Why it works

Research suggests people often feel compelled to return favors. Studies also show we frequently underestimate the number of people who are more willing to give than take. Giving is often contagious and encourages positive behavior in the workplace.

What can leaders try to implement?

1. Check in often on your employees and their sense of commitment toward the organization. Annual surveys are usually no longer enough to ensure that a mutual relationship exists between employees and the organization, as it can be too late by the time you get the results. An easy and often missed opportunity is to check in during reoccurring one-on-ones and team meetings. While devoting time to project report-outs is typically important, it can also be important to set aside enough time to check in on the employee's overall engagement and needs.
2. Have the courage to make decisions that can benefit the whole organization—not just a few stakeholders within your own domain. This may include broadly shifting your focus to encompass larger customer and employee-oriented outcomes and needs. This may be easier said than done; however, by aligning functional goals to the organization's key strategic priorities and by finding opportunities to recognize and celebrate when these goals are realized by multidisciplinary teams, leaders can start to model the behaviors that lead to an environment of trust.
3. Empower employees to easily work across multidisciplinary teams, make decisions, develop the right skill sets, and adapt to changing priorities without having to go through multiple layers of hierarchy. To accomplish this, consider looking for opportunities to diversify team membership and bring individuals from different functions together, designing decision rights that allow team members to make their own, real-time decisions, and creating incentives that reward cross-functional teaming.

3. DIGITAL LEADERSHIP: SETTING AN EXAMPLE AMONG PEERS OFTEN STRENGTHENS THE LINK BETWEEN RULES AND ROLES

We know that humans often use the behavior of others to help determine the right course of action in particular contexts, which is illustrated by the link between rules and relationships. Most workers continually assess what others are doing to guide their own conduct.[32] Thus, one of the key influencers of most employees' behavior within their team starts with the behavior and tone of leaders.

In other words, it typically starts with *you*.

Leaders can model the right behaviors in an online context through the use of *digital leadership*.[33] Most digital leaders leverage technology platforms as a way to empower and build agility across their teams, not as a way to command and control resources. A digital leader can communicate consistently, authentically, and transparently with employees, leveraging technology as a way to provide real-time feedback. In addition, digital leaders can foster a culture of knowledge-sharing, continuously sharing relevant content and stories to engage the team. While the digital environment could certainly pose newfound leadership challenges, it could also pose an opportunity for leaders to leave a digital trace for others to follow.

Why it works

People are social creatures and often model the behavior of others—especially those in authority.[34] Numerous studies have shown how quickly people adopt the behavior of a leader.

What can leaders try to implement?

1. Hire digital leaders who work well with technology and can engage a diverse workforce toward a common goal. Most "digital leaders" embody many of the attributes we typically recognize in great leaders, with the addition of skills in digital platforms that can accelerate their ability to motivate and inspire their people.
2. Use surveys and leader assessments to measure and improve upon your digital leadership capabilities. For example, consider asking how well leaders encourage risk-taking and build trust among team members, or eliminate barriers to cross-cultural engagement—including geographies and time zone differences.

It can be challenging—even frightening—as a leader to let go and trust your team to feel the same drive that you do to take ownership for the outcomes of their work. It can likewise be difficult for employees to feel tied to responsibility for a project, and the ever-increasing influence of digital technologies on the workplace could only compound this problem. But you can rest assured—and even get a good night's sleep—that by strengthening the bonds between roles, rules, and relationships, leaders can help their teams navigate the digital, connected organization in a way that may also safeguard their own success.

BRENNA SNIDERMAN is a senior manager and subject matter specialist at Deloitte's Center for Integrated Research. She focuses on cross-industry themes and trends, specifically as they relate to additive and advanced manufacturing, Industry 4.0, the Internet of Things, and advanced technologies.

DR. KELLY MONAHAN is a manager and subject matter specialist at Deloitte's Center for Integrated Research. Her research focuses on the intersections of behavioral economics and talent issues within organizations.

TIFFANY MCDOWELL is a principal in Deloitte Human Capital and the national leader of the firm's Organization Strategies practice. Her focus is helping health care executives effectively lead their organizations through transformation.

GWYN BLANTON is a managing director who currently serves as one of six team leaders for Deloitte's US Ethics and Compliance group. She is responsible for planning and internal communications to address ethics and compliance matters for Deloitte US professionals.

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Exploring the world of connected enterprises

"You know, it is happening very, very quickly, and I think that's part of the reason that many people are afraid of it." In this podcast, Deloitte's Brenna Sniderman talks about Industry 4.0 and how companies can now analyze data, and learn from and adjust to their environment to inform future activity.

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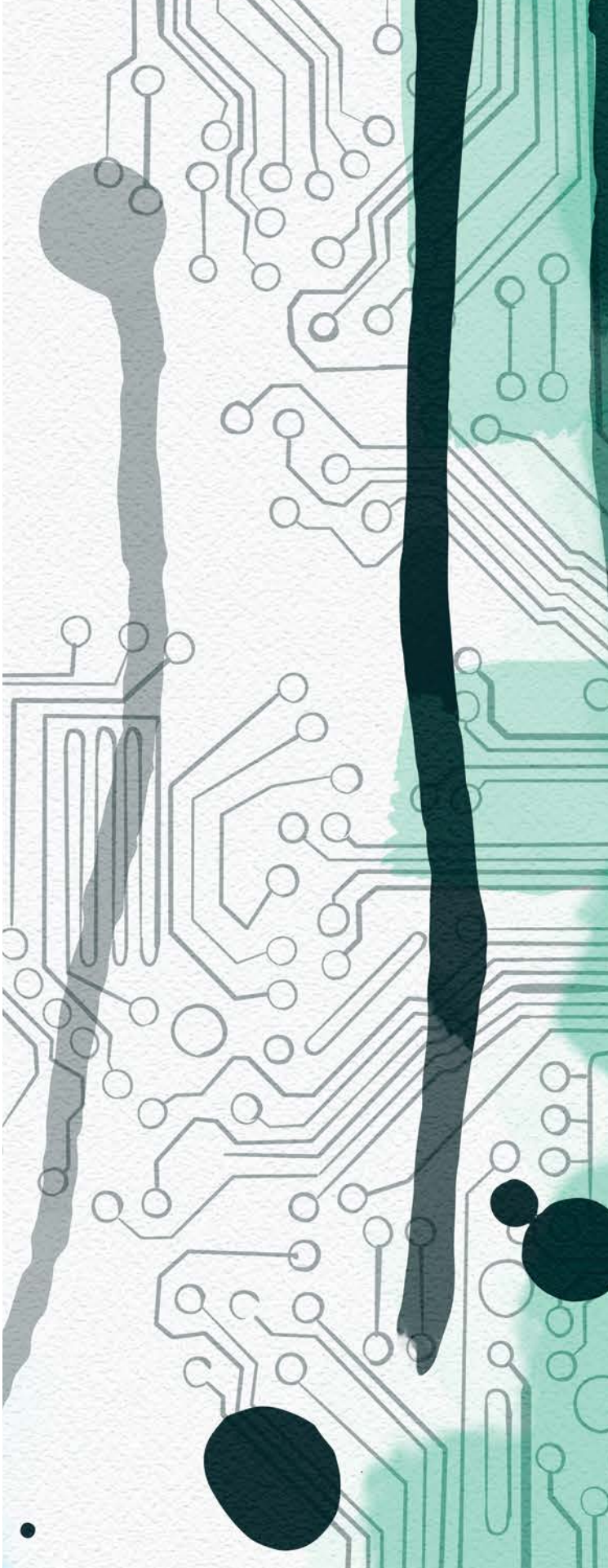
Stemming leadership leakage



WHEN IT COMES to developing talent in the digital age, companies often think of junior staff and younger employees. But what about the digital development needs of employees higher in the ranks, those likely to be in senior leadership roles in the not-too-distant future? Our multiyear global study of digital transformation with MIT *Sloan Management Review* finds employees at vice president (VP) and director levels have a striking willingness to leave an organization if they don't receive opportunities to develop in a digital environment. In fact, more than 15 times as many VP-level leaders told us they plan to leave their company within a year if they don't receive sufficient development opportunities, compared with peers who do.

To be clear, providing development opportunities at all levels can be critically important, and our study has for the past two years found employees at all levels are more likely to leave if they don't

have opportunities to develop their digital skills. Yet organizations should be alarmed by the greater willingness of some current and up-and-coming leaders to walk away: These are employees who likely have been groomed to succeed senior leaders. Their departure could be costly, not only with regard to losing their knowledge and skills, but the sunk costs of time and money spent developing them and the additional cost of recruiting and training replacements.

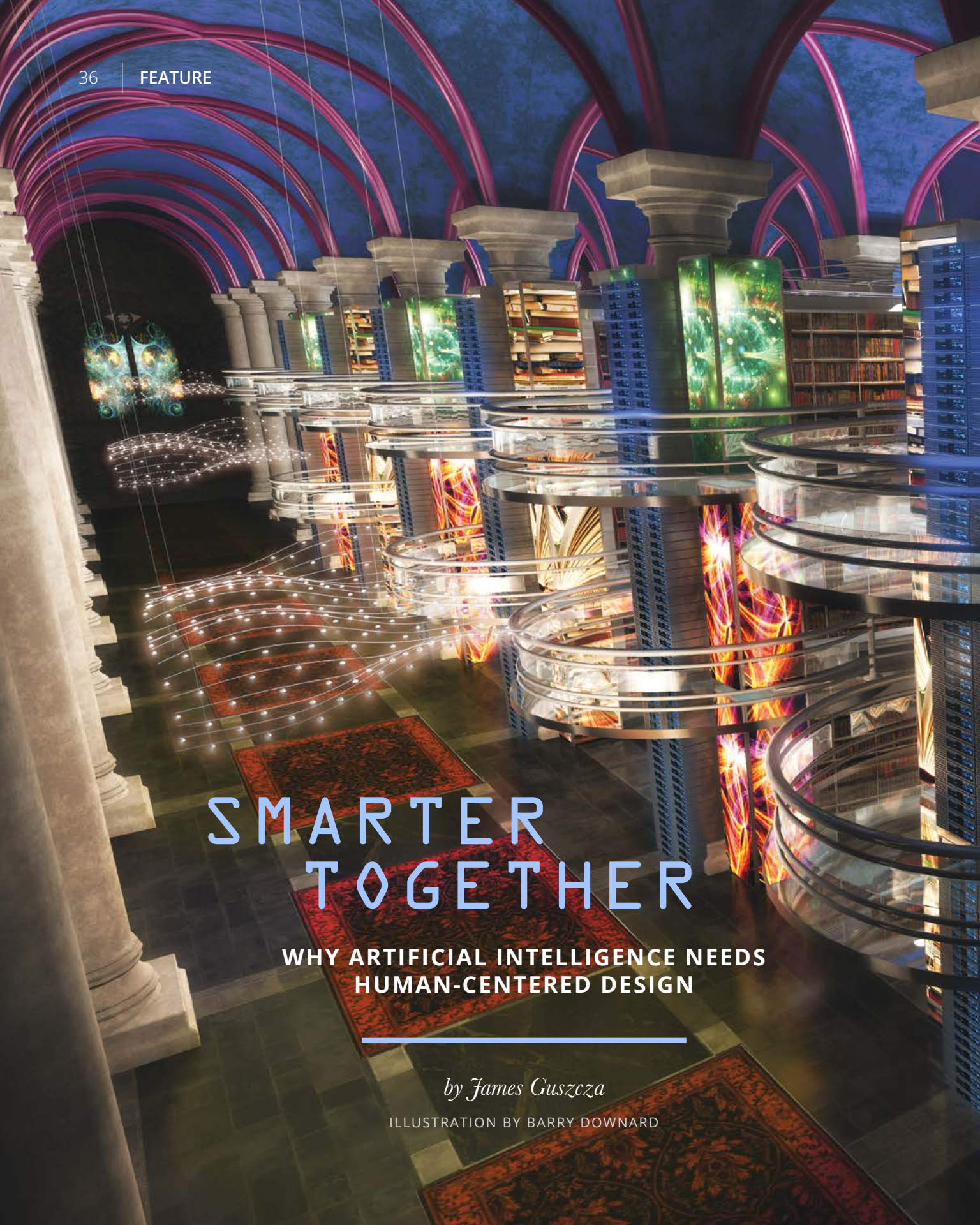
Employees are more likely to leave if they do not have the opportunities to develop digital skills.

Likelihood of leaving within one year at companies that do not provide opportunities to develop in a digital environment, compared with companies that do.

So what can organizations do? One way to stem potential leadership leakage may be to focus primarily on external recruiting, but that's often time-consuming and expensive. We found digitally maturing organizations typically offer more cost-effective strategies. Their approach to getting the right talent is often to develop and train existing employees—but it's usually not just about offering classroom and virtual training courses. Most of these companies seek to create an environment where employees are eager to continuously learn and grow—and the organization supports, feeds, and encourages that culture of learning. What's often needed is a multifaceted approach that includes opportunities provided directly (such as challenging roles and project assignments), as well as support for and encouragement of individually driven and/or externally led growth opportunities. These external programs could range from formal education to participation in digital platforms and communities to share ideas and gain new skills and experiences.

Finally, don't focus only on hard, technical skills. Developing in a digital environment typically also requires softer skills, particularly for leaders. Our research indicates the skills leaders most need to be effective are having a transformative vision, being forward-looking, being change-oriented, and having an understanding of technology and its impact on the business. These are nontechnical skills, and focusing on providing opportunities to develop them and build stronger digital skills is important to combating potential talent leakage. That can ultimately strengthen your organization's leadership pipeline. ●

For the full results of our third annual *MIT Sloan Management Review* and Deloitte study of digital business, read *Achieving digital maturity* on deloitte.com/insights.



SMARTER TOGETHER

WHY ARTIFICIAL INTELLIGENCE NEEDS HUMAN-CENTERED DESIGN

by James Guszcza

ILLUSTRATION BY BARRY DOWNARD

"Seekers after the glitter of intelligence are misguided in trying to cast it in the base metal of computing."

— Terry Winograd[1]

ARTIFICIAL INTELLIGENCE (AI) HAS emerged as a signature issue of our time, set to reshape business and society. The excitement is warranted, but so are concerns. At a business level, large "big data" and AI projects often fail to deliver. Many of the culprits are familiar and persistent: forcing technological square pegs into strategic round holes, overestimating the sufficiency of available data or underestimating the difficulty of wrangling it into usable shape, taking insufficient steps to ensure that algorithmic outputs result in the desired business outcomes. At a societal level, headlines are dominated by the issue of technological unemployment. Yet it is becoming increasingly clear that AI algorithms embedded in ubiquitous digital technology can encode societal biases, spread conspiracies and promulgate fake news, amplify echo chambers of public opinion, hijack our attention, and even impair our mental well-being.[2]

Effectively addressing such issues requires a realistic conception of AI, which is too often hyped as emerging "artificial minds" on an exponential path to generally out-thinking humans.[3] In reality, today's AI applications result from the same classes of algorithms that have been under development for decades, but implemented on considerably more powerful computers and trained on larger data sets. They are "smart" in narrow senses, not in the general way humans are smart. In functional terms, it is better to view them not as "thinking machines," but as cognitive prostheses that can help humans think better.[4]

In other words, AI algorithms are "mind tools," not artificial minds. This implies that successful applications of AI hinge on more than big data and powerful algorithms. *Human-centered design* is also crucial. AI applications must reflect realistic conceptions of user needs and human psychology. Paraphrasing the user-centered design pioneer Don Norman, AI needs to "accept human behavior the way it is, not the way we would wish it to be."[5]

This essay explores the idea that smart *technologies* are unlikely to engender smart *outcomes* unless they are designed to promote smart *adoption* on the part of human end users. Many of us have experienced the seemingly paradoxical effect of adding a highly intelligent individual to a team, only to witness the team's effectiveness—its "collective IQ"—diminish. Analogously, "smart" AI technology can inadvertently result in "artificial stupidity" if poorly designed, implemented, or adapted to the human social context. Human, organizational, and societal factors are crucial.

An AI framework

It is common to identify AI with machines that think like humans or simulate aspects of the human brain (for a discussion of these potentially misleading starting points, see the sidebar, "The past and present meanings of 'AI'," on page 43). Perhaps even more common is the identification of AI with various machine learning *techniques*. It is true that machine learning applied to big data enables powerful AI applications ranging from self-driving cars to speech-enabled personal assistants. But not all forms of AI involve machine learning being applied to big data. It is better to start with a *functional* definition of AI. "Any program can be considered AI if it does something that we would normally think of as intelligent in humans," writes the computer scientist Kris Hammond. "How the program does it is not the issue, just that is able to do it at all. That is, it is AI if it is smart, but it doesn't have to be smart like us."[6]

Under this expansive definition, the computer automation of routine, explicitly defined "robotic process" tasks such as cashing checks and pre-populating HR forms count as AI. So does the insightful application of data science products, such as using a predictive decision tree algorithm to triage emergency room patients. In each case, an algorithm performs a task previously done only by humans. Yet it is obvious that neither case involves mimicking human intelligence, nor applying machine learning to massive data sets.

Starting with Hammond's definition, it is useful to adopt a framework that distinguishes between AI for *automation* and AI for human *augmentation*.

AI for automation

AI is now capable of automating tasks associated with both *explicit* and *tacit* human knowledge. The former is "textbook" knowledge that can be documented in manuals and rulebooks. It is increasingly practical to capture such knowledge in computer code to achieve robotic process automation (RPA): building software "robots" that perform boring, repetitive, error-prone, or time-consuming tasks, such as processing changes of address, insurance claims, hospital bills, or human resources forms. Because RPA enjoys both low risk and high economic return, it is often a natural starting point for organizations wishing to achieve efficiencies and cost savings through AI. Ideally, it can also free up valuable human time for more complex, meaningful, or customer-facing tasks.

Tacit knowledge might naively seem impervious to AI automation: It is automatic, intuitive "know-how" that is learned by doing, not purely through study or rule-following. Most human knowledge is tacit knowledge: a nurse intuiting that a child has the flu, a firefighter with a gut feel that a burning building is about to collapse, or a data scientist intuiting that a variable reflects a suspicious proxy relationship. Yet the ability of AI applications to automate tasks associated with human tacit knowledge is rapidly progressing. Examples include facial recognition, sensing emotions, driving cars, interpreting spoken language, reading text, writing reports, grading student papers, and even setting people up on dates. In many cases, newer forms of AI can perform such tasks more accurately than humans.

The uncanny quality of such applications make it tempting to conclude that computers are implementing—or rapidly approaching—a kind of human intelligence in the sense that they "understand" what they are doing. That's an illusion. Algorithms "demonstrate human-like tacit knowledge" only in the weak sense that they are constructed or trained using data that encodes the tacit knowledge of a large number of humans working behind the scenes. The term "human-in-the-loop machine learning" is often used to connote this process.[7] While big data and machine learning enable the creation of algorithms that can capture and transmit meaning, this is very different from understanding or originating meaning.

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Given that automation eliminates the need for human involvement, why should autonomous AI systems require human-centered design? There are several reasons:

Goal-relevance. Data science products and AI applications are most valuable when insightfully designed to satisfy the needs of human end users. For example, typing "area of Poland" into the search engine Bing returns the literal answer (120,728 square miles) along with the note: "About equal to the size of Nevada." The numeric answer is the more accurate, but the intuitive answer will often be more useful.[8] This exemplifies the broader point that "optimal" from the perspective of computer algorithms is not necessarily the same as "optimal" from the perspective of end-user goals or psychology.

Handoff. Many AI systems can run on "autopilot" much of the time, but require human intervention in exceptional or ambiguous situations that

require common sense or contextual understanding. Human-centered design is needed to ensure that this "handoff" from computer to human happens when it should, and that it goes smoothly when it does happen. Here's an admittedly low-stakes personal example of how AI can give rise to "artificial stupidity" if the handoff doesn't go well. I recently hailed a cab for a trip that required only common sense and a tiny amount of local knowledge—driving down a single major boulevard. Yet the driver got lost because he was following the (as it turned out, garbled) indications of a smartphone app. A "low confidence" or "potentially high interference" warning might have nudged the driver to rethink his actions rather than suppressing his common sense in favor of the algorithmic indication.

This illustrates the general issue known as "the paradox of automation":[9] The more reliant we become on technology, the less prepared we are to take control in the exceptional cases when the technology fails. The problem is thorny because the conditions under which humans must take control require *more*, not less, skill than the situations that can be handled by algorithms—and automation technologies can erode precisely the skills needed in such scenarios. Keeping human skills sufficiently fresh to handle such situations might sometimes involve relying on automation less than the technology makes practical. Once again, "optimal" from a narrowly technological perspective might differ from "optimal" for a human-computer system.

> "The technology is the easy part. The hard part is figuring out the social and institutional structures around the technology."

Feedback loops. Automated algorithmic decisions can reflect and amplify undesirable patterns in the data they are trained on. A vivid recent example is Tay, a chatbot designed to learn about the world through conversations with its users. The chatbot had to be switched off within 24 hours after pranksters trained it to utter racist, sexist, and fascist statements.[10] Other examples of algorithms reflecting and amplifying undesirable societal biases are by now ubiquitous. For such reasons, there is an increasing call for chatbot and search-engine design to optimize not only for speed and algorithmic accuracy, but also user behavior and societal biases encoded in data.[11]

Psychological impact. Just as user behavior can impair algorithms, so can algorithms impair user behavior. Two serious contemporary issues illustrate the point. First, it is becoming increasingly clear that AI-enabled entertainment and social media applications can impair human well-being in a number of ways. Compulsive email checking can cause people to shortchange themselves on sleep and distract themselves on the job; excessive social media use has been linked with feelings of unhappiness and "fear of missing out"; and Silicon Valley insiders increasingly worry about people's minds being "hijacked" by addictive technologies.[12]

Second, there is increasing concern that the collaborative filtering of news and commentary can lead to "filter bubbles" and "epistemic gated communities" of opinion. In his recent book *#Republic*, legal scholar Cass Sunstein argues this can exacerbate group polarization and undermine reasoned deliberation, a prerequisite to a well-functioning democracy. He suggests social media recommendation engines be imbued with a form of human-centered design: the spontaneous, serendipitous discoveries of alternate news stories and opinion pieces to help ward off polarization and groupthink.[13] Sunstein analogizes this with the perspective-altering serendipitous encounters and discoveries characteristic of living in a dense, diverse, walkable urban environment.

In short, it can be counterproductive to deploy technologically sophisticated autonomous AI systems without a correspondingly sophisticated approach to human-centered design. As John Seely Brown presciently remarked, "The technology is the easy part. The hard part is figuring out the social and institutional structures around the technology."[14]

Yet automation is only part of the story. Algorithms can also be used to augment human cognitive capabilities—both System 1 "thinking fast," and System 2 "thinking slow." It is possible to achieve forms of human-computer collective intelligence—provided we adopt a human-centered approach to AI.

AI for augmented thinking slow

Psychologists have long known that even simple algorithms can outperform expert judgments at predictive tasks ranging from making medical diagnoses to estimating the odds a parolee will recidivate to scouting baseball players to underwriting insurance risks. The field was initiated in 1954, with the publication of the book *Clinical Versus Statistical Prediction* by psychologist and philosopher Paul Meehl.

