Stanford Business

SUMMER 2017

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INTELLIGENCE

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A LETTER FROM
DEAN JONATHAN LEVIN

Prepare for the Future Now

In June, I spoke at Stanford GSB's commencement for the 502 students who graduated from our MBA, MSx, and PhD programs. I was joined by Penny Pritzker, MBA/JD '85, former U.S. secretary of commerce, who was the guest speaker. It was thrilling to celebrate the achievements of our graduates and to contemplate all they will accomplish in the future.

As our newest alumni move on to exciting career challenges, it seems a fitting time to reflect on the initiatives we are advancing to position our students and the school for success in the years ahead. Some of our activities are a response to emerging interests of students and faculty, while others are driven by our desire for the GSB to make a national and global impact on people and organizations.

Perhaps it is the current social or political climate, but members of the first-year MBA class set a record this past year in displaying a desire to apply their management skills to social impact endeavors. One in three applied to participate in one of the school's social innovation experiences — an all-time high. While business, management and leadership principles remain at the core of our curriculum, it is encouraging to see students with a strong sense of civic responsibility and purpose emerge from the school.

On the global front, we are focused on the reach and impact of our programs. The MBA Class of 2018 hails from 62 countries, while more than half of our MSx students are international. Many of these students will take jobs in the United States, contributing to our national leadership position. We are building our global presence through our nondegree programs. This year, the LEAD certificate program, our one-year online program in corporate innovation, enrolled nearly 180 participants from 35 countries. In total, around 2,000 executives living outside the U.S. participated in GSB non-degree programs on campus or abroad.

Earlier this year, the Stanford Institute for Innovation in Developing Economies, known as Stanford Seed, launched the Seed Transformation Network, a professional network that connects Seed participants across more than 12 countries. We expect the network to increase from 150 entrepreneurial leaders today to 1,000 in five years. And next month, I will to travel to Chennai, India, with Stanford President Marc Tessier-Lavigne, GSB faculty, staff, and alumni to open a third Seed innovation hub, in addition to those in Accra, Ghana, and Nairobi, Kenya.

Two other areas where we can make an impact on people and organizations are by enabling our faculty to apply their research by connecting with businesses and policy-makers, and through increased collaboration with Stanford's six other schools. One example of this cooperation is GSB faculty member Erica Plambeck's research with professor Rosamond Naylor at the School of Earth, Energy & Environmental Sciences to develop sustainable production practices for small-holder palm-oil producers. This is one of dozens of research projects that allow us to harness the horsepower of Stanford faculty to support a mission of fostering economic growth and ending the cycle of global poverty. Few universities have comparable ability to leverage their diverse resources to address the business, social, and environmental challenges we face in the world today, and I am so excited that Stanford and the GSB are leading the way.

We, too, want to make sure that our core programs are prepared to thrive in the decades ahead. In April, we established two long-range planning committees as part of a university-wide effort to envision Stanford's future. Many members of the GSB are involved in Stanford's planning process, and we will be working with the deans and faculty from other schools to examine education, research, community, and external engagement across Stanford.

The GSB's Committee on Research on Advancing Management is chaired by faculty members Sarah Soule and Andy Skrzypacz and will consider how our research can expand the frontiers of knowledge while having an impact on Stanford's educational programs, outside organizations, and society. Faculty members Anne Beyer and Yossi Feinberg chair the Future of Management Education Committee, whose members include GSB faculty, staff, students, and alumni. This committee is soliciting ideas, developing concepts, and examining opportunities to strengthen student programs, with the goal of introducing new elements and initiatives to our management education curriculum. (See the article about both committees on page 58.)

I have asked these committees to think broadly and take into account potential ways to strengthen the GSB community, enhance our ties with the university, and deepen and broaden our engagement beyond our campus.

By examining the interests and experiences of our current students, alongside global economic, social, and political trends, we will continue to be a leader in management education. We are committed to ensuring that tomorrow's students, like those who graduated in June, will be prepared to excel in a range of business opportunities and to meet the school's mission of educating individuals who will make a positive impact in the world. ▲

Jonathan Levin is the dean of Stanford GSB and the Philip H. Knight Professor.