Meehl was a hero to the young Daniel Kahneman, the author of *Thinking, Fast and Slow*,[15] whose work with Amos Tversky uncovered the human mind's surprising tendency to rely on intuitively coherent but predictively dubious narratives, rather than logical assessments of evidence. Behavioral economists such as Richard Thaler point out that this systematic feature of human psychology results in persistently inefficient markets and business processes that can be rationalized through the use of algorithm-assisted decision-making—"playing Moneyball."[16] Just as eyeglasses compensate for myopic vision, data and algorithms can compensate for cognitive myopia.

Meehl's and Kahneman's work implies that in many situations, algorithms should be used to *automate* decisions. Overconfident humans tend to override predictive algorithms more often than they should.[17] When possible, it is therefore best to employ human judgment in the design of algorithms, and remove humans from case-by-case decision-making. But this is not always possible. For example, procedural justice implies that it would be unacceptable to replace a judge making parole decisions with the mechanical outputs of a recidivism prediction algorithm. A second issue is epistemic in nature. Many decisions, such as making a complex medical diagnosis, underwriting a rare insurance risk, making an important hiring decision, and so on are not associated with a rich enough body of historical data to enable the construction of a sufficiently reliable predictive algorithm. In such scenarios, an imperfect algorithm can be used not to *automate* decisions, but rather to generate anchor points to *augment and improve* human decisions.

How might this work? A suggestive illustration comes from the world of chess. Several years after IBM Deep Blue defeated the world chess champion Garry Kasparov, a "freestyle chess" competition was held, in which any combination of human and computer chess players could compete. The competition ended with an upset victory that Kasparov subsequently discussed:

> The winner was revealed to be not a grandmaster with a state-of-the-art PC but a pair of amateur American chess players using three computers at the same time. Their skill at manipulating and "coaching" their computers to look very deeply into positions effectively counteracted the superior chess understanding of their grandmaster opponents and the greater computational power of other participants. Weak human + machine + *better process* was superior to a strong computer alone and, more remarkably, superior to a strong human + machine + inferior process. . . . Human strategic guidance combined with the tactical acuity of a computer was overwhelming.[18]

This idea that weak human + machine + better process outperforms strong human + machine + inferior process has been called "Kasparov's law." A

corollary is that user-centered design is necessary to both the creation and deployment of algorithms intended to improve expert judgment. Just as a cyclist can perform better with a bicycle that was designed for her and that she has been trained to use, an expert can make better decisions with an algorithm built with her needs in mind, and which she has been trained to use.[19]

To that end, human-centric AI algorithms should suitably reflect the information, goals, and constraints that the decision-maker tends to weigh when arriving at a decision; the data should be analyzed from a position of domain and institutional knowledge, and an understanding of the process that generated it; an algorithm's design should anticipate the realities of the environment in which it is to be used; it should avoid societally vexed predictors; it should be peer-reviewed or audited to ensure that unwanted biases have not inadvertently crept in; and it should be accompanied by measures of confidence and "why" messages (ideally expressed in intuitive language) explaining why a certain algorithmic indication is what it is. For example, one would not wish to receive a black-box algorithmic indication of the odds of a serious disease without the ability to investigate the reasons why the indication is what it is.

But even these sorts of algorithm design considerations are not sufficient. The overall decision *environment*—which includes both the algorithm and human decision-makers—must be similarly well-designed. Just as the freestyle chess winners triumphed because of their deep familiarity and experience with both chess and their chess programs, algorithm end users should have a sufficiently detailed understanding of their tool to use it effectively. The algorithm's assumptions, limitations, and data features should therefore be clearly communicated through writing and information visualization. Furthermore, guidelines and business rules should be established to convert predictions into prescriptions and to suggest when and how the end user might either override the algorithm or complement its recommendations with other information. End users can also be trained to "think slow," more like statisticians. Psychologists Philip Tetlock and Barbara Mellors have found that training decision-makers in probabilistic reasoning and avoiding cognitive biases improves their forecasting abilities.[20] Building accurate algorithms is not enough; user-centered design is also essential.

3D: Data, digital, and design for augmented thinking fast

Economic value comes not from AI algorithms, but from AI algorithms that have been properly designed for, and adapted to, human environments. For example, consider the "last mile problem" of predictive algorithms: No algorithm will yield economic value unless it is properly acted upon to drive results. While this is a truism, it is also one of the easiest things for organizations to get wrong. One recent study estimated that 60 percent of "big data" projects fail to become operationalized.[21]

A good example of model operationalization is the predictive algorithm used to rank all of the building sites in New York City in order of riskiness. Prior to the algorithm's deployment, roughly 10 percent of building inspections resulted in an order to vacate. After deployment, the number rose to 70 percent.[22] This is a classic example of predictive analytics being used to improve "System 2" decision-making, as discussed in the previous section. Still more value can be derived through the application of what behavioral economists call *choice architecture*, aka "nudges."[23] Consider risks that are either ambiguous or not quite dangerous enough (yet) to warrant a visit from the city's limited cadre of building inspectors. Such lesser risks could be prompted to "self-cure" through, for example, nudge letters that have been field-tested and optimized using randomized controlled trials (RCTs). Analogous "push the worst, nudge the rest" strategies can be adopted for algorithms designed to identify unhygienic restaurants, inefficient programs, unsafe workplaces, episodes of waste, fraud, abuse, or expense or tax policy noncompliance.

In certain cases, applying choice architecture will be crucial to the economic success and societal

acceptability of an AI project. For example, the state of New Mexico recently adopted a machine learning algorithm designed to flag unemployment insurance recipients who are *relatively* likely to be improperly collecting large unemployment insurance (UI) benefits. The word "relatively" is important. While the highest-scoring cases were many times more likely than average to be improperly collecting UI benefits, most were (inevitably) false positives. This counterintuitive result is known as the "false positive paradox."[24] The crucial implication is that naively using the algorithm to cut off benefits would harm a large number of citizens in genuine need of them. Rather than adopt this naive strategy, the state therefore field-tested a number of pop-up nudge messages on the computer screens of UI recipients performing their weekly certifications. The most effective such message cut improper payments in half: informing recipients that "99 out of 100 people in <your county> accurately report earnings each week."[25]

The human-centered nature of choice architecture can therefore enable AI applications that are at once economically beneficial and pro-social.[26] Furthermore, the case for choice architecture is stronger than ever in our era of big data and ubiquitous digital technologies. Fine-grained behavioral data of large populations may increasingly enable personalized interventions appropriate to individual cases. Imbuing our ever-present digital

THE PAST AND PRESENT MEANINGS OF "AI"

While the term "AI" has made a major comeback, the term has come to mean something quite different from what its founders had in mind. Today's AI technologies are not generally intelligent thinking machines; they are applications that help humans think better.

The field of artificial intelligence dates back to a specific place and time: a conference held at Dartmouth University in the summer of 1956. The conference was convened by John McCarthy, who coined the term "artificial intelligence" and defined it as the science of creating machines "with the ability to achieve goals in the world."[27]

McCarthy's definition is still very useful. But the conference attendees—including legendary figures such as Marvin Minsky, Alan Newell, Claude Shannon, and Herbert Simon—aspired to a much more ambitious goal: to implement a complete version of human thought and language within computer technology. In other words, they wished to create *general* artificial intelligence, modeled on human general intelligence. Their proposal stated:

> The study is to proceed on the basis of the conjecture that *every aspect* of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it. An attempt will be made to find how to make machines use language, form abstractions and concepts, solve kinds of problems now reserved for humans, and improve themselves.[28]

The proposal went on to state, "We think that a significant advance can be made in one or more of these problems if a carefully selected group of scientists work on it for a summer." This optimism might seem surprising in hindsight. But it is worth remembering that the authors were writing in the heyday of both B. F. Skinner's behaviorist psychology and the logical positivist school of philosophy. In this intellectual climate, it was natural to assume that human thought was ultimately a form of logical calculation. Our understanding of both human psychology and the challenges of encoding knowledge in logically perfect languages has evolved considerably since the 1950s.

It is a telling historical footnote that Minsky subsequently advised the director Stanley Kubrick during the movie adaptation of Arthur C. Clarke's novel *2001: A Space Odyssey*. That story's most memorable

(continued) >

THE PAST AND PRESENT MEANINGS OF "AI" *(continued)*

character was HAL—a sapient machine capable of conceptual thinking, commonsense reasoning, and a fluid command of human language. Minsky and the other Dartmouth Conference attendees believed that such generally intelligent computers would be available by the year 2001.

Today, AI denotes a collection of technologies that, paraphrasing McCarthy's original definition, excel at specific *tasks* that could previously only be performed by humans. Although it is common for commentators to state that such technologies as the DeepFace facial recognition system or DeepMind's AlphaGo are "modeled on the human brain" or can "think like humans do," such statements are misleading. An obvious point is that today's AI technologies—and all on the foreseeable horizon—are *narrow* AI point solutions. An algorithm designed to drive a car is useless for diagnosing a patient, and vice versa.

Furthermore, such applications are far from the popular vision of computers that implement (super) human thought. For example, deep learning neural network algorithms can identify tumors in X-rays, label photographs with English phrases, distinguish between breeds of animals, and distinguish people who are genuinely smiling from those who are faking it—often more accurately than we can.[29] But this does not involve algorithmically representing such concepts as "tumor," "pinscher," or "smile." Rather, deep learning neural network models are trained on large numbers of digitized photographs that have already been labeled by humans.[30] Such models neither imitate the mind nor simulate the brain. They are predictive models—akin to regression models—typically trained on millions of examples and containing millions of uninterpretable parameters. The technology can perform tasks hitherto performed only by humans; but it does not result from emulating the human brain or mimicking the human mind.

While such data-driven AI applications have massive practical applications and economic potential, they are also "rigid" in the sense that they lack contextual awareness, causal understanding, and commonsense reasoning capabilities. A crucial implication is that they cannot be relied on in "black swan" scenarios or environments significantly different from those they were trained in. Just as a credit scoring algorithm trained on data about US consumers would not yield a reliable score for an immigrant from another country, a self-driving car trained in Palo Alto would not necessary perform as well in Pondicherry.

technologies with choice architecture better can improve both engagement and outcomes. Health wearables are a familiar example. Prominent behavioral health experts point out that such devices are facilitators—but not drivers—of better health behaviors.[31] Using such wearables to merely gather data and generate information reports is simply not enough to prompt most of us to follow through and change our behaviors. A more promising strategy is to use data gathered by wearables to target, inform, and personalize such nudge tactics as peer comparisons, commitment contracts, gamification interventions, and habit-formation programs.[32]

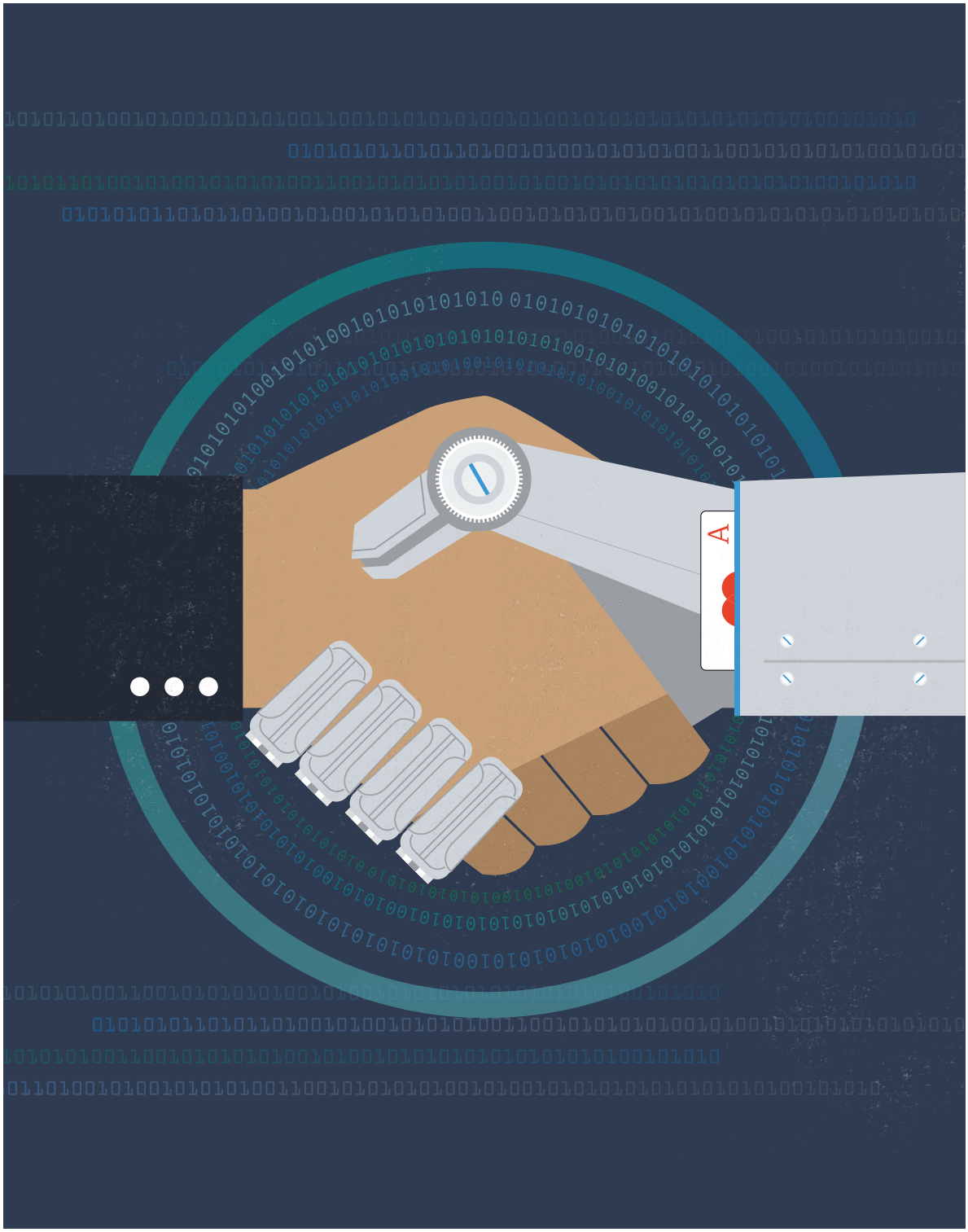
This illustrates a general principle that might be called "3D": *Data* and *digital* tech are facilitators; psychologically informed *design* is also needed to drive better engagement and outcomes. 3D thinking can enable innovative products and business models. Consider, for example, the telematics data emanating from cars connected to the Internet of Things, which insurers already use to more accurately price personal and commercial auto insurance contracts. This data can also be used to spur loss prevention; a young male driver might be given a discount on his expensive auto insurance policy if he follows data-generated prescriptions to improve his driving behaviors. Choice architecture enables a further idea: Natural language generation tools could be used to automatically produce periodic data-rich reports containing both helpful tips as well as peer comparison nudge messages. For example, being informed that his highway-driving is riskier

than that of most of his peers might be a highly effective, low-cost way to prompt safer driving. Such strategies can enable insurers to be less product-centric and more customer-centric in a way that benefits the company, the policyholder, and society as a whole.

Whether intended for automation or human augmentation, AI systems are more likely to yield economic benefits and societal acceptability if user needs and psychological factors are taken into account. Design can help close the gap between AI algorithm *outputs* and improved *outcomes* by enabling better modes of human-computer collaboration. It is therefore fitting to give the last word to Garry Kasparov, from his recent book, *Deep Thinking*: "Many jobs will continue to be lost to intelligent automation. But if you're looking for a field that will be booming for many years, get into human-machine collaboration and process architecture and design."

Both figuratively and literally, the last word is: design.

JAMES GUSZCZA is Deloitte Consulting's US Chief Data Scientist, based in Santa Monica, California.



AI-augmented cybersecurity

HOW COGNITIVE TECHNOLOGIES CAN ADDRESS THE CYBER WORKFORCE SHORTAGE

by Deborah Golden and Ted Johnson

ILLUSTRATION BY EMILY MOREANO

IT MAY SEEM counterintuitive, but 0 percent unemployment in an industry is not a good thing. It's often accompanied by high turnover, salary inflation, skill mismatches between workers and the positions they fill, and numerous vacant positions. Yet this condition seems to be the reality for cybersecurity professionals, one of the most consequential professions supporting an increasingly interconnected world. The demand for adequately trained and knowledgeable cyber personnel far exceeds the available talent pool.

Recent reports confirm this situation to be true, and it's unlikely to get better anytime soon: Cybersecurity unemployment is at 0 percent with more than 1.5 million job openings anticipated globally by 2019.[1] Meanwhile, cyberthreats are increasing, and the annual cost of cybercrime is expected to rise from $3 trillion today to $6 trillion by 2021.[2] This statistic is particularly troublesome news for government agencies responsible for protecting their citizens and corporations defending against crime. In an attempt to address this demand, federal and commercial marketplaces plan to spend $1 trillion globally on cybersecurity products and services between now and 2021.[3]

With no signs of the cyber workforce shortage letting up, new strategies should be devised to best utilize the available talent and meet public and

private cybersecurity objectives. One of the most promising approaches is to combine cognitive technologies with cybersecurity professionals; this can address the myriad activities faced by the industry and ultimately aid in addressing the shortage of available talent. Through the use of advanced analytics, automation, and artificial intelligence, it's possible to "train the technology" to deliver key insights that optimize cyber professionals' work, streamline operational processes, and improve security outcomes. These efficiencies could permit a reallocation of cyber talent as well as the realignment of the tasks they perform, resulting in a more holistic approach to help mitigate the effects of a workforce shortage.

In an effort to challenge the traditional means in which cybersecurity is addressed, private and public organizations should rethink their approach toward talent and consider leveraging cognitive technologies to facilitate more cybersecurity insights in less time. Such an approach may enable a more secure cyber environment by taking targeted, proactive measures to prevent incidents before they happen.

All in a day's work

Before tackling the cyber talent shortage, one basic question should be addressed: What do cybersecurity professionals do? The answer would seem to be straightforward enough, but the field has grown so large and complex that *cybersecurity professional* has often become a catch-all term that embodies a range of specializations, skills, and job functions. Some are experts with deep technical skills focusing on software development or digital forensics. Others specialize in the legal and administrative aspects of the profession, such as privacy, compliance, or customer service. And there are those practitioners who are self-taught, holding a number of certifications but with little "on-the-job" experience applying those skills. Just as each baseball position requires specific talents—pitchers and catchers are not interchangeable—cybersecurity professionals, too, often have different skills and responsibilities. These distinctions can be critically important in order to understand the quantity and quality of a cyber workforce.

To further complicate the issue, there is often great variability in how public and private organizations define cybersecurity and cyber-related skills. Some law enforcement agencies define cyber skills as active work—hacking into criminal organizations, tracking stolen credit card numbers, and determining the locations of criminally operated servers—as opposed to defensively operating firewalls and scanning the network for breaches, which many private-sector cybersecurity analysts perform on a day-to-day basis. Furthermore, an information security officer in one organization may be spending a lot of time on network administration and securing information-sharing sites, while another in that same position at a different organization is performing physical security work—or even law enforcement activity. These differing views of job responsibilities can lead to confusion when describing cybersecurity skills and shortages. Ultimately, they can result in a potential mismatch of resources to responsibilities, reducing professionals' overall ability to provide the most impactful coverage of the cyber environment.

In a 2010 report, the Center for Strategic and International Studies highlighted the need to outline cybersecurity job descriptions and facilitate alignment across the industry. The study recommended that the US federal government should "sponsor an effort to create an initial taxonomy of cyber roles and skills," ensure alignment between desired workforce skills and certification and licensing requirements, and develop a standard occupational classification for the cybersecurity workforce.[4] To facilitate this approach, the report proposed job descriptions for a number of cyber roles that were eventually incorporated into executive guidance from the White House. It also encouraged the use of executive surveys, college graduate recruitment strategies, and legislation to identify and address workforce shortages.

An intelligence official noted that to be effective in cyberspace, the United States needs about 30,000 people with specialized security skills—it

currently has 1,000.[5] And the shortage extends beyond highly technical talent; it includes those with niche skills who can write secure code, design secure network architectures, and develop software tools for network defense and reconstitution following an event.[6]

In partial response to these recommendations and the clear need for specific cyber talent, the National Institute of Standards and Technology created a working group, the National Initiative for Cybersecurity Education (NICE), to help set standards that categorize and describe cybersecurity work. Titled the NICE Cybersecurity Workforce Framework, it maps skills to 7 categories, 33 specialty areas, and 52 work roles.[7] With common terminology, it can be much easier to identify and communicate exactly which skills are in short supply, which specialties can best leverage insights from cognitive systems, and which tasks can be automated.

The characterization of cybersecurity jobs can play an important role in helping an organization identify and devise tailored technological solutions to address the workforce shortage. For example, some of the defined duties of a secure network administrator are typically to identify security weaknesses in network architectures, divert unwanted traffic, and characterize expected network behavior—all tasks that can benefit tremendously from insights derived from data analytics and automation. Whether helping threat analysts monitor anomalous traffic, security auditors scan wireless connections, or network engineers block malicious packets, cognitive technologies can be leveraged to help reshape the existing talent's workload. Once a sound understanding is gained of all the activities carried out by cybersecurity professionals, it is much easier to determine which can be addressed by cognitive systems, which require human talent, and how much of the workforce shortage can be addressed.

Ultimately, while there are commonalities, every organization and government agency is unique in its needs and resources. There is no one-size-fits-all solution that will address the talent challenges across sectors, regions, and positions. Thus, in order to grasp the specific effects the talent shortage is having, each organization should craft an accurate picture of the responsibilities and tasks assigned to each of its cybersecurity positions. With this information in hand, it can begin exploring how cognitive technologies can address the shortage.

Racing with the machine

Skilled cybersecurity personnel across the spectrum of roles are typically highly prized, practicing what is more of an art than an exact science. And they, perhaps better than anyone else, understand the state of the profession. Recent studies show that 82 percent of cybersecurity professionals from eight different countries report a shortage of cybersecurity skills; 71 percent believe this shortage does direct and measurable damage; and 76 percent believe there isn't enough investment in cybersecurity talent.[8]

Cybersecurity professionals agree: Nine out of ten believe that technology could help compensate for skill shortages, and that "the solutions most likely to be outsourced are ones that lend themselves to automation" and other cognitive technologies.[9] Here again, a framework to define and categorize skills can be useful. In identifying the work roles that are best suited to technological solutions and those where cognitive technologies can support faster, smarter human decision-making, the cyber talent shortage can be addressed—or at least the gap may be minimized.

THE ROLE FOR COGNITIVE TECHNOLOGIES

So what exactly *are* cognitive technologies and how might they address the talent shortage? *Cognitive computing* refers to the "systems that learn at scale, reason with purpose, and interact with humans naturally."[10] They include technologies such as artificial intelligence, text and speech processing, automation and robotics, and machine learning. Their use can typically be categorized in three primary ways: in product applications to improve customer benefits, in process applications

to improve an organization's workflow and operations, and for insights that can help inform decisions.[11]

For example, an executive at a leading investment firm noted its cybersecurity analysts were spending 30 to 45 minutes working through checklists in the course of investigating security alerts. Moreover, because the work was monotonous, the analysts began skipping steps, resulting in less rigorous examinations of incidents. But by automating the process, investigations were conducted in *40 seconds*, and analysts were freed up to focus on remediation. The end result? Productivity of analysts tripled, with each one doing the work it would have taken three people to do prior to the integration of automated processes.[12] Not only did this help address the firm's talent shortage, but it seemed to aid in retention as well—employees were more satisfied now that the tedium of checklist completion was replaced with more challenging and exciting work.

With talent already in short supply, time spent on tasks requiring little human problem-solving ability wastes the skills and limited resources available to an organization.

But to truly leverage the power of cognitive technologies, an organization could have employed data analytics to examine extremely large amounts of network traffic. One estimate shows that "a medium-size network with 20,000 devices (laptops, smartphones, and servers) will transmit more than 5 gigabits of data every second and 50 terabytes of data in a 24-hour period."[13] Using supercomputers and artificial intelligence systems to analyze such large data streams could have helped detect advanced threats in near-real-time, identified the most likely types of attacks against the network, revealed patterns of network and user behavior for stronger authentication procedures, and improved management of all devices connected to the network. Thus, analysts would not only accomplish more in less time, their workload would be focused and prioritized on the most pressing issues.

Importantly, such technological advances also require savvy cyber professionals with a particular set of skills that can recognize and act on the insights gleaned from processing big data sets. Just as the cyberthreat is emblematic of a changing world, the talent required to mitigate those threats should also change and adapt to the evolving security environment. Cognitive technologies can help direct the efforts of these professionals, thereby getting the best utilization of their time and skills.

Ultimately, cognitive technologies can mitigate the effects of cyber talent shortages in two primary ways. First, the lingering, unaddressed, or low-priority cybersecurity issues resulting from personnel strains and shortages can be remedied by applying cognitive technologies. And second, they can help inform smarter decisions through the use of artificial intelligence and advanced techniques, such as

data analytics, which permits a forward-looking, predictive approach to security challenges.

MOVING FROM THE MUNDANE

Discussions concerning the greater use of automation and similar tools for repetitive, mundane, and administrative tasks are sometimes met with the fear that "robots are taking our jobs." As such, there is often worry and consternation surrounding efforts to integrate more cognitive technologies into different industries. When grocery stores brought in self-checkout kiosks, cashiers feared they'd no longer be needed. The advent and widespread adoption of ATMs caused many to believe that bank tellers were on the brink of becoming passé. But in both instances, the number of grocery store cashiers[14] and bank tellers[15] actually grew over time, and neither seem in any danger of becoming obsolete.

In the cybersecurity profession, the automation of these sorts of tasks is typically welcomed. With talent already in short supply, time spent on tasks requiring little human problem-solving ability wastes the skills and limited resources available to an organization. A recent study found that organizations spend about 21,000 hours investigating false or erroneous security alerts at an average cost of $1.3 million annually.[16] These alerts could be handled by cognitive systems, which would only notify cybersecurity personnel when more investigation is warranted. Similarly, compliance reporting, security checklists, and standard network administration tasks could also be managed through automation, resulting in additional time and cost savings. And given its size, budget, and scope of responsibilities, the federal government's savings on its nearly $20 billion cybersecurity budget could be quite significant.[17]

By conducting a detailed analysis of the time its cyber talent spends on particular tasks, organizations can identify the time and money spent on such activities to determine the size of the benefit from automation. Moreover, they may have a much better understanding of where their skills shortage is most acute. As a result, the time and talent recovered from integrating cognitive technology can be smartly reallocated to where they are needed most.

EXTENDING THE CYBER WORKFORCE

Perhaps a greater benefit of cognitive technologies than the automation of repetitive tasks is the analysis of large data sets to identify insights and discern patterns that may have otherwise gone unnoticed. The amount of activity and alerts that occur in and around networks is simply too vast and complex for detailed human examination, even if no workforce shortage existed. But with the assistance of advanced analytics and machine learning, cyber professionals can more quickly pinpoint the cause of issues or even address incidents before they occur. This pairing of data-derived insights with skilled personnel is an especially potent combination that can significantly reduce the impacts of a talent shortage.

Consider predictive cyber analytics. This technique uses supercomputer processing power to sift through extremely large sets of data to identify malicious code, anomalous patterns, and other network threats that may not be readily apparent. When these insights are combined with an organization's knowledge of its own network, cyber professionals can identify the network's weak points, characterize the type of attacks the network is most susceptible to, and prioritize addressing the pertinent vulnerabilities. In this way, human-machine teaming can produce better outcomes in less time.

One of cognitive technologies' greatest advantages for cybersecurity is that they allow organizations to take a proactive approach instead of the more prevalent reactive stance. Being able to predict where threats are most likely to occur, and then prevent them before they do, can change the security paradigm. Cognitive technologies can also contribute to behavioral analytics that can defend against insider threats, identify compromised credentials of employees, or quickly detect breaches. And machine learning allows networks to learn in real time so that when malicious or anomalous events

occur, mitigation can begin immediately based on a set of programmable rules or human direction.

Interactive data analysis, proactive discovery, and threat characterization can empower cyber professionals and extend their capabilities far beyond the scope of what could be accomplished alone by even the most talented workforce. With these tools, cyber talent can be more precise in the application of their skills and resolve most issues in much less time.

COGNITIVE CONSONANCE

In a tight information technology and cybersecurity skills market, professionals are usually more than willing to race with the machine instead of raging against it. They are not worried about whether they will lose their jobs to automation, but rather how their jobs will change with its adoption.

Cognitive technologies can manage rote security tasks such as resetting passwords and deactivating malicious hyperlinks in phishing emails, only pushing specific incidents to analysts for further review. They can detect when a network is being attacked and respond at machine-speed to reduce impact. Data analytics and machine learning algorithms can identify threats to a network before attacks occur and recommend measures to address those vulnerabilities. They can scan the reams of legal and regulatory requirements and identify insights that help reduce the number of hours personnel spend on manual compliance and administrative work. And they can automate routine security updates and functions to ensure a network's hygiene doesn't lapse due to human error. A cybersecurity professional's time and talents are put to best use when paired with cognitive technologies (see figure opposite).

Put simply, cognitive technologies used for cybersecurity are not a job taker, but a job reallocator. These capabilities allow companies to address workforce shortfalls by reassigning existing personnel without needing to hire or let staff go, while also improving processes and adding rigor to decision-making.

Evolving approaches to cybersecurity

The effect of integrating cognitive technologies to address talent shortages often goes beyond insights from advanced analytics and automating specific tasks and actions. It changes the organization, too. Operations change. Workflow changes. Office structure and relationships change. And the processes associated with hiring, training, and retaining talent change. These evolutions are required to meet the demands of cybersecurity operations, compensate for talent shortages, and incorporate cutting-edge technology.

Ultimately, a strategic approach should be taken to integrate cognitive technologies and reallocate cyber talent. Organizations will need to gauge their internal demand for cybersecurity services informed by the threats they face, create a supporting talent strategy for the skill sets they need most, and ensure they are organized in the best way to accomplish their security objectives.

THREAT ENVIRONMENT

Before an organization hires additional cybersecurity staff or reshuffles its current employees, it should first look at its threat environment and related vulnerability data. Federal agencies have often been targeted because of the vast amounts of personally identifiable information they hold, such as social security numbers, fingerprint scans, and security clearance investigation materials.[18]

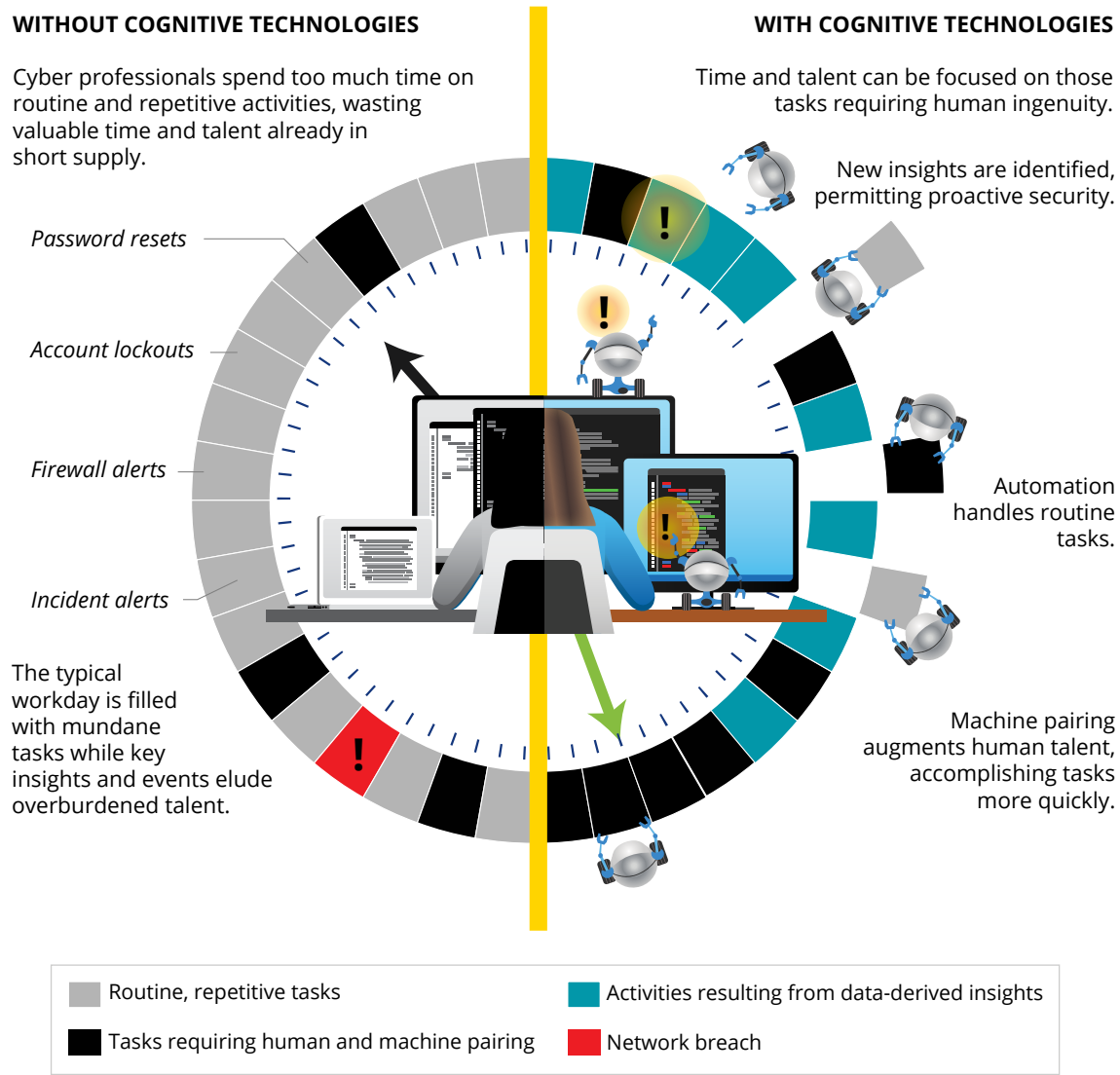
Telecommunications companies have faced denial-of-service threats, particularly with the proliferation of Internet of Things devices. Retail corporations and banks have been victims of cybercrime in which credit card numbers or related financial transaction data have been stolen. Hospitals have been increasingly singled out for ransomware attacks where hackers hold medical information hostage until a payoff is made. And phishing attacks have been the most prevalent form of delivering advanced, persistent threats and are responsible for 95 percent of all successful attacks on enterprise networks in all sectors.[19]

Knowing which data is most targeted by hackers and which methods they use to compromise networks can help prioritize cybersecurity efforts and the skills necessary to accomplish them.

TALENT STRATEGIES

Organizations should use the same analytic rigor devoted to key business and risk-based decisions and apply it toward hiring, training, and retention strategies. To accomplish this, they need to better understand the data they have and how best to make use of it to glean insights on workforce strengths and areas for improvement. This approach can help predict workforce needs, which skill sets are available within the organization, and which areas can be augmented by cognitive technologies. Naturally,

The cyber professionals' workload



these requirements change over time, so companies and federal agencies should have an ongoing dialogue about their talent pools. Leaders should routinely ask: Do we have the right workforce skills? Are we automating the right things? Are we letting humans do the right work?

To fill cybersecurity openings, experienced personnel can be hired, or new graduates could be trained and groomed over a period of time. However, advanced analytics and automation reduce the workload of current personnel so that organizations can identify who could be retrained to fill some of the existing job vacancies. And the cost of retraining them is typically going to be a better value addition than trying to hire experienced people in an incredibly competitive market. Further, practitioners note that although industry demand for cyber talent is growing at 11 percent per year, American universities are only meeting 5 percent of that annual growth.[20] The advantages of in-house hires through talent reallocation seem immediately obvious.

But where is the talent reallocated? Simply shifting personnel without deliberate matching of skills, aptitude, and preferences can have detrimental effects on an organization, its mission, and the retention of its workforce. As indicated above, cybersecurity professional tracks are rapidly evolving and many require specialization. Organizations have had the most success with their cybersecurity personnel by developing individually tailored career progression plans.[21]

Returning to bank tellers and the advent of ATMs, banks found that the teller job evolved once people began using machines for simple transactions. So while cash-handling became a less important skill for tellers to have, interpersonal skills became more critical since customers who came into banks had more complex transactions and questions that required more human interaction.[22] Some tellers were not as well-equipped for this new role, but banks recognized that displaced cash handlers were detail-oriented, good with numbers, quick learners, and able to focus over long periods of time—the same skill sets that some cybersecurity jobs require, such as regulatory and compliance positions.[23] As a result, some banks began training transition tellers for cybersecurity jobs. This is a win-win outcome for workers and banks alike.

Talent reallocation not only provides an opportunity to tailor-match personnel to open positions, it also aids in retention; as workers engage in work better suited to their talents, there is less turnover, reducing the amount of effort required to find and attract outside talent. Further, cognitive systems can enable the reallocation of specific parts of each individual's workload so that daily tasks can be geared toward solving more complex issues.

INTERNAL PROCESSES AND STRUCTURES

New technologies, talent placements, and the ever-present cybersecurity threat will require many organizations to reconsider the roles of their most senior cyber professionals. For many firms, there seems to be a disconnect between chief information officers, chief technology officers, and the human resources department. Further, these senior positions are relatively new additions to the executive level and must contest for resources and prioritization without the advantage of an organizational history that helps validate their requests.

One part of this many-sided challenge regarding cybersecurity leadership is often determining who is responsible for managing operations. Whom do the cyber professionals report up to? Is it a chief information officer, a chief risk officer, or a chief operating officer? Where does responsibility for the work belong?

Some of the difficulties associated with hiring and retaining skilled cybersecurity staff can stem from internal issues within an industry or individual organizations, specifically as it relates to structure and accountability. To get this right, organizations should focus on placing skilled personnel in the right positions with the right amount of authority and influence within the organization. If they do not have the right people in this area, then they likely cannot recruit them, retain them, or train them.

Because cybersecurity is a highly specialized and technical pursuit, it can seem out of place in some traditional boardrooms. However, if cybersecurity

challenges, opportunities, and objectives are not integrated into an organization's business decisions, there could be insufficient structural support and accountability to allow for secure and efficient operations. One way to evolve this norm is to incorporate the ideas and input of cybersecurity professionals, from junior personnel up through executives. Once they are fully incorporated and empowered, an organization could be optimally positioned to meet its cybersecurity objectives.

Meeting the challenge

The cybersecurity threats facing public- and private-sector organizations require that they be secure, vigilant, and resilient. This objective is complicated by the widespread shortage of cybersecurity professionals. As other industries have shown, however, cognitive technologies can assist in addressing cybersecurity personnel shortfalls and provide organizations the latitude to reallocate talent to more complex and rewarding positions. But this will require significant forethought and deliberate actions to ensure security and talent objectives are met.

While there is a talent shortage within the cybersecurity profession, there is no shortage of talent in the US or global workforce from which public and private organizations can draw. Organizations that can best integrate cognitive technologies to address labor shortfalls may find an abundance of hidden talent and approaches ready to take on new challenges.

DEBORAH GOLDEN is a principal in Deloitte's Advisory practice, with more than 20 years of information technology, security, and privacy experience encompassing various industries. She specializes in cyber risk services within the federal, life sciences and health care, and financial services industries.

TED JOHNSON is the Defense and National Security research manager with Deloitte's Center for Government Insights. He is a retired commander in the United States Navy, where he primarily focused on cyber policy and signals intelligence.

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Do you need help being human?

IF THERE'S A single word that sums up how many workers feel about the economy of recent decades, a good one could be "angst." Our increasingly competitive, interconnected world has demanded cost savings and efficiencies, pushing many workers across organizations to act more like machines. And the acceleration of digital technologies only seems to be adding a new layer of pressure, with the "always on" erosion of work-life balance and the threat of redundancy as machines not only outperform us at standardized tasks, but increasingly at more complex, value-added work.

The good news is it's not all bad news. We believe the world is actually in the early stages of a shift from this angst economy to one defined by the uniquely human attributes of creativity, curiosity, imagination, and social intelligence. They're the attributes

no machine can (yet) replicate, and it's humans that can offer the best answer for organizations seeking new ways to create value in a rapidly changing environment, especially when customers are often less willing to accept the standardized products and services that large companies were traditionally designed to provide.

Yet we may be our own worst enemies when it comes to unlocking this uniquely human potential. At a time when companies commonly need workers who will take on challenges, push boundaries, and connect with others in order to develop better ideas and more creative approaches, our survey of more than 4,500 Americans found while 51 percent were willing to risk failure for the sake of innovation, 41 percent said potential negative consequences stopped them from taking action. Some 49 percent said they were uncomfortable with unfamiliar situations, 54 percent felt uneasy about making decisions with an uncertain outcome, 52 percent disagreed with the idea that rules are made to be broken, and 43 percent liked to know what to expect each day.

Taken together, these responses suggest that, for a significant portion of the workforce, rules—in the form of processes and policies—and concern about penalties and threats to job security can stand in the way of taking risks and improvising. That can be problematic when workers who don't innovate and learn will likely find themselves increasingly marginalized in a rapidly changing and unpredictable business environment.

It all means that if we are to make the shift from angst to creativity, many companies have a choice: keep focusing on standardization and cost savings and push workers into a defensive stance of irrelevance and ineffectiveness, or focus on using available technology to offload the routine, free up human capacity, and tap into and cultivate the passion in your workforce. We define worker passion as comprising three attributes: questing, connecting, and commitment. While only 13 percent of the US workforce currently has all three, companies can help move workers from being rule-following automatons to creative problem solvers who will seek out difficult challenges and connect with others to make a significant and increasing impact. Leaders should consider:

- **Leading by example**. Commit to making a personal change, not just an organizational one. Ask yourself: What is keeping me from stepping up with enthusiasm for the challenge rather than fearing failure?
- **Providing focus**. Specialization and silos often prevent employees from gaining the perspective needed to address, or even be aware of, challenges. Help employees recognize what's interesting or important about new challenges.
- **Creating the environment**. Rethink performance measurement to encourage employees to work with, and seek challenges with, others. Celebrate efforts that create knowledge that might lead to higher performance, and eliminate the real disincentives that prevent all but the bravest from taking risks.

For more on how you can build a workforce for tomorrow, read *If you love them, set them free* on deloitte.com/insights.

Can CEOs be un-disruptable?

WHY TODAY'S BEST LEADERS ARE FLEXIBLE, NOT STEADFAST

by Benjamin Finzi, Mark Lipton, and Vincent Firth

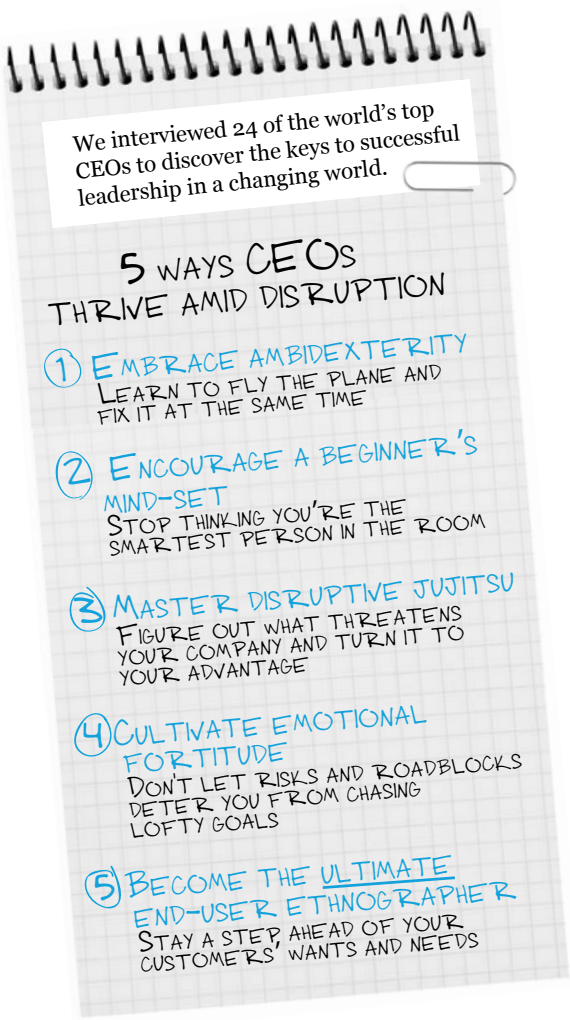
ILLUSTRATION BY RICHARD MIA

CHIEF EXECUTIVES HAVE traditionally sat at the intersection of the external environment and the internal organization, observing chaos and translating it into clear and actionable instructions. At this "nerve center" for essential information, our popular perception of the "un-disruptable" CEO is of a rigid, impenetrable figure, successfully staring down external adversity. Whether this image ever truly matched reality is debatable, but we know one thing for sure: It definitely no longer applies. To be un-disruptable today requires much more than steering companies through singular (if monumental) events—it demands that leaders navigate constant turbulence, continuously adjusting their actions accordingly.

Accelerating market forces and increasing environmental complexity mean companies often getting no warning before chaos, and no recovery period afterward. (For more on the accelerating pace of disruption, see the sidebar, "Placing disruption in perspective," on page 66.) Against this backdrop, leadership is about more than just translating order into chaos. Today's CEOs seem required to maintain constant pressure to transform their organizations by cultivating a high tolerance, if not a passion, for ambiguity—and to infuse others with the same mind-set. In a volatile world, today's leaders need flexibility, agility, and a willingness to extend their organization's capabilities into new and, sometimes, unexpected areas to keep ahead of relentless competition.