Drew Kelly

Jonathan Levin

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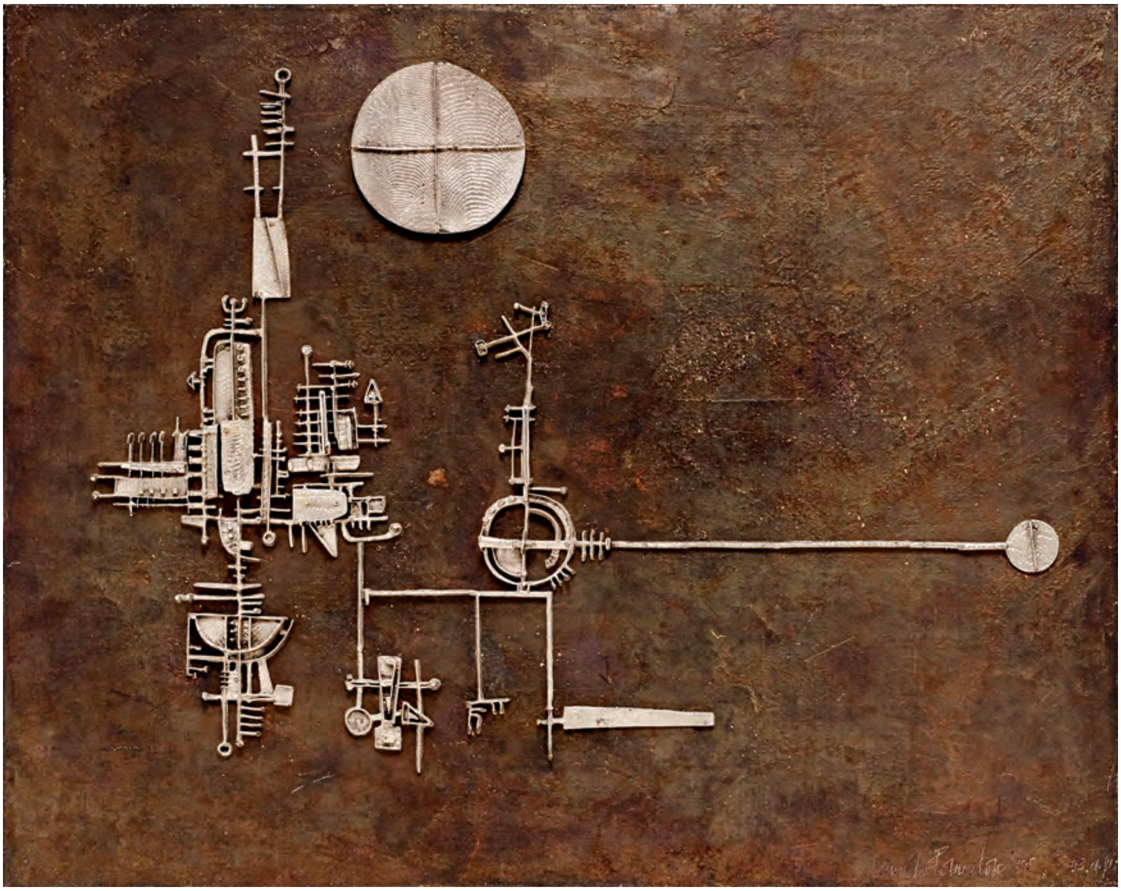
Cover illustration by Mike McQuade