Five characteristics of an un-disruptable CEO

To better understand this shifting CEO role—and to uncover the qualities and skills leaders need to meet the demands of their positions in the future—we interviewed the CEOs of 24 massive, complex, global organizations in industries spanning banking, pharma, technology, natural resources, food processing, health care delivery, retail, and manufacturing.[1] We didn't data mine for CEOs leading un-disrupted organizations—if such companies exist—but chose our interview subjects based on organizational profile and industry diversity. All firms met the criteria for inclusion in the *Fortune* 250 and either matched or exceeded their peers in terms of standard financial metrics. Our mission was to attempt to answer this question: *What does it take to be un-disruptable today, and what will be demanded of CEOs and their organizations to avoid disruption tomorrow?*



Our discussions gave us a glimpse into the CEOs' heads and hearts. We wanted to see what they wished they could do better, do more of, or do differently to fend off their interpretation of disruption. What emerged were 20 factors identified as important to cultivating resilience to disruption, and five characteristics that were particularly significant. To be sure: Our subjects are not claiming that they exhibit all or most of these factors, nor did they suggest it was easy to adopt them given the challenges CEOs face both personally and, particularly, institutionally, where obstacles to change are often deeply embedded. But the leaders we interviewed viewed them as essential aspirations.

1. EMBRACE AMBIDEXTERITY

"One of our problems right now is you've got to fly the plane while you're changing it. So we've got to meet today's demands efficiently while we're simultaneously putting tens of millions of dollars into potentials for tomorrow. What's the right balance of investing in today's efficiency and building tomorrow's next big idea?"

—Pharmaceutical CEO

Yogi Berra once famously declared: "If you come to a fork in the road, take it." Deciding to pursue more than one path—focusing simultaneously on the present as well as on the riskier future—may not seem particularly radical.[2] Yet the CEOs we interviewed saw a different breed of ambidexterity: an urgent, continuous need to *relentlessly and simultaneously* execute both exploitation and experimentation. Rather than attempting to manage tensions and internal conflicts by creating future-focused

organizational skunkworks for exploration and risk-taking while tightly managing other units proficient at squeezing out costs (the practice of ambidexterity most used to date), they talked about the need for cultivating the tension between exploitation and exploration in a fully integrated organization. They stressed the challenge of embedding these oppositional elements across all processes, structures, and cultures, rather than extracting exploitation in one unit and experimentation in another.

Our interviewees commented frequently on this tension, driven in part by important external stakeholders—particularly analysts and shareholders—who want short-term yields, yet expect CEOs to work for the long term, take risks, and innovate. To be sure, the paradoxical ability to excel at both reliable profitability and risky breakthroughs—to seek opportunities that spark radical innovation while simultaneously optimizing existing capabilities—is no walk in the park.[3] In reality, if incumbents want to stay ahead of the curve, they should forever be enhancing current operations *and* exploring the continually emerging new frontier.

Ambidexterity, with this "twist" of integrating both of these aspects across the entire firm, was a dominant characteristic among the five attributes of un-disruptability we identified. We found that, while the remaining four factors were critical on their own in important ways, they also reinforced ambidexterity by bringing talent, emotional timbre, focused attitudes, clear thinking, and sources of deep customer insight to bear on the question of how to achieve an organization that is ambidextrous across all areas.

Comfort with ambiguity and chaos is aligned with personality and temperament, but it is far from a hardwired characteristic. Many of the CEOs interviewed noted how they developed the dual view of exploration and exploitation over time and described how, as their comfort and competency with ambidexterity grew, they strove to use it as a strategic weapon.

2. CULTIVATE EMOTIONAL FORTITUDE

"You can't be afraid of risk. You have to take it while figuring out how to push it down, and how to insulate yourself if things bubble back to hurt you. I've just gotten used to taking risks every day. If it's the right decision, it's good, and if not, I simply pick myself up and say, 'OK, time to do something else.'"

—Construction-management CEO

CEOs need to display—and cultivate within their companies—an ability to use fear of the rapidly changing landscape to fuel more productive outcomes, and to accept failure is a risk when placing big bets. We call this *emotional fortitude*: the need for leaders to combine a sober assessment of potential risks and roadblocks with the fearlessness to pursue lofty visions. The CEOs we interviewed stressed the importance of being vision-driven in deed, not just by word.

Consider the former chairman and CEO of Hershey Foods, Richard Zimmerman, who created "The Exalted Order of the Extended Neck" award for employees who took well-considered risks and failed. Or FedEx's Fred Smith, who for decades has made heroes of employees who took reasoned risks in pursuit of greater customer service, whether the ideas worked or not. Symbolic moves such as these are culture-shaping rewards that convey the need for risky—but well-conceived—ideas that may or may not work. In this way, CEOs are modeling the way and encouraging others to follow.

The CEOs we spoke to indicated that emotional fortitude may very well be a powerful response to the innovator's dilemma. They have learned to lead in a chaotic world in part by *bringing chaos into the organization* and understanding fully that failure—on some level—is inevitable. To be clear, these leaders were not supporting "chaos" for the sake of chaos, but strongly advocating a culture where the possibility of failure is embraced.

This characteristic was behind some of the most emotional aspects of our interviews, and it challenged our qualitative data analysis. But as

we sought patterns, themes, relationships, and sequences, we "heard" these voices coming from the hearts of the CEOs (more so than from their heads), and this feature fell naturally into place.

When can one say a CEO is acting with emotional fortitude? It's when leaders:

- Have an open yet clear view of the world they face, with an equally clear vision about how they want to change it. They are focused on the future and unambiguous about their organization's **purpose.**
- Hold deeply internal, emotional convictions that are directly and consistently supported by words and actions. Since they walk their purpose-driven talk, **people are predisposed to trust them.**

"In the beginner's mind there are many possibilities, but in the expert's there are few."

- Take those difficult moments when things go wrong and acknowledge them with "grounded audacity." Symbolically leveraging such moments infuses the organization with **reasons for acting with urgency.**
- Find relative **comfort in making mistakes**. It is saying, "We've gotta try this," and conveying a sense of confidence in a certain direction while knowing full well that it could fail. Just as importantly, they are clear about when not to act. They show a disarming capacity to acknowledge what they do not know, accept that they may not be the smartest people in the room, and own up to their mistakes.
- Manage a healthy ego that supports one's personal legitimacy while respecting the value of other, even dissenting, opinions. They display relative comfort while under attack and exude a **sense of peace** when business feels more like war.

3. ENCOURAGE A BEGINNER'S MIND-SET

"Among some other CEOs I know, I'm struck by a few who are actually suppressed by their know-how. And they don't know how to understand the things they don't know. They automatically look at it and say 'we'll do it this way or that because that's how we do it.'"

—Technology CEO

The Zen Buddhism concept of Shoshin means "beginner's mind." In the words of Shunryu Suzuki, "In the beginner's mind there are many possibilities, but in the expert's there are few." This captures one challenge CEOs consistently raised: seeing the world from the perspective of someone who does not know much about it. It's not what's traditionally expected of them—nor what CEOs may expect of themselves. But rather than trying to be the "smartest" person in the room, our respondents repeatedly stressed the importance of having the "eyes" of someone who does not know everything. They found greater comfort and far better outcomes in asking questions and being genuinely inquisitive (even about things they *do* know).

Participants talked about listening more intently and considering what they hear with less judgment, and this included the way they asked new questions—asking out of true curiosity, avoiding the judgment that a question from a CEO may be perceived by many to bring. Most spoke also of the need to find patterns—to better understand not only the trees that stand in the forest, but also to become more curious about where the forest begins. "Questioning everything was something that always came easy to me, because I thought I knew the answers anyway," one said. "But some

important life experiences made me realize I didn't know it all. I had to *learn* to be curious, to express curiosity, to find a willingness to show that I do not know everything."

As we considered this concept, we were reminded of efforts taken by Salesforce CEO Marc Benioff[4] to remind his employees to stay nimble and not expect the current state of affairs to remain. "I respect the spirit of innovation," Benioff says. "Sometimes that spirit is going through me and sometimes it's going to come through someone else. . . . I try to cultivate a beginner's mind; I try to let go of all the other things that have ever happened so far in our industry (which is a lot of stuff) and go, 'Okay, what's going to happen right now?' and then I listen. Deeply listen. To myself, or really to others, or maybe great companies that I see, to the great innovators in the companies we bought, the organic innovators who have been in our company."

Benioff takes time off alone annually to consider profoundly new ideas—none of them based merely on iterative refinements of current products or elements of Salesforce's ecosystem or organizational strengths. He imagines disruptive ideas from whole cloth, many without organizational precedent, or the assumption of organizational readiness, or the need to be "merely" organizationally iterative.

Central to the notion of beginner's mind-set are the willingness and ability to replace the confidence that comes with experience with the curiosity that comes from naiveté. Benioff shares stories about an annual exercise where, far from the bustle of business, he dreams of unconstrained possibilities, records them in a journal, encourages others to do the same, and conducts sessions with them to share and discuss. The theme of beginner's mind-set often surfaced adjacent to the topic of talent and culture as CEOs saw those attitudes necessary not only in them but in everyone.

Finally, these CEOs understand that success depends on knowing what they do not know. They understand that they cannot rely on static pattern-recognition formulae to predict the future. We found a practicality and curiosity in the way they express doubt, ask questions, and examine their assumptions—a seemingly paradoxical dynamic in itself. In the end, it is this continual effort to understand organizational purpose—which both impacts and is impacted by the environment—that keeps the CEO vital.

4. MASTER DISRUPTIVE JUJITSU

"What I'm particularly good at is identifying patterns before other people can see them. The 'signal' I'm looking for is often a piece of discordant data that no one else is paying attention to. But once I spot it, that blip becomes my obsession."

—Global investment bank CEO

Remember when Blockbuster could have bought Netflix for $50 million and didn't? The rest is history: Not once, not twice, but three times Netflix has turned a disruptive threat into a competitive strength. The first time by renting videotapes and DVDs by mail and disrupting the brick-and-mortar model; the second time by leveraging streaming technology to cannibalize its own mail-based business; the third by recognizing the shift of value to content and deciding to invest in the creation of original content. And yet Netflix still hasn't won the war. Amazon and others are continually updating their own business models, and unless Netflix can

CEOs understand that success depends on knowing what they do not know.

keep seeing around corners to identify and harness the very forces that may disrupt it, it too faces risks.

Striving to become masters of disruptive jujitsu is precisely how CEOs aspire to handle disruption: recognizing threatening disruptions, breaking them into their components, selecting those components that can strengthen their organization, and then finding a way to "hijack" these disruptive elements for their own competitive advantage.

The need for earlier and more precise pattern recognition of exogenous forces was a prevailing theme among our respondents. The first step toward harnessing disruptive threats is to identify them. CEOs reported having a relentless focus on gathering and distilling information from the outside, both to model inquisitiveness to others as well as to quench their own thirst for dissonant data that may have important relevance. The fertile ground necessary for surfacing this data starts with the beginner's mind-set; it then becomes possible to harness the power of the patterns and find opportunities for hijacking one or more opportunities.

Equally important to our participating CEOs were their efforts to engage others in the task of prioritizing and interpreting what has become an abundance of discordant and disorganized information. They are Sherpas in the search for identifying the nature and direction of these forces, taking with them many other climbers seeking the path forward.

Yet disruptive jujitsu goes beyond just scanning for disruptions. The second half of threat-harnessing is finding ways to turn those threats to your advantage. Some banks, for example, are finding opportunities to use the advantage of size and the dominance of regulatory rules to their own benefit. One example is the emergence of the distributed database technology of blockchain, which, through the creation of broadly adopted, fully decentralized cryptocurrencies (such as bitcoin), has the potential to destroy a global money center's historical value proposition. Rather than trying to prevent the adoption of cryptocurrencies (as CEOs of incumbent competitors would likely have attempted to do in previous times), virtually all of the CEOs of today's established financial institutions are trying to work with the blockchain model, not against it. It's not quite what you may expect from large incumbents in a heavily regulated industry.

5. BECOME THE ULTIMATE END-USER ETHNOGRAPHER

"[A customer] now has the means to express opinions, register dissatisfaction, and demand seemingly impossible conveniences. Because of this, I see my customer as the primary source of disruption themselves. If I don't get inside her head, I'm dead."

—Apparel company CEO

It's no secret that companies need to focus on their customers. But CEOs in our interviews spoke of a desire to better understand not only customer needs and attitudes, but to gain insight into experience of the ultimate end user, becoming their most trusted champions by discovering their most subtle habits, desires, and subconscious concerns.

In the past decade, rapidly changing digital technology has empowered customers in entirely new ways. Today's customer is online, social, hyper-connected, and awash in product knowledge. This is not a bad thing. Obsessing over nuances of the entire customer experience is familiar to CEOs, and they expressed a need for much greater proficiency in achieving it. This means they are watching customers more closely—in new ways—as they are searching or sharing, trying or buying; and they are constantly striving to give customers what they want, quickly and effortlessly. It requires nothing short of an ethnography of the end-to-end customer experience, from the top of the marketing funnel to exceptional after-sales service.

Consider this example: Procter and Gamble (P&G), the owner of Crest, uses a third-party vendor to elicit selfies of people using its products. With thousands of images to mine, P&G gathers insights on consumer behavior that focus

groups and surveys cannot dream of gleaning. One discovery was an enormous spike in teeth brushing from 4 p.m. to 6 p.m., correlating to the time when members of the selfie-taking demographic are readying themselves for happy hour with fresh breath. This observation, and those like it, may impact decisions ranging from the time of day to launch social media campaigns to ways to reformulate products or develop new product extensions—as well as other important decisions around how to modify or market the product.[5]

Decades earlier at P&G, former CEO A. G. Lafley recalled when he first learned the power of seeing the world through the eyes of the end user. He was in the basements of customers who used P&G's Tide laundry detergent, asking women about the product's effectiveness, ease of use, and packaging. They responded favorably, but he noticed—by watching them—that not a single woman opened the box with her hand. Why? They told him they'd break a fingernail if they did. Instead, each customer had her own tool sitting on the shelf next to the box of Tide to create a gash of an opening into the cardboard: nail files, screwdrivers, or whatever was handy in the basement.

Customers took for granted the work-around they created and did not consciously think of it as a problem. The verbal and written feedback about packaging was consistently positive, and yet only by watching the customer did observers learn that it was not. As Lafley noted, someone from the company had to actually experience the product being used to actually understand that there was room for improvement. Customers, he believed, cannot always articulate what they want or do not want. There are times when only by watching them use the product can one fully understand the needs they may not be able to express.[6]

While machine learning and artificial intelligence hold distinct promise for a more granular view of the practices based on large populations of consumers, they are far from a complete solution to this challenge. The CEOs we interviewed tended to focus on the entire experience a customer has with their business. They are not only willing to fight the customer wars on multiple fronts—they are all but obsessed with it. Doing this requires an understanding of customer needs and reactions that go beyond the customer's consciousness.

Putting it all together

"Sure, the future is murky. I have to meet my quarterly numbers, understand the large picture of talent issues, make choices about what business we are in, try to shape regulation wherever I can. . . . We have to be on top of all of it, day in and day out."

—Chemical manufacturing CEO

Our conversations altered our view of the *Fortune* 250 CEO of the future, with implications for today. We acknowledge that, on some level, we subscribed to an exaggerated stereotype of the CEO characterized by rigidity, impenetrability, and a sense of all-knowing. This stereotypical CEO was analogous to the conductor of a symphony orchestra, seeking harmony among the body of performing players and adhering closely to a predetermined score. Our interviews with actual CEOs, however, suggest four alternative themes that have current and future implications:

First, we were influenced by *the strong desire CEOs have to infuse others with a high tolerance, if not passion, for ambiguity*. In this regard, they are trying not only to create organizations where others feel a relative comfort with chaos, but perhaps a mandate for them to go one step further. We were struck by the expectations they had of themselves to choreograph a perpetual flow of "micro-revolutions" from within. This notion is consistent with our colleague John Hagel's view of the "Big Shift," which is characterized by continuous, frequent, and unrelenting disruptions (for more, see the sidebar, "Placing disruption in perspective").

Second, the more accurate analogy for *what organizations need most from CEOs is a jazz bandleader rather than an orchestra conductor*. Leaders feel compelled to scale innovation, yet

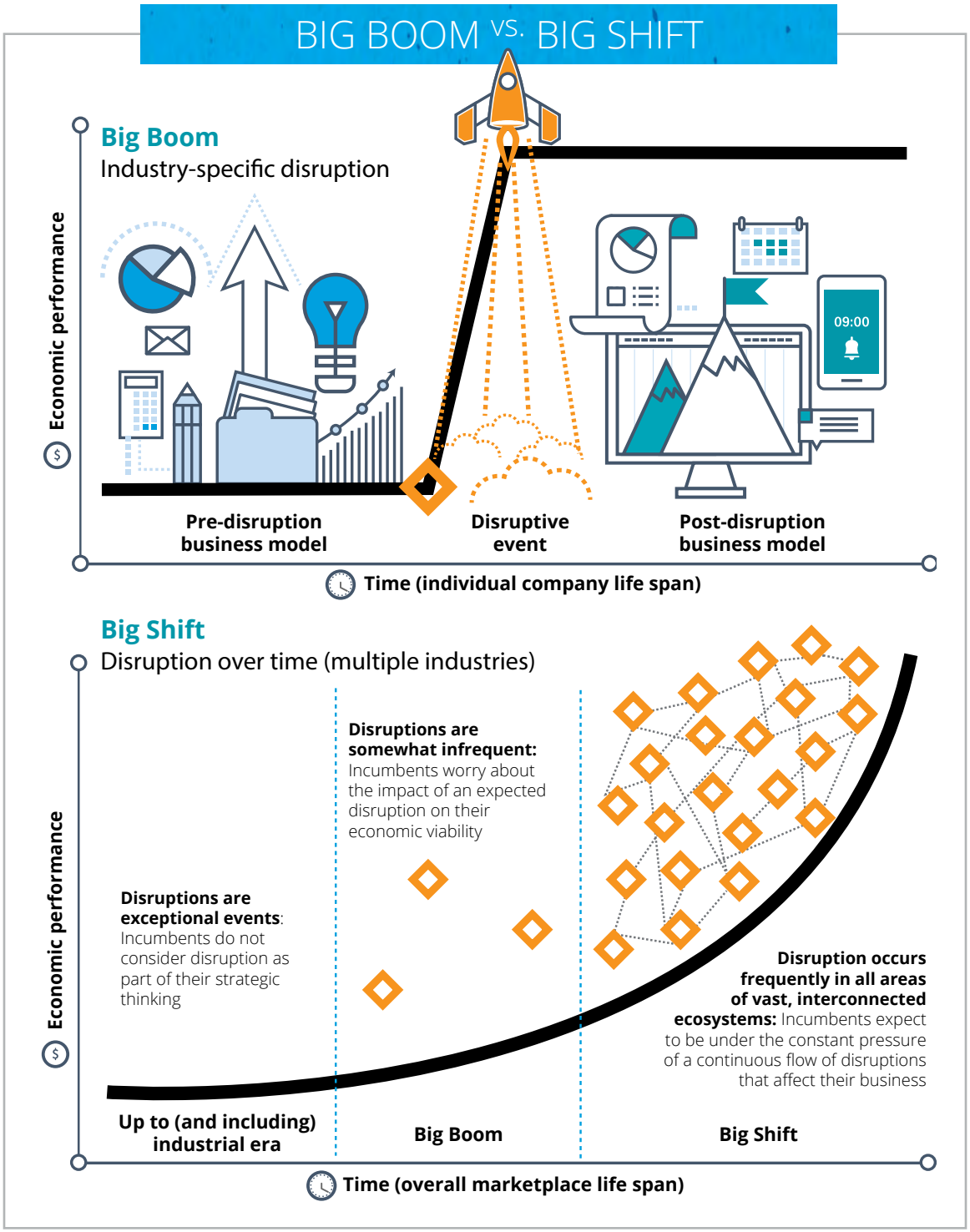
PLACING DISRUPTION IN PERSPECTIVE

Looking at the past 75 years of the business environment, we see three readily distinguishable periods:

The first, which we'll call "**Stability**," was characterized by enduring business models and continuous but slow evolutionary improvements in productivity. Industries experienced sharp bursts of innovation in underlying technologies and then relatively long periods of stability. For example, during the industrial revolution, the telephone and the internal combustion engine were technological leaps followed by relatively slow and incremental changes.

The second, which we'll call the "**Big Boom**," saw the widespread entrance of computing; business models of dominant incumbent players were made obsolete by increasingly frequent new entrants with different business models. Retail, for example, began to move online. The tailwind behind this phenomenon was the emergence of broadly explainable—but specifically unpredictable—shifts in technology. During the Big Boom, the pressure on CEOs is to focus on optimization, and the disruption, when it comes, is likely to catch the organization unprepared and result in its demise.

The third, for which our colleague John Hagel coined the term "**Big Shift**" in recognition of the rise of social business that ushered it in, is characterized by continuous, frequent, and unrelenting disruptions across all industries.[7] Enormous changes in digital infrastructure have brought greater productivity, transparency, and connectivity. These changes are then leveraged and combined to build diverse ecosystems, which, in turn, further reduce required capital investment. In this Big Shift era, the compounding effects of increasingly frequent radical disruptions occurring in multiple interconnected industries creates a performance curve that is more like a steep upward slope than a step.[8] In this new construct (figure 1), markets interact across all value-chain elements, buffeted by a continuous and escalating pace of change and the intensifying effects of multiple industries. Paradoxically, the Big Shift's increased frequency of disruption, by changing investor attitudes from an almost exclusive focus on optimization to an increased one on exploration and innovation, empowers CEOs to transform their organizations and enable them to survive and thrive through disruption.


BIG BOOM VS. BIG SHIFT
Big Boom
Industry-specific disruption
09:00
Economic performance
Pre-disruption business model
Disruptive event
Post-disruption business model
Time (individual company life span)
Big Shift
Disruption over time (multiple industries)
Disruptions are somewhat infrequent: Incumbents worry about the impact of an expected disruption on their economic viability
Disruptions are exceptional events: Incumbents do not consider disruption as part of their strategic thinking
Disruption occurs frequently in all areas of vast, interconnected ecosystems: Incumbents expect to be under the constant pressure of a continuous flow of disruptions that affect their business
Economic performance
Up to (and including) industrial era
Big Boom
Big Shift
Time (overall marketplace life span)

moderately frustrated that they cannot make it happen soon enough. What they are actually trying to create—in effect—is a new genre of the role. Unlike a symphony, the innovation that characterizes jazz requires something closer to a peer-to-peer mode more than an inflexible hierarchy. As bandleaders, they are pressing others, each with their own area of authority, to collaborate far more—something that rings true with the type of ambidexterity they discussed. Certainly, there is the need for a strong leader who is the ultimate arbitrator, but it may reflect more of what we now see in open-source communities than traditional corporations. They want to constantly reinvent their work and seek fresh, new approaches.

Our colleague Eamonn Kelly has expressed deep reservations about the slow evolution of the C-suite in the face of increasing rates of disruptions. Starting in the 1920s, C-suites accomplished the needs of firms to scale quickly and provide shareholders and regulators with greater accountability—what Kelly calls C-suite v1.0. The next evolution involved far greater functional specialization in the C-suite (v2.0), creating problems with the need to achieve coherence and alignment across multiple strategies. "Functional depth in the C-suite has come at a cost, particularly as organizations grapple to stay ahead of fast-moving, complex changes," Kelly says. "Organizations are complex systems with many elements interacting in a dynamic fashion. When external change takes place—for example, the emergence of a game-changing innovation, or a shift in the regulatory landscape—it rarely affects only one function inside the business. Rather, responding to changes typically requires many interdependent, mutually reinforcing strategic actions to take place across the enterprise."[9]

What's now needed, according to Kelly, is to move to v3.0 of the C-suite, which requires marrying the general management efficiencies of v1.0 with the functional expertise of v2.0. Under this approach, C-suite 3.0 would fully engage as part of a team, and help others in the C-suite achieve their goals.