Above: Phil Bray/20th Century Fox/Everett Collection; left: Rodrigo Ceballos

FROM THE EDITOR

LAUGH AND LEARN

For those of us who spend most of our days at work, I have some bad news. Research shows that we laugh more on weekends than on weekdays and that we grow humorless as we get older. ▶ That is bad for business, according to Jennifer Aaker, a marketing professor at Stanford GSB, who says that cultivating a culture of humor in the workplace reduces stress and improves worker retention. ▶ To remedy this comedic decline, or at least give you a laugh, we have an essay in this issue by funny man Joel Stein, a humor writer who helps inform Aaker's course about humor. Why discuss laughter in a magazine exploring the theme of "Intelligence"? ▶ For one thing, humor is a sign of emotional intelligence, which can be as important in business as knowing how to dissect earnings reports. ▶ Kirsten Moss, the new Stanford GSB admissions director, says in an interview featured on page 56 that choosing the leaders of tomorrow is "as much of an art as a science." Moss is no stranger to the campus or to the concept of emotional IQ. She most recently served as a facilitator for the *Interpersonal Dynamics* course here, known affectionately as "Touchy Feely," in which students explore various styles of leadership behavior. ▶ As for those of us at *Stanford Business* magazine, we are in good humor. We just learned that the Council for Advancement and Support of Education gave this magazine and one of our video projects high honors in its 2017 Circle of Excellence Awards, which recognize outstanding work by universities throughout the nation. ▶ The video, "Inside Sports Management," features four alumni working in pro sports and GSB professor George Foster. The judges compared it to something ESPN would produce. Regarding the magazine, they wrote, "the Stanford Graduate School of Business targets its audience with a publication informing and inspiring through knowledge." ▶ We couldn't have described our mission in a better way. We hope you agree. Enjoy, and as always we love to hear from you, especially if you have a humorous business story that will allow us to laugh and learn at the same time. — DEBORAH PETERSEN, EDITORIAL DIRECTOR



The Moon, the Sun, the Tower (La luna, il sole, la torre), by Arnaldo Pomodoro

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ENGAGE

Readers Share Their Thoughts on Beginnings

Having had a kidney transplant in 2013, I was very interested in the article "Reducing the Wait Time for Kidney Transplants" in the Spring 2017 issue.

I was 79 when I was told that my kidneys were failing due to the naproxen prescribed previously for arthritis, and I learned quickly that a patient must be very aggressive in finding a kidney and funding for the surgery medication afterward. The odds against somebody my age getting approved for a transplant were astronomical. However, I was in good physical and mental health, and my doctors at Emory University Clinics aggressively pushed my case. After extensive tests, I was approved for the Emory Transplant Center list in Atlanta. I also submitted my name to the Veterans Administration list in Knoxville, Tenn.

I figured that I would not live long enough to arrive at the top of either list, so I mounted a campaign to find a live donor. I printed and distributed posters and cards with my picture holding a sign: "Veteran needs a kidney." I also approached the Fox TV outlet in Atlanta and my story was featured on two shows and in a local newspaper. A mother and her two adult daughters saw my poster in a local restaurant, and 11 months after applying, I received the perfect kidney from a 33-year-old total stranger. I was fortunate to be on Medicare, which paid for the operation. And the VA pays for my ongoing medications.

Today I am 82, going on 83, and I try to pay it forward with others facing this problem.

—LAWRENCE MILLER,
MBA 1963

Editor's note: In the last issue, we included an incorrect link to our survey about team building. Fortunately, some readers found us. Here's a letter from one:

If the team isn't working, hire an outside facilitator to do a few touchy-feely sessions.

Regardless, develop team norms together, and hold each other truly accountable. As the leader, be mindful that junior staff will likely not hold senior staff members accountable — make sure your eyes are wide open to determine if everyone is following the norms.

—ALLISON COPPEL,
MBA 2006

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STANFORD BUSINESS ONLINE

EDITED BY SHANA LYNCH

Marc Andreessen

Kiefer Hickman

WEB

“You have to be ruthlessly open-minded and constantly willing to reexamine your assumptions. You have to take the ego out of ideas.”

Marc Andreessen, venture capitalist, during a View From the Top discussion.

Read more: *stanford.io/Assumptions*

PODCAST

Forget Your Lead — Focus on Your Goal

Professor Szu-chi Huang discusses what derails people from reaching the finish line.

stanford.io/Goals

WEB

The Double Standard on Wall Street

Male investment advisers commit more misconduct than their female colleagues do but are less likely to get fired.

stanford.io/GenderBias

YOUTUBE

Effective People Think Simply

Ask yourself these three questions to make faster decisions.

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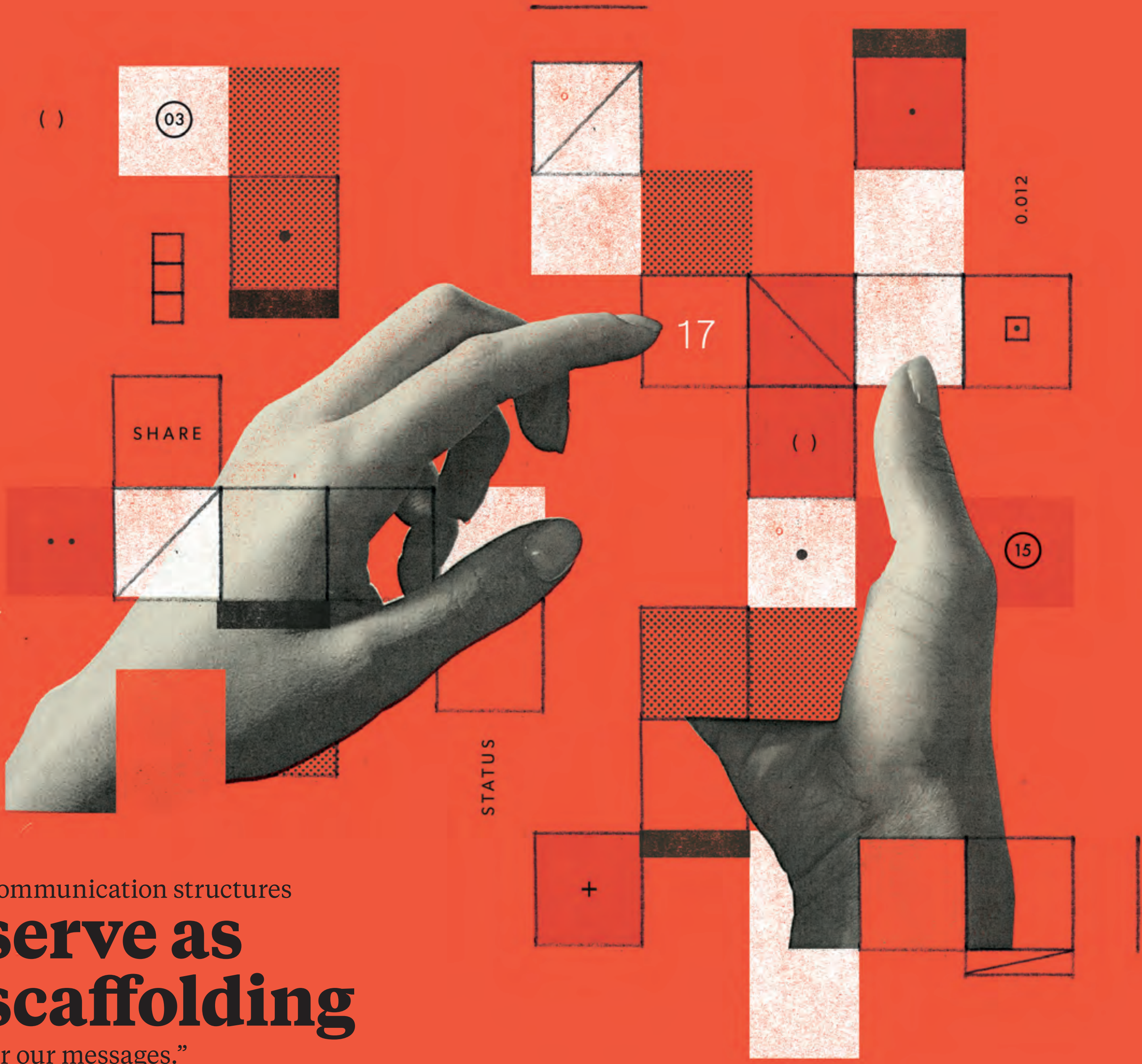
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