Third, analysis of the data evokes both questions and possibilities. If these five factors are shown to become statistically significant causal variables to explain how CEOs lead through disruption, then *what are the most effective ways to develop these characteristics and behaviors?* At which inflection points in their careers do executives step out of their comfort zones to begin to develop one or more of them in earnest? What can we learn about ways to accelerate this development? Are younger generations, now being primed for organizational leadership roles, inclined to excel in these areas? More broadly, why are these factors so rarely practiced by CEOs today? What are the significant institutional pressures that keep CEOs locked into the old way of operating and how can these pressures be overcome by the CEOs themselves? Even more broadly, even if the CEOs succeed in adopting these factors, how do they overcome the powerful immune system in the broader organization that is still wedded to the old ways of doing things and aggressively resists any effort to change?

Finally, *the five attributes we identified lay the groundwork for a new and more nuanced leadership model.* Rather than five isolated factors, we increasingly see these characteristics as an organized whole, far more than the sum of their parts. The tide has turned from the belief that the CEO's role is to resolve conflicting challenges to assure stability in the organization.[10] On the contrary, if the role requires creating a steady stream of micro-revolutions, then it will likely require a broader way of thinking about the competencies needed for running large, complex organizations. The means for accomplishing this suggests a greater mastery of paradoxical elements within the newer, emerging role of the CEO, and the need for more adaptable organization designs to facilitate a steady stream of micro-revolutions. ●

BENJAMIN FINZI is the national co-managing director of the Deloitte CEO Program. The founder and former leader of Deloitte's New York Greenhouse, he has designed and facilitated hundreds of immersive "lab" experiences for CEOs and their leadership teams, where he combines principles of business strategy with behavioral science and design thinking to address clients' challenges.

MARK LIPTON is a graduate professor of management at The New School in New York and the author of *Guiding Growth: How Vision Keeps Companies on Course* (Harvard Business School Press, 2003). He is also a senior contributor of Deloitte's CEO Program eminence council.

VINCENT FIRTH is a managing director with Deloitte Consulting's US Strategy service line, Monitor Deloitte. As leader of Deloitte's CEO program, Firth works with leaders to build new strategic capabilities, redesign organizations, and develop, align, and implement strategy.

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CUSTOMER
CUSTOMER EXPERTISE
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SOCIAL
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DATA
PR
KPIs
DIGITAL
FINANCIALS
ANALYTICS
STRATEGIC ALLIANCES
KPIs
ANALYTICS
DATA
CUSTOMER EXPERTISE
CUSTOMER EXPERTISE
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Redefining the CMO

CHIEF MARKETING OFFICERS HAVE THE SHORTEST AVERAGE TENURE AMONG ALL C-SUITE ROLES. HERE'S HOW THEY CAN TAKE CONTROL OF THEIR FUTURE.

by Diana O'Brien, Jennifer Veenstra, and Timothy Murphy

ILLUSTRATION BY JOSIE PORTILLO

THE middle of the 19th century marked the dawn of the "physician scientist." But new ideas weren't always welcomed, as Dr. Ignaz Semmelweis learned when he declared: "Wash your hands." Semmelweis had been charged with analyzing the practices of two maternity wards, one managed by physicians, the other by midwives. He noticed a disturbing trend: The mortality rate of mothers in the physician-run ward was five times higher. After testing a number of hypotheses, Semmelweis came to a now obvious conclusion that the main reason was that physicians regularly conducted autopsies before overseeing deliveries—without first washing their hands.

Yet in 1846, roughly 14 years before germ theory began to develop in earnest, Semmelweis had no means of communicating why washing hands was vital to the mother's health. Unable to justify its importance, without the authority to enact policy, and hampered by poor communication skills (he

often berated physicians who did not heed his advice), Semmelweis was fired before he could enact a very simple yet life-saving change.

Marketing isn't a matter of life or death, at least not literally. But chief marketing officers are central to the success or failure of organizations, and here's where the parallels with Semmelweis resonate.[1] Just as he couldn't explain why washing hands mattered, CMOs often struggle to explain the linkage between marketing activities and financial performance. Just as Semmelweis had the important task of analyzing physician practices but lacked the authority to enforce policy, CMOs often sit at the executive table without the strategic empowerment their position demands. And just as Semmelweis didn't know how to build support among colleagues, many CMOs struggle to establish the kind of interdepartmental collaborations that can allow them to expand their influence—and value—beyond the marketing organization.

The net result is CMOs have the shortest average tenure among all C-suite roles, as they either lose their jobs due to perceived underperformance or become frustrated and move on.[2] Many organizations, for their part, suffer the opportunity cost of value not realized due to the CMO's difficulties in making a meaningful impact on activities across the enterprise. And that cost can be significant: One portfolio analysis shows that stocks of companies where a CMO is part of the top management team—often signaling a corporate-wide, customer-centric focus—netted shareholders significantly higher long-term returns than portfolios lacking CMO emphasis.[3] These results were magnified for organizations that had a relatively high R&D and advertising spend.

So why are many CMOs struggling? It's instructive to remember that in corporate terms, the CMO position is relatively new, really only emerging as a C-suite position in the 1980s. In the three decades since, marketing has fundamentally altered: Among other things, the relationship between marketers and agencies has evolved, technology has empowered consumers with more information at their disposal than ever, and the emergence of social media has sparked new channels for informing, winning, and losing customers (and reputations).

All of which raises the question: If everything that defines marketing has changed, is it time to redefine the CMO role itself?

A mismatch between expectations and reality

The good news is that many organizations see the need for CMOs to have an enterprise-wide role, less focused on pure tactics. One reason is the growing realization that, empowered by the information age, consumers are steadily gaining more power in the consumer-business relationship. For many organizations, push marketing is no longer sufficient. Instead, organizations are seeking out ways to engage customers with messaging that better speaks to their needs and values, establishing an ongoing relationship rather than a transactional one.

There's likely no one better placed to lead this customer-centric charge than the CMO. And many marketers *are* stepping up: A recent study by the CMO Council and Deloitte found that, over the past decade, CMOs have been increasingly asked to elevate their activities from brand and marketing plan management to acting as an enterprise-wide revenue driver that taps into the hearts and minds of their customers.[4]

But as with the early physician scientist, this new set of expectations can come with its share of ambiguity. While more CMOs are invited to have a seat at the strategic table, many are struggling to have their voices heard. To investigate why—and to identify ways CMOs might be able to empower themselves—we conducted over 40 structured interviews with a variety of C-suite executives, both within and outside the CMO role.

We found the CMO paradox largely intact: CMOs are expected to play an enterprise-minded role in organizations, but often don't have the authority and responsibility to be effective. Fully half of our interviewees said having an enterprise-wide mind-set was one of the most important

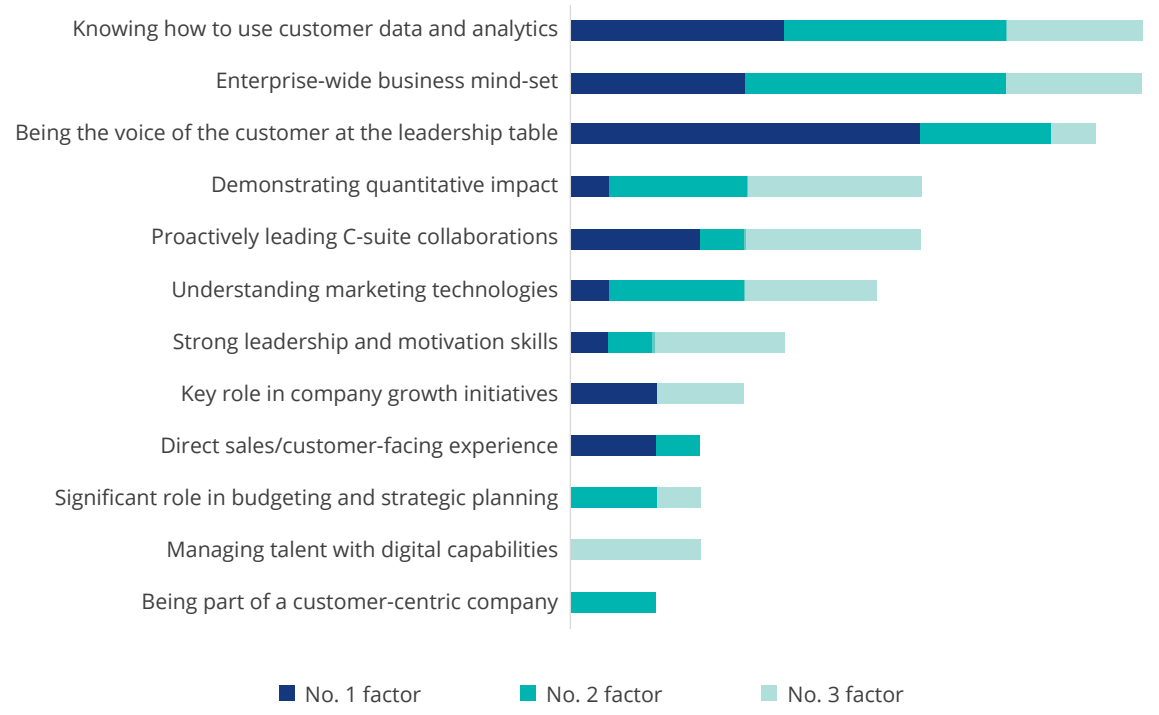
factors in a CMO's success. Yet a far smaller proportion thought it was important for CMOs to have a voice in company growth initiatives, own a significant role in budgeting and strategic planning, or be part of a customer-centric company—all factors that typically come with having an enterprise-wide mind-set (see figure). Instead, many CMOs seem relegated to more tactical areas. While more than 40 percent of CMOs in our study said they were working on brand-shaping and campaign execution activities, our study found only 6 percent of CMOs said they were actively working on growing revenue across all global business activities.[5]

To this point, we've often simplified the CMO's role to brand and campaign execution. What's typically lost in that simplification is the burden of tactical overload. As more tools and techniques have entered the marketer's arsenal in recent years, many CMOs have seen myriad responsibilities added to their plate, from the execution of social media campaigns to market research, digital marketing, direct marketing, advertising, and public relations. With brand and marketing plans at the foundation, many of these new responsibilities have been treated as operational: tactical add-ons rather than a justification for elevating CMOs to strategic partners. In today's customer-centric environment, it's easy to simply view every task as customer-related and, therefore, the CMO's responsibility. This carries the risk not only of overloading the CMO with tasks (minus the strategic empowerment) but of turning the CMO into "the jack of all trades and perhaps the master of none."[6]

Helping CMOs help themselves

Our findings underlined the potential need for the CMO to be redefined. After all, they made it clear that most senior executives themselves see the need for CMOs to adopt an enterprise-wide mind-set and

FIGURE 1 | Top three factors driving CMO success



role. Yet actually making that change can be hard, and we believe it's a two-step process. First, CMOs should leverage the resources they have to make key changes in the way they interact with other functions (and with the CEO) that can deliver tangible results. This, in turn, will help bolster their case for more authority, responsibility, and resources to consolidate their position and help them execute even more effectively.

Where should CMOs start? Based on our research, three areas stand out:

1. **Relentlessly pursue customer expertise.** By positioning themselves as customer experts—and bringing the benefits of that expertise to other functions in the organization—CMOs can trade tactical responsibilities for enterprise-wide strategic influence.
2. **Make marketing make sense.** CMOs can make their voice heard by translating marketing insights into the language of their C-suite peers, be it financial, strategic, sales-oriented, or talent-related.
3. **Establish a "center-brain" mentality.** Much has been said about the increasing need for strong data-analytics capabilities in marketing, and rightly so. Yet this should not tempt CMOs to undervalue the creative, right-brain skills that marketers have more traditionally valued. Only by marrying the two can CMOs bring insight and actionable guidance to organizations, and it requires a forward-thinking, strategic mind-set.

RELENTLESSLY PURSUE CUSTOMER EXPERTISE

"The most critical capability of the CMO is to have a profound, deep understanding of customers and their needs and know how to engage with and serve them. This of course involves knowledge of data and analytics."

– Jamie Moldafsky, CMO, Wells Fargo

If the customer sits at the center of the organization, then so should marketing—in fact as well as in expectation. Fortunately, this is where CMOs typically have the means to excel. CMOs wishing to transform their role can take advantage of their unique position to elevate themselves as *the* customer expert with stakeholders across the enterprise. And the more fragmented the organization, often the greater the organization's need—and the CMO's opportunity. "The bigger an organization gets, the more silos it has, and the less people have an overarching view of the customer," BMW Group's vice president of digital business and customer experience says. "The most important role marketing can play is to be the voice of the customer, walk in their shoes, and bring that to the rest of the organization."

To do this, two things can be important:

- **Understand the whole customer journey.** Many marketing organizations already collect vast amounts of data. How can CMOs use that data to understand their customers well enough to inform a differentiated, customer-centric approach—not only for marketing but for the rest of the enterprise? Many might say that analytics is the answer, but they're likely only partly right. The real value that marketing can bring to the broader organization is data-driven insight.

  Many marketers already understand that, with the right data-gathering tools and analytics, an organization can use the digital breadcrumbs that customers leave behind to piece together a holistic picture of their experience. Some refer to this process as customer value analytics (CVA):[7] bringing together an eclectic set of data (mobile, social, customer attitude metrics such as net promotor score, and even sensor technologies) to map the customer journey from acquisition through retention. The additional step CMOs should take is to recognize that the customer journey involves touch points with parts of the organization *owned by functions other than marketing*—and put their analytical tools to work to uncover what those functions can do to make those touch points satisfying customer experiences.

  Unfortunately, while data and technology are generally improving the CMO's understanding of the customer, too often they are not applying

these newfound insights on a grander scale. The CMO Council and Deloitte survey shows that while more marketers are being armed with greater customer insights and technical reach, they are not broadening their applications in kind.[8] Instead, they are doubling down on brand and campaign-centric efforts. For example, while 34 percent of CMOs said they are applying these capabilities toward campaign management platforms, only 10 percent said they are using them to improve life cycle management or customer experience management platforms. Potentially worse, too much focus on new capabilities without direct tie-ins to broader organization initiatives can signal to the CMO's peers that they are not operating on a strategic level.[9] To combat this, CMOs should consider each new insight or capability gained as an opportunity to expand the customer reach throughout the organization.

> If the customer sits at the center of the organization, then so should marketing—in fact as well as in expectation.

- **Execute strategy through organizational partnerships.** With analytical insights in hand, CMOs can have the ammunition to approach other organizational leaders to build a better end-to-end customer experience. After all, regardless of where other functions' responsibilities fall, a customer angle most likely exists.

  Making these connections and sharing in the success of a common goal can organically forge a partnership. As one chief human resources officer (CHRO) we interviewed explains, "The CMO needs to be a part of the strategic planning process. If the customer isn't built through the business strategy then you don't have a strategy." CMOs can do their part to ensure that the customer is deeply engrained in the strategy by kindling organization-wide partnerships.

  For example, when an analysis of marketing data showed customers of used-car retailer CarMax preferred to hone in on vehicle choices using interactive online tools rather than by inspecting car lots, its CMO worked with the chief information officer (CIO) to design a digital experience that would not only allow customers to do so but offer them a more satisfying experience overall.[10] Some of these changes to the website included a more in-depth vehicle recommendation tool, the addition of reliability and safety ratings, and the ability for consumers to set up customized email alerts based on price changes or new listings that match preselected criteria.[11]

  And these insights do not need to be limited to matters of technological improvement. Instead, CMOs armed with customer insights can use this new clout to advance strategic initiatives across the entire organization—from frontline sales all the way up to the boardroom. After all, who should know more about gaining share of customer than the customer expert?

MAKE MARKETING MAKE SENSE

"To make sure that a CMO has credibility, they have to be able to know how to talk to other members of the C-suite. CMOs must be comfortable talking to the CFO about P&L and to the CIO about technology needs."

– Financial services CMO

Insights and partnerships are necessary but not always sufficient. In order to form a partnership in the first place, marketing leaders should speak the language of their peers across the C-suite, translating marketing concepts and insights into terms that align them with other stakeholders' objectives. Marketing leaders who can do this effectively are better primed to contribute to organization-wide

long- and short-term objectives, as well as to secure the support of the top management team.

A deeper understanding of the customer does not mean a narrower runway. In fact, businesses with highly influential marketing departments have consistently achieved higher short-term returns on assets and long-term shareholder value than those with relatively weaker groups. (For more, see the sidebar "CEO considerations: Balancing the long with the short.")[12]

But to become influential, CMOs may need to position their customer insights and goals not as marketing objectives per se but as ways to help their C-suite colleagues reach their own goals. For instance, instead of declaring, "Doing X will help your function improve the customer experience," a CMO could tell the top sales executive that "Doing X will help increase sales volume because customers will want more of our product," the chief financial officer (CFO) that "Doing X will help raise revenue because customers will be buying in greater volume," and the CEO that "Doing X will help consolidate our lead in market share because customers will choose us over the competition." The CMO's goal is to explain in the clearest possible terms how the marketing goal supports his or her peers with *their* objectives, which can be a much more compelling proposition.

Our research points to sales and finance as two especially important "languages" for CMOs to speak. "The biggest challenge CMOs have is working with sales," one former CEO said. "Salespeople will often say 'Marketing doesn't know the first thing about the customer.'" The reality is it may be less that

CEO CONSIDERATIONS: BALANCING THE LONG WITH THE SHORT

CEOs often seek results in the near term from their marketing investments. This can be at odds with marketers who insist that brand equity and customer relationships are long-term endeavors that can take years to groom before realizing cash flows. What should the CEO's expectations be?

Through a multiyear investigation, the *Journal of Marketing* provided insights into the long- and short-term relationships of marketing investments.[13] Analysis of data collected over 15 years in publicly held companies showed how marketing expenditure on long-term initiatives—such as brand equity and customer relationship building—influenced shareholder value and how short-term initiatives—such as promotional activities—impacted return on assets (ROA) performance.

Marketing departments forced to make long- and short-term trade-offs saw similar organization-wide financial results. Organizations that prioritize short-term profitability more often achieve a higher ROA but at the expense of long-term shareholder value. Conversely, organizations that invest in customers and brand for the long term increase shareholder value but a short-term dip in ROA. It seems investing in the long and short term is a careful balancing act, with leaning too far one way coming at a price.

This analysis offers a word of caution for CEOs: Aggressively chasing short-term rewards can exhaust long-term marketing assets. At Amazon, immediately after highlighting a "relentless" focus on the customer in its corporate governance message, this long-term mantra is reinforced: "Make bold investment decisions in light of long-term leadership considerations rather than short-term profitability considerations."[14]

The research also found a mitigating third scenario: Exceptionally powerful marketing departments (measured by marketing investment relative to peer groups) can reduce the magnitude of these trade-offs.

marketing doesn't know the customer, and more that it has not applied its insights more globally. This only underlines the need to establish customer credibility and the importance of marketers understanding the sales process and demonstrating an ability to apply their customer expertise to the sales group's goals. They should, first, reach out to sales to understand its processes and, second, help ensure their teams have individuals with sales experience.

Similarly, if the CMO cannot connect customer initiatives to financial outputs such as operating margin and shareholder value—the *lingua franca* of the CFO and the CEO—the CMO's agenda may risk falling on deaf ears. Especially if a CEO empowers a CMO with revenue accountability, CMOs need to assure the board that marketing budgets do not become a black box activity. Without concrete analysis, trust erodes.

Translating marketing activities into a financial language is often no easy feat. It can require careful thought, planning, and once again, organizational collaborations. For example, brewer MillerCoors' CMO and CFO dedicate an entire executive role to helping marketing and finance communicate—senior director, marketing finance.[15] This position reports to the CFO with a dotted line to the CMO, sitting on both the senior finance and marketing teams. The result? Analysts on the marketing finance team became so deeply ingrained in marketing—and tying their efforts to financial metrics and goals through data and analytics—that they are considered "mini-CFOs" of their individual marketing responsibilities. Though organizational goals may differ, this kind of collaborative approach is a replicable process that marries unique skill sets across the organization to accomplish shared objectives.

ESTABLISH A "CENTER-BRAIN" MENTALITY

"Surround yourself with people who are better than you are. Don't try to do everything. Build a team with the best skills who have both technical skills and strategic mind-set. At the end of the day, it's about talent. Without a great team, you won't be successful."

- Stephane Gonthier, former president and CEO, 99 Cents Only Stores

Marketing has historically been approached as a predominantly right-brained, creative function, and many marketers pride themselves on their intuitive feel for the marketplace. But with the rise of analytics' importance, some CMOs may be tempted to focus on numbers and data at the expense of these more traditional skills. We would caution that the pendulum should not swing too far the other way. We do not want to completely wash away the emotional connection that marketers cultivate in favor of a left-brained, mechanical marketing function. The challenge and opportunity for CMOs is to cultivate a data-driven mind-set, both personally

If the CMO cannot connect customer initiatives to financial outputs such as operating margin and shareholder value—the *lingua franca* of the CFO and the CEO—the CMO's agenda may be at risk of falling on deaf ears.

and within their team, without losing that creative spark.

CMOs can take several steps to manage a marketing team that can allow a wide range of expertise and opinions to flourish. A good starting point can be to take an inventory of the skills within the marketing organization. When Visa's new CMO took over, for example, she assessed the strengths and opportunities of her own team across a number of categories relevant to the goals and objectives of her department.[16] This can allow a CMO to identify where gaps may exist and point toward ways to address them—whether through hiring, development, and/or strategic partnerships with other departments.

Another important step is to enable synergies between the quantitative and the qualitative. For many organizations, this could mean deliberately teaming people with technical and analytical skills with those who have traditional marketing abilities. The goal is to allow people to learn each other's language and draw on each other's strengths when solving marketing challenges.

The challenge and opportunity for CMOs is to cultivate a data-driven mind-set, both personally and within their team, without losing that creative spark.

It's critical, too, to cultivate an environment where a diverse set of opinions can be expressed and applied to CMO initiatives. Work to make sure these new, sometimes conflicting points of view have space to grow. After the Bay of Pigs incident in 1961, US President John F. Kennedy learned some on his staff had quiet reservations but felt the need to censor their opinions.[17] As a result, Kennedy appointed his brother to act as the devil's advocate to give room for other ideas to flourish.

How CMOs can help reset their role

RELENTLESSLY PURSUE CUSTOMER EXPERIENCE

- Leverage digital breadcrumbs to paint the full customer picture
- Form strategic alliances to ingrain customer insights across the organization

MAKE MARKETING MAKE SENSE

- Work with financial teams to align marketing activities with key performance indicators (KPIs)
- Broaden marketing scope beyond traditional campaigns

ESTABLISH A CENTER-BRAIN MENTALITY

- Take an inventory of current skill sets to identify strengths and gaps
- Create room for a diverse set of capabilities and opinions to flourish

Time to reboot

On the one hand, it can be argued CMOs have been set up for failure. A paucity of direction, communication, or strategic empowerment to bring about change has led to their role definition not only often being ambiguous but in a state of constant flux. In addition, a focus on the tactical details of the marketing function itself can act as a hurdle to CMOs having an enterprise-wide vision, despite that being expected of them.

The good news is we're confident that this need not be the permanent state of things. By using customer analytics and organizational partnerships, by communicating clearly with the C-suite, and by skillfully melding the right brain and left brain aspects of their role, CMOs can take charge of customer insights to not only justify their seat at the board table but to become the strategic counsel their responsibilities and knowledge demands. The nature of marketing has changed. It's time to reboot the CMO role.

DIANA O'BRIEN is the CMO of Deloitte US.

JENNIFER VEENSTRA is a director with Deloitte Consulting in San Francisco, California, and leads Deloitte's CMO program.

TIMOTHY MURPHY is a researcher with Deloitte's Center for Integrated Research.

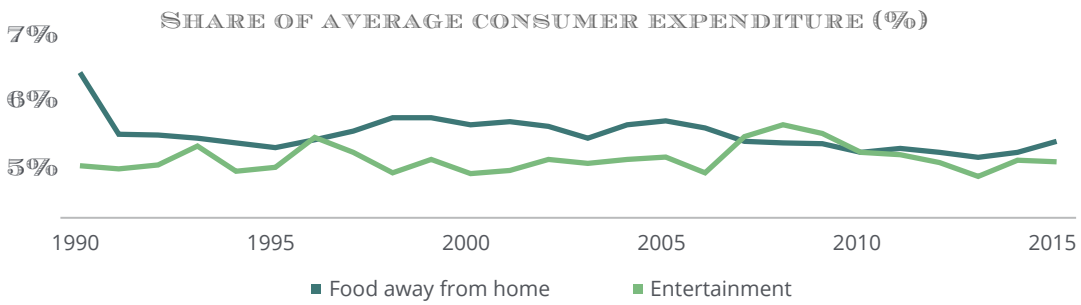
AMERICA'S CONSUMER SPENDING MYSTERY

IT'S OFTEN SAID that when the American economy sneezes, the world catches a cold. So it's no wonder that headlines such as "*Shoppers are choosing experiences over stuff, and that's bad news for retailers*"[1] are worrisome for all players in the planet's biggest consumer market. While brick-and-mortar stores have been battling the rise of online shopping for years,[2] a broader shift in how Americans spend could affect everyone—e-commerce included. And often when looking for someone to blame, it's popular to target consumers like Millennials, for example, who are often perceived as eschewing materialism to live in the moment.

But are they really rushing to buy experiences, not products? One of the leading measures of spending in the United States, the Survey of Consumer Expenditure, shows average consumer expenditure has been growing at a healthy pace since the recession, with the latest data showing an increase of 4.6 percent in 2015.[3] Yet when we look at the main spending categories—housing, groceries, apparel, and automobiles—their share of average consumer expenditure has indeed declined over time. So that must mean people have shifted to investing in experiences, right? Not quite.

A look at the main categories considered "experiences" (such as travel, entertainment, dining out, and recreation) indicates that while Americans have increased their spending or remained static of late, they still lag the average of the previous decade (see figure). Similarly, there's no incriminating evidence to suggest Millennials are driving a shift to experiences—all age groups more or less indicate similar spending patterns. All of which means that, while spending isn't increasing on products, it hasn't shifted to experiences either.

AMERICANS AREN'T SPENDING RELATIVELY MORE ON EXPERIENCES



Source: Survey of Consumer Expenditure; Haver Analytics; Deloitte analysis.

So just how are Americans spending their money? On costs related to *health care* and *insurance and pensions*.[4] Those categories are likely driving consumers of all ages away from traditionally strong retail segments. The reasons vary—from higher out-of-pocket spending on health care to the aging of the US population and the impact of the financial crisis on retirement accounts. But the bottom line is that Millennials are off the hook. The shift in household spending patterns really isn't too much of a mystery: Americans are just meeting the age-old need to pay for health care and life after work.

Take a closer look at US consumer spending patterns in *The consumer rush to "experience": Truth or fallacy?* on deloitte.com/insights.

THE DIVERSITY & INCLUSION *REVOLUTION*

EIGHT POWERFUL TRUTHS

by Juliet Bourke and Bernadette Dillon

IN 2013, QANTAS posted a record loss of AUD$2.8 billion.[1] This low point in the airline's 98-year history followed record-high fuel costs, the grounding of its A380s in 2010 for engine trouble, and the suspension of its entire fleet for three days in 2011 after a series of bitter union disputes. Across the country, predictions surrounding the fate of Australia's national carrier were dire.

Fast-forward to 2017, and the situation couldn't be more different.[2] Qantas delivered a record profit of AUD$850 million,[3] increased its operating margin to 12 percent,[4] won the "World's Safest Airline" award,[5] ranked as Australia's most trusted big business[6] and its most attractive employer,[7] and delivered shareholder returns in the top quartile of its global airline peers and the ASX100.[8]

Transformation is an overused word, but for Qantas it's a perfect description. How did it happen? The company's 2017 Investor Roadshow briefing sounded like a textbook in disciplined operational and financial management, as well as employee, customer, and shareholder focus. Yet for CEO Alan Joyce, the spectacular turnaround reflects an underlying condition: "We have a very diverse environment *and* a very inclusive culture."[9] Those characteristics, according to Joyce, "got us through the tough times[10] . . . diversity generated better strategy, better risk management, better debates, [and] better outcomes."[11]

Joyce's insight reflects a growing recognition of how critical diversity and inclusion (D&I) is to business performance. Indeed, two-thirds of the 10,000 leaders surveyed as part of Deloitte's 2017 *Global Human Capital Trends* report cited diversity and inclusion as "important" or "very important" to business.[12] Despite this, overt attributions such as Joyce's are scarce. Rarely does diversity and inclusion feature so centrally in a CEO's story of success. The challenge lies in translating a nod of the head to the value of diversity and inclusion into impactful actions—and that necessitates a courageous conversation about approaches to date.

To accelerate that conversation, this document presents eight powerful truths about diversity and inclusion. It is the culmination of our work with approximately 50 organizations around the world, representing a footprint of more than 1 million employees. In this article, we draw upon the findings of seven major research studies that cut into new ground, covering topics such as diversity of thinking, inclusive leadership, and customer diversity.[13] Our aim is to inspire leaders with possibilities and to close the gap between aspiration and reality.

THE EIGHT POWERFUL TRUTHS

1. DIVERSITY OF THINKING IS THE NEW FRONTIER

2. DIVERSITY WITHOUT INCLUSION IS NOT ENOUGH

3. INCLUSIVE LEADERS CAST A LONG SHADOW

4. MIDDLE MANAGERS MATTER

5. REWIRE THE SYSTEM TO REWIRE BEHAVIORS

6. TANGIBLE GOALS MAKE AMBITIONS REAL

7. MATCH THE INSIDE AND THE OUTSIDE

8. PERFORM A CULTURE RESET, NOT A TICK-THE-BOX PROGRAM

1. Diversity of thinking is the new frontier

"The most innovative company must also be the most diverse," says Apple Inc.[14] "We take a holistic view of diversity that looks beyond usual measurements. A view that includes the varied perspectives of our employees as well as app developers, suppliers, and anyone who aspires to a future in tech. Because we know new ideas come from diverse ways of seeing things."[15]

Apple's insight lines up with Joyce's. It's about looking beyond demographic parity to the ultimate outcome—diversity of thinking.

This is not to say that demographic characteristics, such as gender and race, are not important areas of focus. Organizations still need to ensure that workplaces are free from discrimination and enable people to reach their full potential.

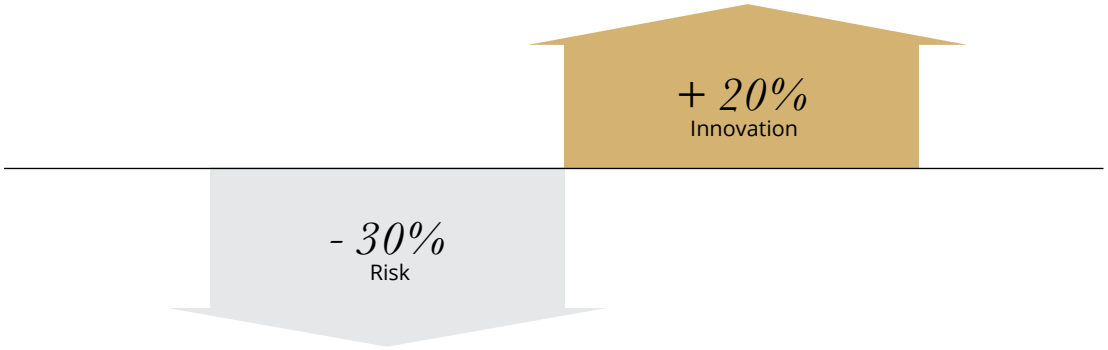
But there is a horizon beyond this.

Our view is that the goal is to create workplaces that leverage diversity of thinking. Why? Because research shows that diversity of thinking is a wellspring of creativity, enhancing innovation by about 20 percent. It also enables groups to spot risks, reducing these by up to 30 percent. And it smooths the implementation of decisions by creating buy-in and trust (figure 1).[16]

So how can leaders make this insight practical, and not neglect demographic diversity?

The answer lies in keeping an eye on both. Deloitte's research reveals that high-performing teams are both cognitively *and* demographically diverse. By cognitive diversity, we are referring to educational and functional diversity, as well as diversity in the mental frameworks that people use to solve problems. A complex problem typically requires input from six different mental frameworks or "approaches": evidence, options, outcomes, people, process, and risk. In reality, no one is equally good at all six; hence, the need for complementary team members.[17] Demographic diversity, for its part, helps teams tap into knowledge and networks specific to a particular demographic group. More broadly, it can help elicit cognitive diversity through

FIGURE 1 | The value of diversity of thinking



Source: Juliet Bourke, *Which Two Heads Are Better Than One? How Diverse Teams Create Breakthrough Ideas and Make Smarter Decisions* (Australian Institute of Company Directors, 2016).

its indirect effect on personal behaviors and group dynamics: For example, racial diversity stimulates curiosity, and gender balance facilitates conversational turn-taking.[18]

Diversity of thinking is powerful for three reasons. First, it helps create a stronger and broader narrative about the case for diversity, one in which *everyone* feels relevant and part of a shared goal. Second, it more accurately reflects people's intersectional complexity instead of focusing on only one specific aspect of social or demographic identity.[19] Third, a focus on cognitive diversity recognizes that demographic equality—rather than being its own end—is most useful as a visible indicator of progression toward diversity of thinking.

The truth is, optimal diversity of thinking cannot be achieved without a level playing field for all talent, and clearly there is still work to be done on that front.

2. Diversity without inclusion is not enough

Deloitte's research identifies a very basic formula: *Diversity + inclusion = better business outcomes*. Simply put, diversity without inclusion is worth less than when the two are combined (figure 2).[20]

This insight is gaining traction, helping to position diversity and inclusion as separate concepts

FIGURE 2 | The case for an inclusive culture

Organizations with inclusive cultures are:

2x
as likely to meet or exceed financial targets

3x
as likely to be high-performing

6x
more likely to be innovative and agile

8x
more likely to achieve better business outcomes

Source: Juliet Bourke, *Which Two Heads Are Better Than One? How Diverse Teams Create Breakthrough Ideas and Make Smarter Decisions* (Australian Institute of Company Directors, 2016).

At its highest point, inclusion is expressed as feeling "confident and inspired."

with equal importance. But there's a problem. The definition of "inclusion" is often left to personal interpretation, and many organizations seem unclear about what it means. Without a shared understanding of inclusion, people are prone to miscommunication, progress cannot be reliably evaluated, leaders can't be held accountable, and organizations default to counting diversity numbers.

What does inclusion really mean? Deloitte's research reveals that a holistic definition comprises four related yet discrete elements (figure 3).

First, people feel included when they are treated "equitably and with respect." Participation without favoritism is the starting point for inclusion, and this requires attention to nondiscrimination and basic courtesy.

The next element relates to "feeling valued and belonging." Inclusion is experienced when people believe that their unique and authentic self is valued by others, while at the same time have a sense of connectedness or belonging to a group.

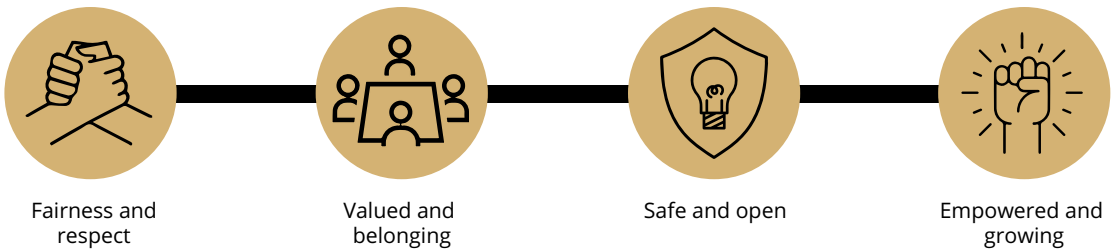
At its highest point, inclusion is expressed as feeling "safe" to speak up without fear of embarrassment or retaliation, *and* when people feel "empowered" to grow and do one's best work. Clearly, these elements are critical for diversity of thinking to emerge.[21]

The truth is that only when organizations are clear about the objective can they turn their attention to the drivers of inclusion, take action, and measure results.

3. Inclusive leaders cast a long shadow

Deloitte's research shows that the behaviors of leaders (be they senior executives or managers) can drive up to 70 percentage points of difference between the proportion of employees who feel highly included and the proportion of those who do not.[22] This effect is even stronger for minority group members.[23] Furthermore, an increase in individuals' feelings of inclusion translates into an increase in perceived team performance (+17 percent), decision-making quality (+20 percent), and collaboration (+29 percent) (figure 4).[24] Pause for a second to let those numbers sink in. This phenomenal difference reflects the power of a leader's shadow.

FIGURE 3 | The science of inclusion: Deloitte's inclusion model



Sources: Bersin by Deloitte, *High-impact diversity and inclusion: The new maturity model*, 2017; Juliet Bourke and Bernadette Dillon, *Waiter, is that inclusion in my soup? A new recipe to improve business performance*, Deloitte Australia and the Victorian Equal Opportunity and Human Rights Commission, 2012.

FIGURE 4 | Inclusive leadership and team performance

Source: Based on Deloitte Australia's analysis of 105 leaders as assessed by 600 raters against the six signature traits of inclusive leadership and perceived performance outcomes.

What distinguishes highly inclusive leaders from their counterparts? Deloitte's research identifies six signature traits, all of which are interrelated and mutually reinforcing (figure 5):[25]

1. *Commitment*: They are deeply committed to diversity and inclusion because it aligns with their personal values, and they believe in the business case for diversity and inclusion. They articulate their commitment authentically, bravely challenge the status quo, and take personal responsibility for change.
2. *Courage*: They are humble about their own capabilities and invite contributions by others.
3. *Cognizance of bias*: They are conscious of their own blind spots as well as flaws in the system, and work hard to ensure opportunities for others.
4. *Curiosity*: They have an open mind-set; they are deeply curious about others, listen without judgment, and seek to understand.
5. *Culturally intelligent*: They are attentive to others' cultures and adapt as required.
6. *Collaboration*: They empower others and create the conditions, such as team cohesion, for diversity of thinking to flourish.

Clearly, these traits are much more than just being "nice" to people, or even just being aware of unconscious biases. Our view is that inclusive leadership is broader and a much more intentional and effortful process. In essence, inclusion of diversity means adaptation. Leaders must alter their behaviors and the surrounding workplace to suit the needs of diverse talent, ideas, customers, and markets.

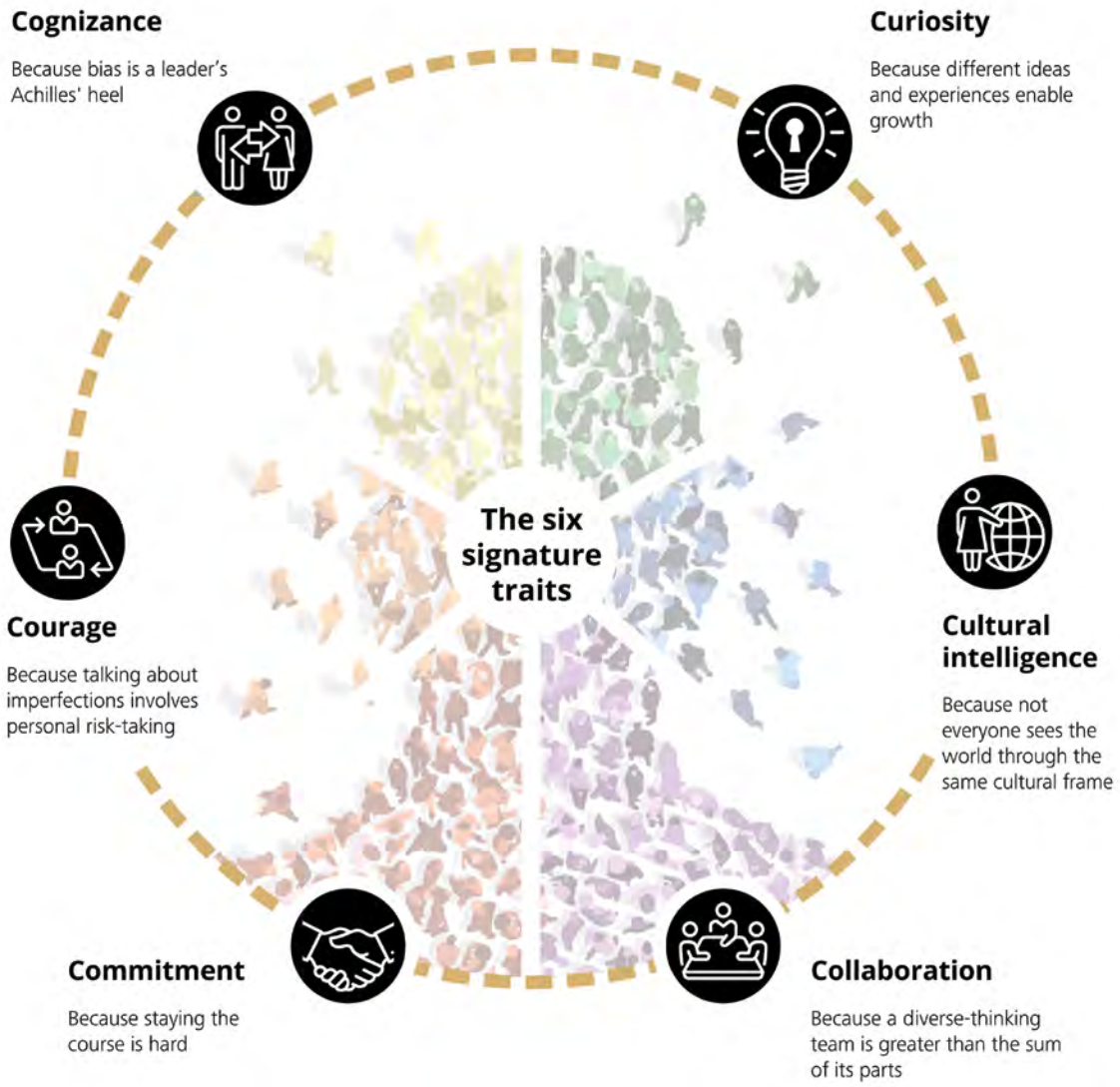
The truth is, the rules of the game have changed, and the old "hero" style of leadership is . . . old. As the context has become much more diverse, inclusive leadership is now critical to success.

4. Middle managers matter

"Ah, the middle managers conundrum," the authors of a 2007 research paper wrote. "The grassroots are energized, the executives have seen the light, and the top-down and bottom-up momentum comes to a screeching halt right in the middle girth of most organizations."[26]

This may sound harsh, but in the context of diversity and inclusion, middle management is a historically underserviced group. While many executives have been afforded time to learn, reflect, and debate, mid-level managers are often given directives. A change-management process that leaves questions unaddressed results in managers feeling unable to move forward.

FIGURE 5 | The six signature traits of an inclusive leader



To say this is problematic is an understatement. While change needs to be driven from the top, the middle manager cohort is vital to the success of an organization's diversity and inclusion strategy. As Jonathan Byrne of MIT observes, "Regardless of what high-potential initiative the CEO chooses for the company, the middle management team's performance will determine whether it is a success or a failure."[27]

Clearly, organizations should engage middle managers. But when they do, they should also stop treating middle managers as if they are a single mass. Deloitte's research identified six distinct archetypes, or "personas," that individuals tasked with implementing change need to engage with and understand. These personas range from those who are deeply committed to those who can act as saboteurs (figure 6). Against that backdrop, one size will

not fit all with respect to the way that information is delivered, experiences shaped, and boundaries set.

Senior leaders can influence middle managers in a variety of ways, including:

1. Using storytelling to help move people emotionally and engage them on the purpose of the D&I agenda. For example, senior leaders could share their personal stories of commitment.
2. Addressing myths and misconceptions by ensuring that middle managers understand the fundamentals—for example, by communicating the difference between equality and equity (figure 7).[28]
3. Having open conversations to enable questions and concerns to be surfaced. Senior leaders should enter these conversations with curiosity and courage—two of the trademark characteristics of highly inclusive leaders.
4. Exposing middle managers to influential role models and other powerful experiences, such as putting them on high-performing, diverse teams; presenting them with counter-stereotypic examples; offering them mentoring opportunities; and giving them experiences that put them in the minority. These tactics should help managers walk in someone else's shoes and enable perspective-taking.
5. Making tough decisions when needed to ensure that the organizations' values are upheld. Inclusion is not a euphemism for "anything goes."

5. Rewire the system to rewire behaviors

Training is the most popular solution to increase workforce diversity. Research shows that nearly one-half of the midsize companies in the United States mandate diversity training, as do nearly all the *Fortune* 500.[29] Not surprisingly, the effectiveness of diversity training has come under scrutiny, with some claiming a positive impact (increased diversity representation), while others are dismissive (citing backlash and even activation of stereotypes).

Diversity training programs come in many shapes and sizes: educational vs. experiential, voluntary vs. mandatory, inspirational vs. shaming. At its best (voluntary, experiential, inspiring, and practical), training raises awareness, surfaces previously unspoken beliefs, and creates a shared language to discuss diversity and inclusion on a day-to-day basis. These objectives are a positive and important first step in the change journey.

FIGURE 6 | Deloitte's six personas of strategic change as applied to diversity and inclusion

Opposed	Unaware	Undecided: Anxious	Undecided: Fatigued	Supportive	Committed
A saboteur, deliberately undermining diversity and inclusion goals through words and actions	Concerned about how diversity and inclusion may impact him/her or colleagues	In the dark about diversity and inclusion, either because he/she has never read or heard about it or doesn't remember it	Once fired up about diversity and inclusion, now disengaged by the lack of progress	In favor of diversity and inclusion, but sees goal achievement as someone else's job	Takes personal responsibility for achieving diversity and inclusion goals

FIGURE 7 | Equality vs. equity in the short and long term

In this first image, it is assumed that everyone benefits from the same support. They are being treated **equally**.

Individuals are given different support to make it possible for them to have equal access to the view. They are being treated **equitably**.