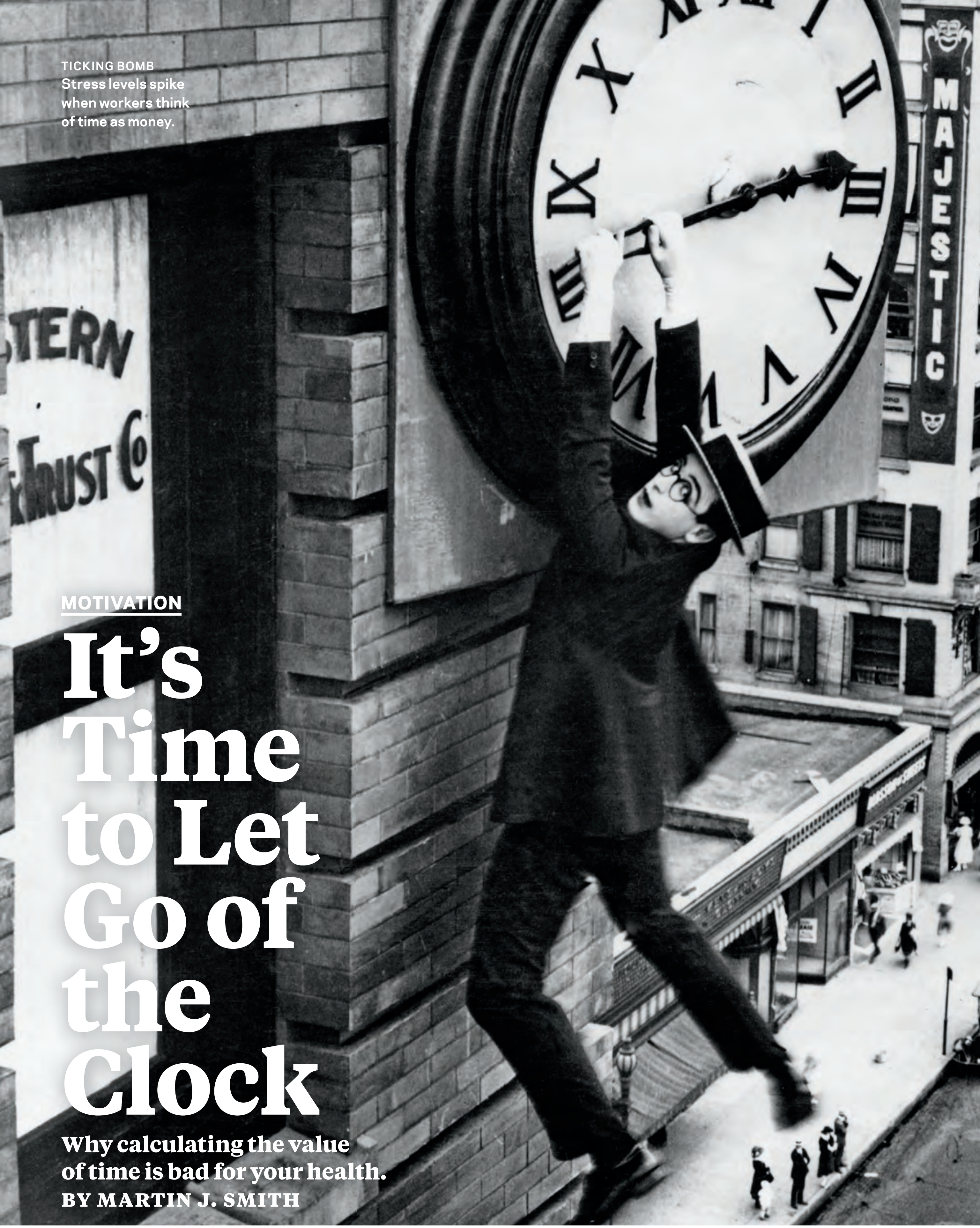
"Communication structures **serve as scaffolding** for our messages."
— **Matt Abrahams** PAGE 12

Mike McQuade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TICKING BOMB
Stress levels spike when workers think of time as money.

MOTIVATION

It's Time to Let Go of the Clock

Why calculating the value of time is bad for your health.

BY MARTIN J. SMITH

American Stock Archive/Getty Images

Many years ago, when Stanford University switched to a new payroll software platform, professor Jeffrey Pfeffer of Stanford Graduate School of Business noticed something interesting when he examined his pay statement. Even though he is not paid by the hour, the statement displayed an hourly pay rate. Curious, the organizational behavior professor sought to understand how the university came up with that number. The answer: The hourly pay was his annual salary divided by 2,080 — 52 weeks times 40 hours per week.

What was even more interesting was his psychological response to that information. Confronted with reminders about the economic worth of his time, Pfeffer noticed that he came to think of time as money.

More than a decade later, Pfeffer remains passionate about the topic of the economic evaluation of time, and he has good reason. With former Stanford GSB doctoral student Sanford DeVoe, who now teaches at the Anderson School of

Jeffrey Pfeffer is the Thomas D. Dee II Professor of Organizational Behavior at Stanford GSB.

Management at UCLA, Pfeffer has done research showing that thinking of time as money changes people’s decisions about volunteering time and trading off working more hours for more money.

Pfeffer’s most recent research, coauthored with Dana R. Carney from the Haas School of Business at the University of California, Berkeley, demonstrates the physiological consequences of the economic evaluation of time. Their study concludes that people who are keenly aware of the economic value of their time — people who think of time as money — generally are more psychologically stressed and exhibit higher levels of the stress hormone cortisol than do people for whom the economic value of time is less salient.

Pfeffer and Carney were inspired by previous research on this topic, including a 2001 study by M. Cathleen Kaveny, now at Boston College. Kaveny studied why lawyers often are unsatisfied with their careers and sometimes leave the profession altogether, even though most of them enjoy high incomes and occupational prestige. She concluded that attorneys, whose time is accounted in billable minutes, are hyperaware of the ticking clock that rules their work lives. Even when they’re not working, they’re thinking about how much income they’re forgoing during off hours, such as while dining with friends or coaching a child’s soccer game.

To demonstrate the effects of the time-money awareness, Pfeffer and Carney recruited 104 test subjects and paid them to work for two hours for a fictitious company. They divided the recruits into two groups. Before they started the job, 50 of the workers were asked to calculate their per-minute pay rate based on earning $57.50 for two hours of work. The remaining workers were assigned the exact same tasks, but were not instructed to calculate their per-minute pay rate. In other words, both groups were guaranteed the same pay for the same two hours of work, but the first group proceeded with an upfront awareness of how much money they would earn per minute.

To test the physiological and psychological impact of that awareness, Pfeffer and Carney measured each subject’s salivary cortisol level — a physiological indicator of stress — at both the start and the end of their two-hour session. The results, Pfeffer says, were troubling. Cortisol levels were almost 25% higher in the time-is-money calculation group, whose members also seemed to find less pleasure during two breaks in the experiment in which they were allowed to look at art or listen to music.

“Cortisol is linked to all kinds of bad physical outcomes,” Pfeffer says. “A rise of almost 25% is a serious health consequence.”

Pfeffer says he finds that result particularly distressing given the way the American work culture has evolved.

> **“This calculation about what it costs to coach your kid’s soccer game is not a path to happiness.”**

With more workers piecing together incomes in the so-called “gig” economy, rather than being on a full-time payroll, they’re more aware than ever of Benjamin Franklin’s adage that time is money. “The stress-inducing aspects of these new work arrangements may have implications for overall population health,” the study concludes.

“We’re moving in the wrong direction in many ways, and this is only one,” Pfeffer says. “People are continually calculating the economic value of their time. And all the research shows that when people are thinking about time and money, they’re not enjoying their lives. They become impatient. They don’t enjoy music, or sunsets. This calculation of what it costs to coach your kid’s soccer game is not a path to happiness.”

So why should employers care about the stress levels of their workers? Pfeffer’s study suggests three reasons: Health care costs are a significant burden on both society and employers, employee health affects productivity, and people’s health status is a reliable indicator of how well a social system is functioning.

But beyond that, he says, “We ought to care as much about people as polar bears. A lot of companies, particularly the big ones, talk about how much carbon they’re saving and how much packaging they’re saving. I certainly believe the physical environment is important. But the human environment is important as well.”

Pfeffer suggests employers look for ways to mitigate the time-is-money mentality, including moving toward annual salaries rather than hourly pay scales. “Every minute thinking about the value of your time is not very good,” he says. “We live in a completely overscheduled world, and that’s just not very healthy.”