All three can see the view without any support because the cause of inequality was addressed. The systemic barrier has been **removed**.

However, when it comes to behavior change, training is often only a scene-setter. The more complete story is that, to change people's behavior organizations need to adjust the system.

Why? First, biases can only be reduced rather than completely eliminated, and it is difficult to control biases that are unconscious. Second, biases can be embedded into the system of work itself, causing suboptimal diversity outcomes. Strategies to rewire the system make it easier to tackle biases and create a more comprehensive and sustainable solution.[30]

There are four steps to system rewiring:

1. *Using data to pinpoint leaks in the talent lifecycle.* To do this, organizations can look at the profile of their employees from recruitment to retirement, coupled with data on inclusion experiences.
2. *Identifying and remodeling vulnerable moments along the talent lifecycle.* These are points within specific talent processes where decision-makers are more susceptible to bias: for example, when decisions are discretionary and not subject to review.
3. *Introducing positive behavioral nudges, such as altering the default setting.* In 2013, telecommunications firm Telstra introduced "All Roles Flex," which made flexibility the starting point for all jobs rather than a special arrangement for some.[31]
4. *Tracking the impact.* Periodically review diversity and inclusion data to assess the effectiveness of changes made.

When the BMO Financial Group,[32] one of the 10 largest banks in North America, introduced an initiative based on these steps along with a communications and education campaign, it achieved

significant impact. First, a record 83.5 percent of people managers voluntarily completed the initiative's learning module within the first few months of its launch, signifying the program's value. Second, there was an unprecedented year-over-year increase in employees' perceptions of inclusion (+2 percent) and of having a "voice" at work (+2 percent). In addition, the hiring rates of minority group candidates increased by 3 percent in 12 months.

The truth is, rewiring the system is equally, if not more, important than retraining behaviors.

6. Tangible goals make ambitions real

When it comes to diversity and inclusion, nothing ignites greater debate than goals, targets, and quotas.[33] On the one hand, the setting of specific diversity goals has been found to be one of the most effective methods for increasing the representation of women and other minority groups. On the other hand, contentious arguments about targets vs. quotas, accusations of reverse discrimination, and fears of incentivizing the wrong behaviors have arisen around goal-setting efforts.

Our view is that tangible goals *are* important. (By goals, we mean measurable objectives set by an organization at its own discretion,[34] as distinct from dogmatic quotas.) However, their impact is tied to four conditions: *communication*, *coverage*, *accountability*, and *reinforcement*.

First, leaders should be capable of communicating confidently about what tangible goals do *and do not* mean. As Andrew Stevens, former managing director of IBM Australia and New Zealand, observes: "[Goals] don't guarantee a woman a job or promotion. What they do is to increase the probability that a talented woman will be considered alongside a talented man."[35] This is done by prompting decision-makers to cast a wider search for candidates beyond their default comfort pool of talent.

Second, tangible goals should incorporate measures of inclusion, not just diversity. If diversity is the only metric, the organization misses half the story. Leading organizations know this. The financial firm Westpac, for example, not only measures diversity outcomes, but also uses the annual employee survey to test whether individual "people leaders" are committed to the creation of a diverse-thinking workplace.[36] In the United States, facilities and food management firm Sodexo includes a diversity and inclusion competency in its performance management process, and 40 percent of a manager's scorecard is devoted to inclusive behaviors.[37]

> There has been an overemphasis on diversity, and an underemphasis on inclusion, as well as on the broader ecosystem of accountability, recognition, and rewards. The truth is, without appropriately crafted tangible goals, ambitions are merely ephemeral wishes.

Third, tangible goals can only work when key decision-makers are accountable. By taking accountability for goals, leaders signal the importance of diversity and inclusion as a business priority and help focus people's attention.

Finally, tangible goals are most effective when combined with broader acts of recognition and reward. This powerful truth sits behind the success of global initiatives such as MARC (Men Advocating Real Change),[38] the 30% Club,[39] the CEO Action for Diversity & Inclusion,[40] and MCC (Male Champions of Change)[41]—each of which implicitly recognizes the seniority and influence of its members. Conversely, there is embarrassment when leaders are called out for their organization's poor diversity and inclusion track record.

Our view is that tangible goals have often been bluntly crafted and poorly communicated. There has been an overemphasis on diversity and an underemphasis on inclusion, as well as on the broader ecosystem of accountability, recognition, and rewards. The truth is, without appropriately crafted tangible goals, ambitions are merely ephemeral wishes.

7. Match the inside and the outside

In 2015, Samsung launched its "Hearing Hands" commercial. Built around a day in the life of Muharrem, a hearing-impaired man, it revealed a new world in which Muharrem's neighbors engage with him for the first time in sign language, allowing him to feel much more connected to his community.[42] In 2017, TV2 Denmark launched its "All that we share"[43] campaign with a commercial that starts with the physical separation of people into line-drawn boxes based on stereotypical differences, and ends with a single larger group who now understands their shared points of commonality. That same year, Nike ran a commercial entitled "Equality," which promoted the message that if diverse athletes can be equal on the playing field, they "can be equal anywhere" because "worth outshines color."[44]

Each of these commercials went viral: 19 million views for Samsung, 4.5 million views for TV2 Denmark, and 5 million views for Nike. The question of why they were like cups of water spilled on dry earth underscores two compelling points.

First, customer diversity and inclusion have often been largely overlooked, with the lion's share of attention devoted to employee diversity. And when customer segmentation is considered, it is more in terms of a customer's financial profile than who customers are as people. As a consequence, services and products often reflect a stereotypical view of the customer. Lloyds Banking Group's 2016 review of British advertising found that many minority groups were underrepresented in advertising, and only 47 percent felt that they were accurately portrayed.[45] Similarly, Deloitte research from 2017 revealed that up to 1 in 2 customers from minority groups[46] felt that their customer needs were often unmet over the past 12 months.[47]

Second, customers are becoming, and starting to lean into, a sense of empowerment; they communicate what they stand for with their wallets and social media shares, and messages of equality have a pervasive appeal. Deloitte's 2017 research found that up to one-half of customers had been influenced to make a purchasing decision in the past 12 months because of an organization's support for equality—whether around issues of marriage equality, gender, disability, age, or culture. The purchasers did not come only from the groups directly targeted by the message (such as the hearing-impaired in the Samsung campaign); they included anyone who felt that the message of equality had spoken to their personal values.

The truth is that while many organizations have prioritized workplace diversity over customer diversity, both are equally important to business success. Moreover, customers are often more ready to support diversity and inclusion than organizations perhaps realize. But a word of caution: This is not about vacuous marketing. Commercials that lack authenticity will be shamed by the very customers they seek to attract.

8. Perform a culture reset, not a tick-the-box program

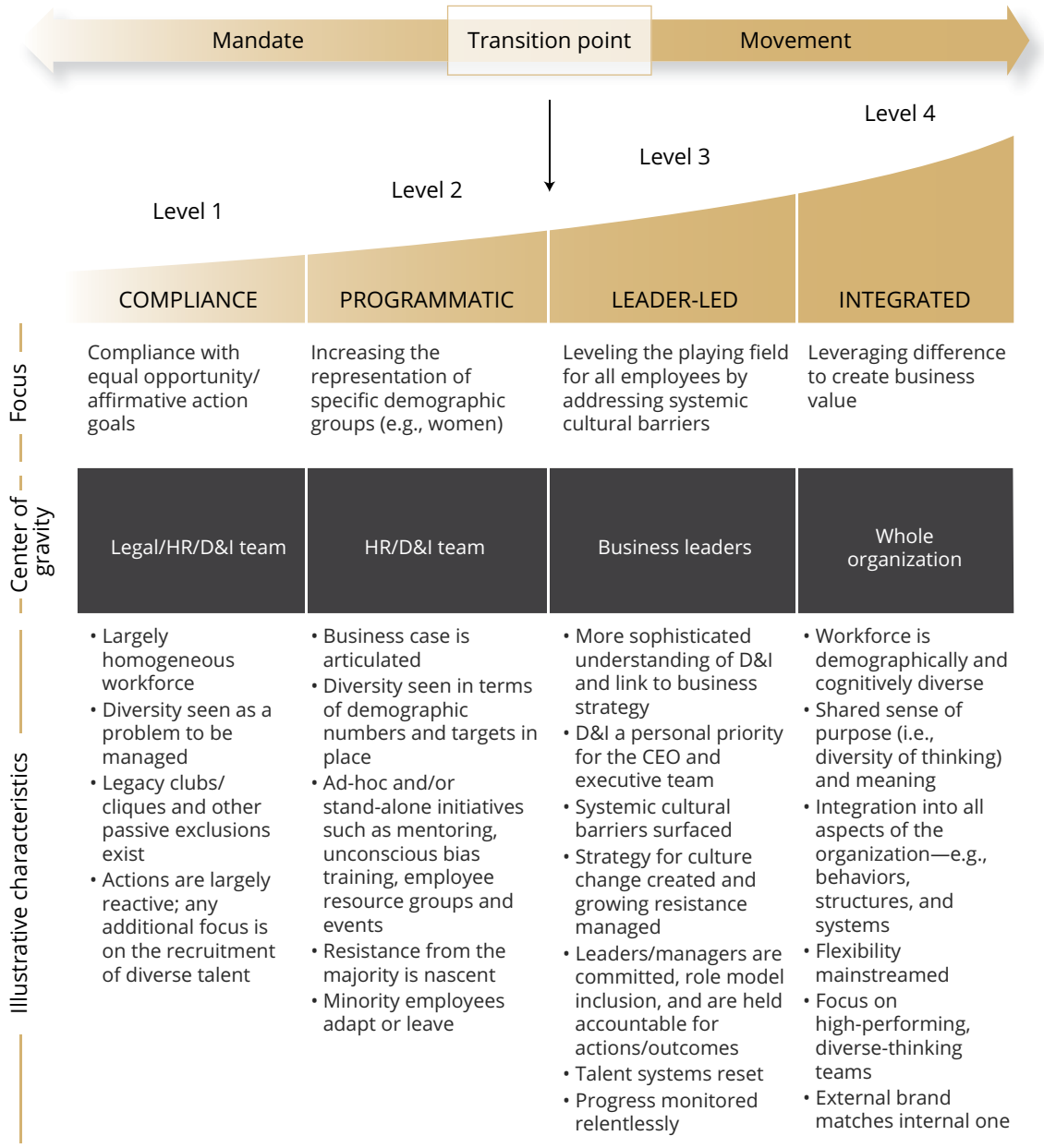
Our final truth is the most sweeping and underpins all seven truths above: *Most organizations will*

need to transform their cultures to become fully inclusive. While an overwhelming majority of organizations (71 percent) aspire to have an "inclusive" culture in the future, survey results have found that actual maturity levels are very low.[48]

What prevents the translation of these intentions into meaningful progress? Our experience suggests that organizations frequently underestimate the depth of the change required, adopting a compliance-oriented or programmatic approach to diversity and inclusion.[49] For most organizations, change requires a culture reset.

This is no simple task. Cultural change is challenging irrespective of the objective, but it

FIGURE 8 | The Deloitte diversity and inclusion maturity model



is perhaps even more so when the objective is an inclusive culture. Resistance is common: Those who are currently successful are likely to believe the system is based on merit,[50] and change to the status quo feels threatening. Consequently, change toward greater inclusion probably requires more effort than many other business priorities. And yet it usually receives much less.

Workplaces have emerged as a venue in which these disparate pressures have manifested and become much discussed. Caught in the middle, workplace leaders around the world tell us that they feel ill-equipped to navigate these swirling waters.

So what does the path to an inclusive culture look like?

Deloitte research identifies four levels of diversity and inclusion maturity: (1) compliance, (2) programmatic, (3) leader-led, and (4) integrated (figure 8).[51] Level 1 is predicated on the belief that diversity is a problem to be managed, with actions generally a consequence of external mandates or undertaken as a response to complaints. At level 2, the value of diversity starts to be recognized, with this stage often characterized by grassroots initiatives (such as employee resource groups), a calendar of events, and other HR-led activities (such as mentoring or unconscious bias training). At levels 1 and 2, progress beyond awareness-raising is typically limited.

More substantial cultural change begins at level 3—a true transition point—when the CEO and other influential business leaders step up, challenge the status quo, and address barriers to inclusion. By role-modeling inclusive behaviors and aligning and adapting organizational systems (for example, by tying rewards and recognition to inclusive behavior), they create the conditions that influence employee behaviors and mind-sets. Communications are transparent, visible, and reinforced. And at level 4, diversity and inclusion are fully integrated into employee and other business processes such as innovation, customer experience, and workplace design.

The truth is, significant change will not happen until organizations go beyond tick-the-box programs and invest the appropriate level of effort and resourcing in creating diverse and inclusive cultures.

Eight powerful truths, seven powerful actions

To borrow from Charles Dickens,[52] this is the best of times and the worst of times to be advocating for diversity and inclusion. On the one hand, there is a groundswell of global energy directed toward the creation of workplaces that are more inclusive: 38 percent of leaders now report that the CEO is the primary sponsor of the diversity and inclusion agenda,[53] and the formation of global initiatives speaks to the importance of these issues for the broader business community. On the other hand, some communities have become mired in divisive debates about equality (for instance, around issues related to sexuality, race, and religion).

Workplaces have emerged as a venue in which these disparate pressures have manifested and

become much discussed. Caught in the middle, workplace leaders around the world tell us that they feel ill-equipped to navigate these swirling waters. Believing in the business case, but feeling time-poor and uncertain, leaders question what to say (and what not to say) as well as what to do (and what not to do).

To address these eight powerful truths, we propose seven powerful actions:

1. Recognize that progress will take a culture reset
2. Create shared purpose and meaning by broadening the narrative to diversity of thinking and inclusion
3. Build inclusive leadership capabilities
4. Take middle managers on the journey
5. Nudge behavior change by rewiring processes and practices
6. Strengthen accountability, recognition, and rewards
7. Pay attention to diverse employees and customers

The truths we have presented challenge current practices, which are heavily weighted toward diversity metrics, events, and training. Our view is that the end goal should be redefined, cultures reset, and behaviors reshaped. Leaders should step up and own that change. Embracing these truths will help deliver the outcomes that exemplars have experienced. It will deliver the promised revolution.

JULIET BOURKE is a partner in Deloitte Human Capital and leads the diversity and inclusion consulting practice in Australia. She is based in Sydney.

BERNADETTE DILLON is a director in Deloitte Human Capital. She is based in London, United Kingdom.

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WALKING IN THEIR SHOES

FOR A LOW-INCOME mother with three kids struggling at school, the standard philanthropic solution would likely be some sort of educational intervention. But when a mother working with Family Independence Initiative (FII) was asked what *she* felt was needed, her response was striking. One of her children had asthma, and when that child had an asthma attack, she couldn't take the other kids to school on the bus. As a result, all of her children missed multiple days of school. What was needed wasn't educational assistance: She needed a car.

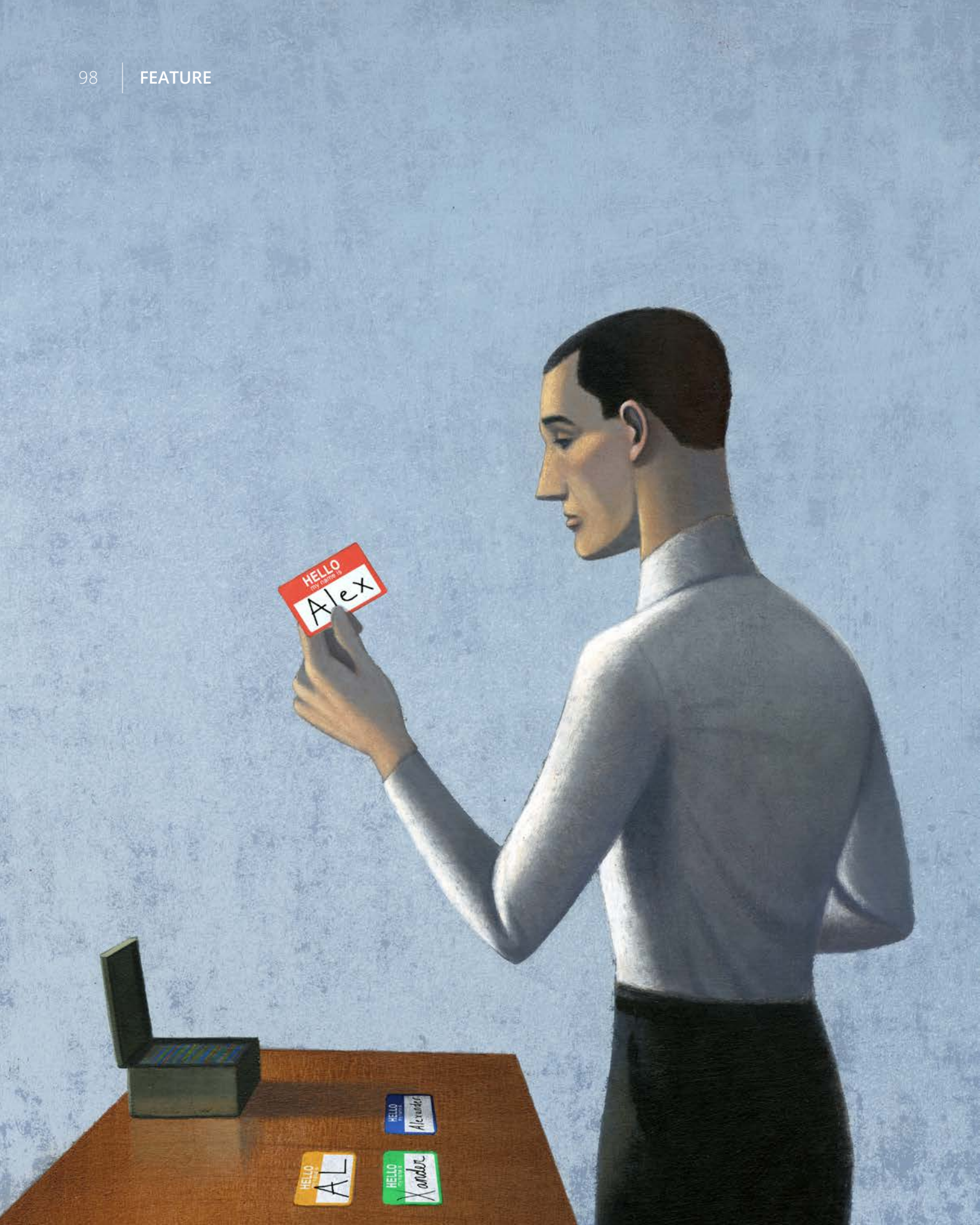
This story has a happy ending: The mother bought a vehicle after negotiating favorable financing terms, and her kids' school attendance and grades improved.[1] But the episode underlines the importance of social-sector organizations walking in the shoes of those they seek to help to provide what recipients actually need and value.

It seems self-evident. After all, seeking to deeply understand the customer's perspective has long been standard in the private sector, and is the foundation of design thinking. Yet the Monitor Institute by Deloitte found that information collected by many social-sector organizations is often not widely shared with constituents or used to directly benefit them.[2] One reason may be because existing incentive structures reinforce the philanthropic funder's ownership and control of data. Add this to the still-prevalent implicit assumption that "the funder knows best," and you have a power dynamic that can perpetuate inequities.

Fortunately, from FII and similar bright spots in practice, the social sector can draw lessons about how to approach monitoring, evaluation, and learning in a way that promotes equity and helps organizations take their constituents' perspectives into account:

- **Gather data about strengths, not just weaknesses.** FII's core philosophy is that the families it works with come from a place of strength. As a result, FII doesn't simply collect information about traditional assets and deficits, which, for low-income families, tends to emphasize needs. The organization *also* asks families to account for social and cultural resources that might otherwise be overlooked by traditional funders, such as informal child care arrangements and lending circles.
- **Develop ongoing processes for integrating lessons learned from constituents into program design and development.** Core operational decisions at FII—such as the decision to develop its technology platform in-house to safeguard family data rather than use a commercial platform—were driven by the families themselves.
- **Enable constituents to learn together.** FII reflects data back to families so that they can learn from their own data over time, as well as from trends among other families across the nation. The organization also enables peer-to-peer learning by connecting families with one another to share the challenges they have faced and the solutions they have discovered in the pursuit of their financial goals. ●

For more on the social sector's innovations in monitoring, evaluation, and learning, see *Reimagining measurement* on deloitte.com/insights.


HELLO
my name is
Alex
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YOU HAD ME AT HELLO

LEVERAGING BEHAVIORAL FACTORS AND PERSONALITY CUES TO IMPROVE CUSTOMER RELATIONSHIPS

by Robert Rosone, Rusty Lowe, and Susan K. Hogan

ILLUSTRATION BY JON KRAUSE

PEOPLE BUY FROM people they like. This is true generally, but particularly so in business-to-business selling, where building trust-based relationships has long been the foundation of sales success. Yet, as the pace of business decision-making accelerates and competition intensifies, there are fewer opportunities—and much less time—for sales executives to develop these relationships. Which invites the question: How can one make a positive and lasting impact right out of the gate?

Those who have worked at major corporations are likely familiar with tools and methods that seek to quickly and accurately define personality types. The Myers-Briggs Type Indicator, arguably the most famous of these diagnostic tools, was developed in the early 1900s based on the work of psychologist Carl Jung.[1] Today, the field is awash with alternatives, from DiSC to FIRO-B, Social Styles, and StrengthsFinder. The process and objective are similar for all: to better understand human behavior by grouping individuals based on personality traits such as consistent patterns of behavior, motivational drivers, and social preferences. Most often, organizational leaders use these models to help develop more effective working teams.

But how does one assess the personality of someone outside of the controlled environment of an individual company? Sales executives can't ask a customer to take a test—or at least, probably shouldn't! At Deloitte, we've been examining this issue and have in response developed our own tool, called Business Chemistry. While it still categorizes individuals into four primary types—*drivers*, *guardians*, *integrators*, and *pioneers*[2] (see figure 1)—it can also be used as a springboard to incorporate behavioral factors and contextual cues. In this way, it can provide outside-in analysis that extends its applicability from talent management evaluations and team-building considerations to exploring how this knowledge can improve inter-organizational relationships, such as the buyer-seller relationship.

Being able to quickly and accurately predict what makes someone tick is critical to building a lasting relationship with them. In this article, we'll walk through that process. And while we use Business Chemistry as the foundation for our work, we'd stress that these techniques can be applied independent of (or in conjunction with) other tools. In short, we'll show how to quickly determine a person's Business Chemistry type based on behavioral factors and contextual cues, understand the cognitive biases most prevalent for each type and how they are likely to influence decision-making, and how to use this knowledge to tailor communication styles and frame proposed solutions.

The way you wear your hat

"An online profile tells me a lot [about] an individual: what they talk about. If they talk about their passion more than what they do, they are likely a pioneer/integrator; if it is more about work, they are likely a driver/guardian."

– Deloitte sales executive[3]

Whether a first interaction with someone is going to be virtual or face-to-face, there are many ways to get to know customers beforehand. Online tools such as LinkedIn, Facebook, and corporate website profiles reveal background information, such as their academic and professional achievements, but they can also hint at their personality and preferred interaction style. Do their summaries focus strictly on work or do they mention outside interests? Are they detailed or to the point? Also look at email communications. For example, if emails are short and direct, there is a good chance they are a driver. However, depending on the person's age or industry, emails and online summaries can be deceptive. Some people, particularly older customers, or those in certain industries, may not as be as chatty or descriptive as others. Additionally, some companies have strict guidelines about online profile content.