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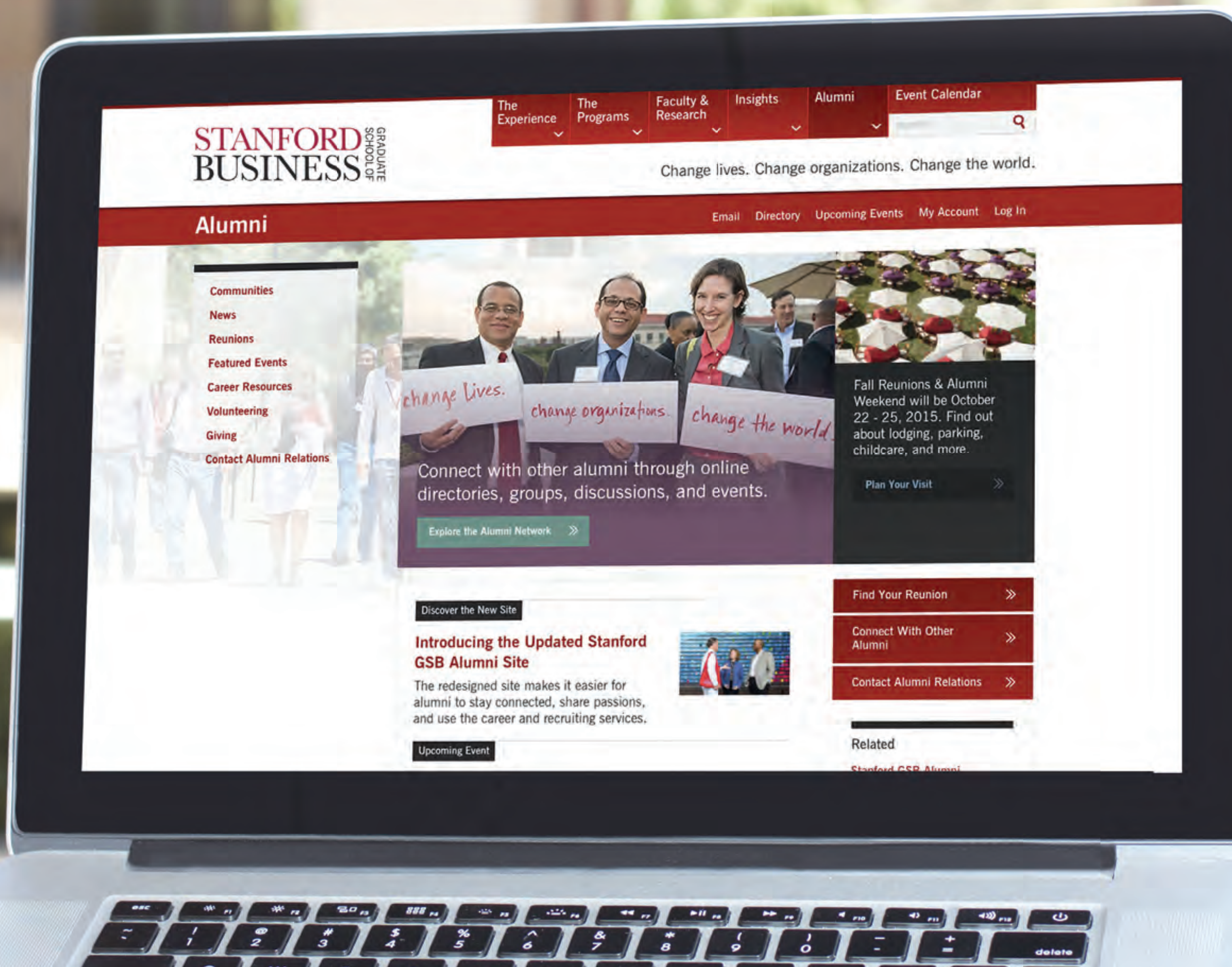
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Introducing the Updated Stanford GSB Alumni Site

The redesigned site makes it easier for alumni to stay connected, share passions, and use the career and recruiting services.

COMMUNICATION

Three Questions You Should Always Ask

From small talk to job interviews, here's how to communicate clearly in any conversation.

BY MATT ABRAHAMS

How many different communication actions do you engage in during a typical 15-minute stretch?

I asked my students and consulting clients in an informal poll, and the results surprised me. My "subjects" were engaging in up to five different types of communication actions in this short time period — and I wasn't even counting texts or emails.

From answering questions to initiating small talk, from introducing people to each other to providing feedback, we all find ourselves needing to adeptly manage different types of communication. This nimbleness, when paired with social expectations of appropriateness and efficiency in our communication, can be quite daunting to even the most experienced.

The key to managing these different types of communication is to leverage structures. Communication structures serve as scaffolding for our messages. They allow us easy starting points, transitions, and clear endings. They help us to be concise and relevant. Finally, research evidence exists that structured information is more easily processed and remembered by our audiences.