FIGURE 1 | Business Chemistry types

Analytical thinkers. Intellectually creative, drivers prefer experimentation over theorization. To them, business is just that: business. They have limited tolerance for small talk, and aren't afraid to ruffle feathers to get their point across.

Realists. Detail-oriented, guardians excel at providing structure and minimizing risk. They can be reluctant to pursue unproven ideas and often deliberate thoroughly before making decisions.

Connectors. Masters of empathy and nuance, integrators are skilled at understanding the broader context of an issue. They often take time to consider everyone's opinions and socialize an approach before moving forward.

Blue-sky ideas people. Highly adaptable, pioneers can thrive in multiple environments. They do best when exploring possibilities and redefining the status quo, but can feel weighted down by structure and details.

Source: Adapted from Kim Christfort, *CFO insights: The power of Business Chemistry*, Deloitte, 2013.

So, while it is good to do one's homework, don't rely too much on this information.

As with all relationships, the real action starts with the first live meeting. Successful sales executives tend to err on the side of caution, often starting "in the middle" then flexing toward one type or another based on how a client's work style shows itself throughout a conversation. Based on feedback from our own sales executives' field observations, provided in figure 2 are some insights for what cues to look for to help identify which Business Chemistry type someone is.

RESPONDING APPROPRIATELY: MEETING THEM WHERE THEY ARE AT—ON THEIR TERMS

"If I have never met someone before, I go in completely open-minded, despite what is on LinkedIn, and I'll just adapt quickly."

– Deloitte sales executive

Now that a sales executive has identified their client's Business Chemistry type, how should they adjust their interaction style to align with that of the client? Figure 3 provides some general guidelines based both on the Business Chemistry literature and sales executives' experiences.

Beyond helping us form the relationship and interact better, understanding the Business Chemistry type of decision-makers also provides an idea of what cognitive biases—systematic deviations from seemingly rational judgment[4]—may come into play when they are making decisions. Drawing from the behavioral science literature, below are some common decision-making biases clients may fall prey to, as well as which types are likely to be prone to each bias.

WILLINGNESS TO CHANGE DIRECTIONS: ACTION MIND-SET

"I rapidly try to alter my presentation based on what I think their 'personality' is—if it is a pioneer, it's going to be a long journey . . . If it is a driver, it's going to be short and sweet."

– Deloitte sales executive

An action mind-set is the frame of mind a person is in when they are called upon to act. There are

FIGURE 2 | Behavioral and contextual cues for each Business Chemistry type

BEHAVIORS			
DRIVER	**GUARDIAN**	**INTEGRATOR**	**PIONEER**
• Walks ahead • Firm handshake • Eye contact • Talks fast • No small talk • Punctual • Prefers shorter meetings, always ending on time—or even early	• Walks behind • Quick and fast handshake • Self-disciplined perfectionist • Dry, witty humor • Thoughtful, serious • Takes time making decisions	• Walks with • Warm, softer handshake • Extended touch • Friendly and interested, calm • Diplomatic • Likes group meetings, consensus	• Wild card walk • Enthusiastic handshake • Talkative, fidgety, impatient • Charismatic, engaging • Relationship-oriented • Creative
WHAT'S IN THEIR OFFICE? ENVIRONMENTAL CUES			
• Maps; battlefields; staged family pictures • Expensive furniture	• Framed degrees; lots of charts • Everything in its place	• Family photos; art, landscape, lively plants • Matching everything!	• Messy; likes "sayings," plants, and flowers (but likely dead) • Papers on table

FIGURE 3 | Do's and don'ts for each Business Chemistry type

two phases of action mind-sets: *deliberative* and *implemental*. When individuals are in a deliberative mind-set, they are more receptive toward new ideas.[5] Guardians are likely to stay in the deliberative mind-set phase for a long while before moving into the implemental phase. Drivers, meanwhile, are likely to move quickly through the deliberative into the implemental phase. While recent Deloitte research suggests there may be opportunities to move clients back to a deliberative state from an implemental state,[6] given drivers' decisive natures, realize that moving them back may be difficult. Conversely, while pioneers may also move quickly from the deliberative phase to the implemental phase, they are more likely to move back and forth between phases given their tendency to follow their guts and easily pivot if the situation changes. Like guardians, integrators may stay in the deliberative phase longer before moving to the implemental phase. However, integrators may also exhibit the propensity to move fluidly back and forth between phases, and can change their minds based on input from various stakeholders.

How should a sales executive adjust to work with these different work styles? When dealing with drivers, come forward with "ready-to-go" solutions along with alternative options that could be quickly deployed. When working with guardians, be ready to revisit and revise the proposed solution until it lines up with their vision and priorities. With integrators, also be prepared to not reach an ultimate verdict in the initial meeting; for them, though, the next steps may require gaining additional buy-in from other stakeholders, as well as collaborating with others before signing off. For pioneers, brainstorming sessions—possibly many—are likely to be an integral part of the process.

CENTRAL AND PERIPHERAL CUES: CONTENT VS. STYLE

"In the end, the ability to win often comes down to, did they like us, did they feel we would be easy to work with, do they think we could help execute on time."

– Deloitte sales executive

Another behavioral concept to consider is determining which types of information clients care about. This information can include factors central to the solution and the decision being made, called *central cues*, or those tangential to the message, known as *peripheral cues*. Peripheral cues can be nonverbal (for example, a seller's handshake or eye contact), or verbal communications tied less to a message's content and more to its style (for example, the time spent building rapport, how the message is delivered, and the path taken to get to the point of the discussion).

Psychological research suggests that people are persuaded by both types of information: that which is directly relevant to the decision being made, and extraneous or seemingly irrelevant information.[7] The challenge for sales executives is understanding which peripheral cues matter to each Business Chemistry type. While drivers may seem to focus primarily on central cues, wanting to stick to the main points and avoid tangents—particularly in the early stages of the relationship—that doesn't mean they turn a blind eye to other factors. For them, the peripheral cues that may catch their attention would likely have to do with whether they sense the sales executive is competent and confident (for example, good eye contact, punctuality, a firm handshake, and limited use of qualifiers). Integrators, however, take more of an interest in learning about what makes the person across the table from them tick: their interests, their passions, and/or people they may know or have worked with. Given pioneers' penchant for innovative thinking, they are also more likely to be interested in and attuned to peripheral cues. While the cues they focus on may seem tangential at the time, they may later draw upon that information during brainstorming conversations, as nuggets that could lead to out-of-the-box solutions not yet considered. Finally, guardians may cue into factors that signal whether a sales executive is thoughtful and thorough (for example, if they brought with them detailed background information).

For customer relationship building, it's also important to determine *when* to focus on which aspects. This may have to do with the preferences of the primary decision-maker (for drivers, central cues or facts first, small talk or peripheral cues may occur later; for pioneers, the reverse), the type of meeting or phase in the process (some phases are about getting down to business, others are more about building rapport), and which additional stakeholders are involved at each stage.

NO PERSON IS AN ISLAND

"One of my clients is a funeral home firm. There, everyone is quiet, reserved, extremely patient, and they talk slowly. At my other client—a tech start-up—the environment is completely different."

– Deloitte sales executive

Much as the staunchest driver would deny it, we are all influenced by our history and environment: our backgrounds, where we live, who we work with, and our industry sector. These pervasive ecosystems influence our thoughts, opinions, behaviors, and decisions.[8] With this knowledge, sellers must not only strive to understand the work styles of the individuals they are calling on, but also the overarching cultures of their organizations. Just as different types may be drawn to New York vs. the Midwest, so, too, might different industries appeal to different types. However, just because an industry might have a certain "personality," such as a tech start-up having a "pioneering" spirit, that doesn't mean there aren't other "hidden" types within the firm, such as guardians and drivers. Savvy senior executives will surround themselves with a mix of types to help accomplish their various objectives.

IF IT AIN'T BROKE, DON'T FIX IT: STATUS QUO BIAS

"A lot of this is about comfort level—what is most comfortable for you to do? It is like sitting in a comfortable chair you have already broken in . . . That is the same thinking people apply when presented with new products or services."

– Deloitte sales executive

Another common decision-making bias is the *status quo bias*—the tendency to stick with the current state of affairs instead of embarking on any sort of change.[9] This bias comes into play, for example, when an unsatisfied customer stays with the same vendor, product, or service, choosing not to consider alternatives. Our analysis suggests that falling prey to status quo bias is particularly prevalent for guardians and a concerted effort is likely required to get them to consider new options. How to combat this? Consider asking the client to share some of the things their current provider is doing that they value. Then, challenge these clients by also asking what other things they wish their provider would do. This can open the door to other opportunities. Sales executives should continue to dig deeper through questioning to fully understand what is causing the aversion to change. Often, it is a desire to avoid a potential risk, which leads to our final cognitive bias consideration.

RISK VS. REWARD

"I see the integrators always punting the decision to their team, then saying 'we' did this. Whereas drivers want to take the risk and be the risk-taker, saying 'I' spent $4 million and 'I' did a great job. Pioneers are similar . . . the stronger the pioneer, the greater the willingness to take risks."

– Deloitte sales executive

Loss aversion suggests that many people are more concerned about avoiding bad outcomes than achieving new heights.[10] But how do clients define a bad outcome or perceive a salient risk? While financial or performance risk may be top of mind, these aren't the only risks people care about. Understanding what clients are trying to avoid can prove invaluable to not only closing the deal, but closing it in a timely fashion. Sales executives need to ask the right questions to understand and determine which risks are keeping each stakeholder up at night. A failure to do this work can result in the following response: "Well, it is just not the right thing for us (right now)." This finding is consistent with the behavioral science literature, which suggests that the greater the perceived risk, the slower the adoption of a new innovation.[11] Guardians are the most risk-averse, drivers care primarily about *performance risk* (the likelihood that the solution will not perform as anticipated), integrators care most about *social risk* (the probability that other important stakeholders will not approve),[12] and pioneers are the least risk-averse. Yet, even when dealing with a pioneer, business decisions are rarely made in isolation; at some point in the selling process, sales executives will have to ensure that they are addressing any and all salient risks.

You go your way . . . and I'll go your way, too

We're not suggesting personality and work style assessments are infallible. Everyone is unique, and we're all driven by motivations and biases the most exhaustive analysis may fail to uncover. But we've found Business Chemistry to be a robust way of identifying people's behavioral tendencies. Drawing upon these findings, our sales executives' insights, and behavioral economics lessons provided in figure 4 are what we perceive as the top three cognitive biases each type is likely to fall prey to—and the strategies that can be used in response.

A few final thoughts.

Gone are the days of strictly one-on-one business relationships. While in the end there may be one person who "holds the keys," increasingly there are multiple stakeholders involved in decision-making. What each individual wants, in terms of

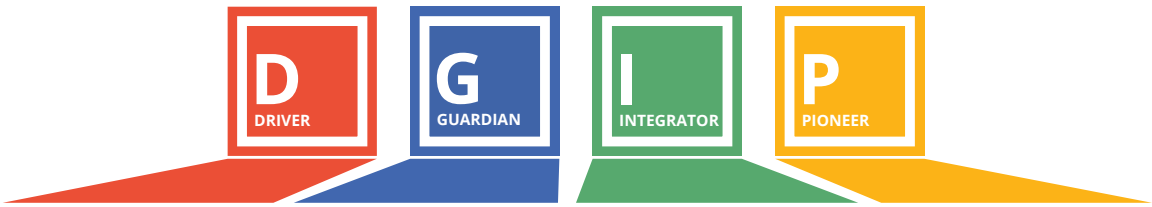
supporting materials and next steps, varies; a driver would likely ask for different follow-up actions than would an integrator. Sales executives must build a relationship with each person, and tailor the follow-up to ensure that all stakeholders feel like their needs are being addressed and they are part of the decision.

"I bring people from my team based on who I know is going to be at a meeting, and then align my Guardian with their Guardian, etc."

– Deloitte sales executive

Internal communication and coordination are critical. While understanding the preferred work styles of clients is critical, equally important is understanding the strength and skills of one's own team. This will provide opportunities to leverage the team's abilities while moving through the relationship-building and decision-making process, and help other team members capitalize on what's known about the client and not have to start from square one (or undo any impressions or efforts the primary client contact has already made). Understanding one's own strengths,

FIGURE 4 | Top three cognitive biases and suggested strategies for each Business Chemistry type



Performance risk: Articulate the reliability of solution and proven track record (provide references, demonstrate experience).

Central and peripheral cues: Stick to the main point, avoid tangents; minimize use of qualifiers and make eye contact to exude competence.

Action mind-set (implemental): Have a "ready to go" solution and alternative

Risk aversion (high): Focus on minimizing risks vs. upside potential, ROI; offer frequent project checkpoints and status meetings.

Status quo bias: Emphasize how the solution fits well with existing processes, models, operations, infrastructure, and budgeting framework.

Action mind-set (deliberative): Be ready to revise the proposed solution to align with evolving priorities.

Social risk and conflict avoidance: Demonstrate how the proposed solution has gained buy-in and consensus from various stakeholders. The solution may require collaboration with other parties.

Central and peripheral cues: Provide personal and professional examples involving relationships and collaborative activities. Communicate that other stakeholders have embraced the solution. Demonstrate success with other projects within firm.

Action mind-set (deliberative): Don't expect to reach a verdict in the initial meeting. Next steps may require gaining additional buy-in from various stakeholders, as well as collaborating with others.

Risk aversion (low): Focus on the solution's upside potential (value). Don't worry so much about minimizing risk concerns.

Status quo bias (low): Be willing to propose a solution that goes outside of lines and breaks the status quo. It's safe to propose disruptive solutions.

Central and peripheral cues: Be willing to brainstorm and go in the direction of tangents, going off-topic.

"TIMES ARE CHANGING": THE INCREASING ROLE OF CONSENSUS AND COLLABORATIVE DECISION-MAKING

"I notice a cultural trend toward consensus. Companies are now having multiple people interviewing someone. It's not just human resources and the lead person doing the interviewing, they have team members interviewing. Now when you look at decisions, they are integrating all the stakeholders in a different way—so everyone has a louder voice."

– Deloitte sales executive

While a pioneer may be willing to take more risk, and drivers may be laser focused on performance, our experts are observing more and more of the integrator traits emerging in meetings with clients. This is consistent with the strategic trend for C-suite members in general to be more collaborative[13] and recent research suggesting CFOs should strive to be "catalysts" and "strategists," as opposed to merely "operators" and "stewards."[14] So today, instead of serving as the sole negotiator, a CFO who is clearly a driver is more likely to "change up" or flex to give his or her team a chance to weigh in on decisions.

weaknesses, and proclivities is key. As one sales expert explained, sometimes that could involve having a team member—or team members—accompany the sales executive, or even take their place for certain meetings. "I know myself," one sales executive said. "I am emotionally easy to read—you can see when I am upset, which, in some cases, could throw off the dynamic of a meeting." Self-aware relationship managers know when their absence is more powerful than their presence.

A journey of a thousand miles begins with a first step. Starting the relationship on the right foot by connecting with the client right out of the gate is important. Like all relationships, there will be missteps, and things will not always go smoothly. But by taking the time to understand a client's work style, biases, and preferences, the path should be much smoother. An understanding of the client's work style can be leveraged throughout the life cycle of the relationship; it should never be thought of as a tool to unduly influence or persuade the client. Rather, the hope is that knowing this information will lead to more productive communications, interactions, and value. The end goal should remain that of creating long-lasting, strong, trusting, and mutually beneficial partnerships.

ROBERT ROSONE is a managing director and a leader of Deloitte Growth Enterprise Services, which is focused on serving mid-market and privately held organizations. He is based in Parsippany, New Jersey.

RUSTY LOWE is a client sales executive with Deloitte Services LP's Deloitte Growth Enterprise Services division. He is based in Atlanta, Georgia.

SUSAN K. HOGAN is a research manager with Deloitte's Center for Integrated Research. She is based in Atlanta, Georgia.

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Are feedback monsters running rampant in your office?

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LAST MILE FIRST MOVERS

IT'S NO SECRET that shoppers continue to shift online at the expense of brick-and-mortar stores. Yet most consumer expectations around the delivery of goods seem increasingly similar to buying in-store: They want products more quickly, are unwilling to pay for that privilege,[1] want to know where their goods are at all times,[2] and are willing to walk away if these conditions aren't met.[3] Rising demands on retailers are, in turn, often straining transportation networks, prompting both industries to explore a variety of novel approaches to consider in solving the last-mile delivery challenge:

- ***Digitization***. Reducing delivery times by measuring route efficiency and increasing the effectiveness of preventative maintenance is giving way to examining the driving styles of individual operators and what that means for tire wear.[4] And that's just the beginning: For example, Singapore's FreshTurf is building an open platform based on blockchain technology that allows customers and carriers to trace a package all the way from shipment to smart locker.[5]

- ***New urban supply concepts***. Speaking of smart lockers, these accessible but secure locations to temporarily store goods for customers to pick up later have the potential to significantly reduce the number of delivery destinations. And some lockers are mobile, able to meet delivery workers at different locations, minimize the time between deliveries, and allow workers to complete more jobs in less time with less stress.
- ***Asset sharing***. Just as carsharing and ridesharing have challenged traditional models of personal movement, greater sharing of commercial vehicles could reshape how carriers operate. A transparent, real-time platform that offers shippers, drivers, and customers visibility into real-time capacity and demand would increase asset utilization and make pricing more representative of the market.[6] Some start-ups, such as Seattle-based Convoy, are already building on this idea, and as the technology matures, it may become a larger part of the transportation portfolio.[7]
- ***Alternative vehicles***. Promises of greater fuel efficiency and improved safety mean electric trucks may overcome their limited range, which has until now limited their use to crowded urban areas. Drones are another possibility—one Chinese company deploys drones to deliver 500 parcels a day to cities and rural areas.[8] Almost anything seems worth trying: Other carriers in China are covering the last mile using bicycle teams.[9]

Customers seem to increasingly want the advantages of online shopping—convenience, selection, price competition—but none of the disadvantages, such as waiting for products to arrive. Most want the instant gratification of traditional retailing. With delivery seen as an integral part of a seller's responsibility, this shift in expectations often means carriers are putting more than packages on their trucks—they're delivering an organization's reputation.

For a comprehensive analysis of the challenges facing the shipping sector, read *The future of freight* on deloitte.com/insights.

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Norman's approach to human-centered design in the writing of *Nudge*.

24. When the population-level base rate of an event is low, and the test or algorithm used to flag the event is imperfect, false positives can outnumber true positives. For example, suppose 2 percent of the population has a rare disease and the test used to identify it is 95 percent accurate. If a specific patient from this population tests positive, that person has a roughly 29 percent chance of having the disease. This results from a simple application of Bayes' Theorem. A well-known cognitive bias is "base rate neglect"—many people would assume that the chance of having the disease is not 29 percent but 95 percent.

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Can CEOs be un-disruptable?

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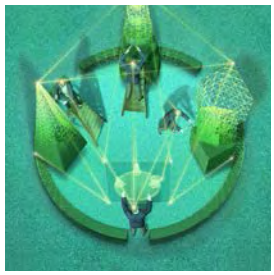

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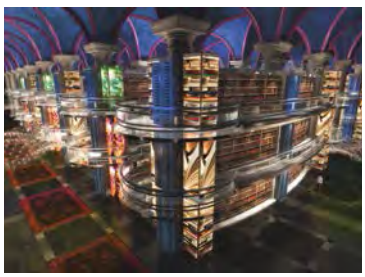

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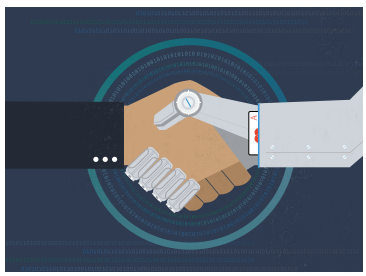

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KIM JOHNSON
Stamford, Connecticut

JON KRAUSE
Philadelphia, PA

DIETER BRAUN
Hamburg, Germany

THE END NOTE

{ What we said then }

"Companies are broken, and many don't know [it]. Many companies are reporting record profits, but longer-term trends suggest they are struggling. Absolute profits . . . matter little—at a minimum, profits should be considered relative to total revenue to get a sense of whether profits are rising faster or slower than revenue. But even that analysis overlooks a critical component of business activity: the assets required to run a business. Ultimately, companies need to earn a healthy return on those assets in order to stay in business."

From "Success or struggle: ROA as a true measure of business performance"
By John Hagel, John Seely Brown, Tamara Samoylova, and Michael Lui
Published October 30, 2013

{ What we think now }

"THERE'S AN INCREASING disconnect between the way the world is evolving and the way companies are responding. That's why we wrote that companies are *broken*, not just under pressure. They're continuing to use very traditional business approaches in a world that's demanding something fundamentally different.

Companies are still applying various forms of financial engineering to cushion shareholders from the blow of deteriorating performance—everything from stock buybacks to increasing dividends to adding debt to the balance sheet. But at some point, they'll have to face the fundamentals of their business and figure out why performance is deteriorating. We continue to believe that the most helpful financial measure of the fundamental performance of the business is return on assets (ROA), and the erosion in ROA for all US public companies has been significant and sustained over a period of decades.

JOHN HAGEL
Co-chairman of Deloitte's Center for the Edge

Traditional businesses have been run around the model of scalable efficiency: aggressively cutting costs and getting more efficient at greater and greater scale. In the new world, that approach is actually less and less efficient. They should focus on what we call scalable learning—how do we help everybody in the company learn faster, together, and improve performance more rapidly, not just in terms of cutting costs but in terms of increasing value?

That's a fundamental shift. It changes everything in terms of how you organize the business, operate the business, and the kinds of strategies you pursue. It's going to take a willingness to step back and ask some of the most fundamental questions of all: What business are we in? What's the reason we have a company? This new world requires committing to a fundamental transformation of business. Everything has to be reassessed. ●"

Deloitte Review is printed by a company that has been a long-term leader in environmental responsibility.

The facility uses vegetable-based inks and alcohol-free chemistry in the pressroom. Computer-to-plate technology replaces film and photographic chemicals in prepress operations, with all metal plates collected and recycled.

The company was among the first printers in Western Canada to recycle its water-miscible waste solvent, resulting in a reduced environmental impact. A chemical distiller allows the facility to distill, recycle, and reuse the chemicals from its presses, eliminating the need to send out hundreds of barrels of contaminated chemicals per year to be disposed of or recycled.

Its paper-baling equipment recycles up to 40 tons per month of trimmings, vastly reducing waste while capturing paper dust that affects air quality as well as product quality.

This issue of *Deloitte Review* is printed on Anthem Matte, resulting in these savings:*

Wood consumption:	Reduced by 9.9 tons
Net energy use:	Reduced by 27 million BTUs
Wastewater generation:	Reduced by 30,350 gallons
Solid waste production:	Reduced by 1,910 pounds
Greenhouse gases:	Reduced CO_2 by 6,682 pounds

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*Source: Environmental Paper Network, papercalculator.org.

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