While many structures exist, I have found one structure reigns supreme in applicability and simplicity: The "What? So what? Now what?" structure must be part of your communication toolkit.

This structure is logical and clear. Let me break it down:

WHAT?

First, define or describe your key ideas or arguments. Do so in a clear, concise manner devoid of jargon and flourishes. Ask yourself, "What are the critical few bits of information that I need to convey to maximize fidelity?"

SO WHAT?

This second part has you focusing on the relevance of your ideas or arguments to your audience. You must be sure to take your audience's perspective into account. Remember, if you are to maximize fidelity and remembering, it's less about what you want to say and more about what your audience needs to hear. Say to yourself, "The bottom line for you (my audience) is …"

NOW WHAT?

Finally, your last part highlights the thoughts, feelings, and actions you wish your audience to hold or enact. Be clear and direct in how you phrase these so as to reduce ambiguity. Be cognizant of the tone you use to convey this information. Your tone (e.g., sense of urgency, confidence, excitement, etc.) directly impacts your audience's perception of both you and your message.

At the highest level, the "What? So what? Now what?" structure affords you cognitive bandwidth because it provides you with how you intend to convey your messages so you can focus on the specific details of what you wish to say. With practice, you can learn to manage the barrage of communication situations you face by deploying this Swiss Army Knife of communication structures.

How does this structure look in practice? Here are some ways you can employ this technique.

Q&A

Questions are a great opportunity to deploy this structure. For example, imagine a job interview where you are asked, "Why are you qualified for this job?"

What? I have over 12 years of experience in customer-facing work addressing challenges such as migrating to new systems and implementing new processes.

So what? These previous experiences will help me provide your customers with high-quality results, while also assisting you to streamline your deployment process.

Now what? I'm happy to have you discuss my qualifications with some of my former clients.

FEEDBACK

I often coach clients who need to provide constructive feedback to leverage this structure. For example, you have

Matt Abrahams is a lecturer in organizational behavior at Stanford GSB.

Typography by Elyanna Blaser-Gould

WHAT? SO WHAT? NOW WHAT?

a colleague who failed to complete his report on time.

What? I've noticed that your report was not submitted within our agreed upon timeframe.
So what? This puts us at a disadvantage for practicing our pitch and might jeopardize our client meeting.
Now what? I need for you to complete this report by tomorrow morning. Please let me know what I can do to assist you.

INTRODUCING SOMETHING OR SOMEONE

Introductions can often ramble and confuse. Using this structure can help you be clear and set expectations for what is to come.

INTRODUCING SOMETHING

What? I am excited to introduce the latest version of our product. In this release we've added many usability enhancements and improved our speed.
So what? Now our clients can more easily complete their tasks and save time and money.
Now what? When you leave this conference session, please install it today.

INTRODUCING SOMEONE

What? I am honored to introduce Dr. Jonas Smith, who is here to discuss her insights into game theory.
So what? Her work has changed the way many people go about making daily decisions. I am certain you will think differently when you leave here tonight.
Now what? Without further ado, join me in welcoming Dr. Smith.

MAKING SMALL TALK

Many of us struggle to engage in small talk, especially with people we don't know well. This structure can help you to engage and sustain initial conversations. Simply use the three questions to get your targets to express themselves.

What? What do you know about the latest attempt to reduce energy consumption?
So what? Why do you think it is so important to reduce energy?
Now what? What can I do to help reduce my energy use? ▲

CAREER

How Referrals Impact Employee Diversity

Being connected not only helps minority candidates find jobs but also affects promotions.

BY DYLAN WALSH

Sending a job application blind — by email or through some nameless online portal — feels a bit like stuffing your résumé in a bottle and dropping it into the nearest body of water. The crush of candidates makes it unlikely that you'll even be considered.

That helps to explain why up to 50% of all jobs in the United States are found through social contacts. Referrals give applicants a way to skip the line. They also, theoretically, create a more efficient application process by presenting employers with informally vetted candidates and employees with a workplace that will likely be a good fit.

The downside is that "birds of a feather flock together, and network-based hiring could exclude people who are not as well connected," says Adina Sterling, an assistant professor at Stanford GSB. Minorities and women — precisely the kind of people who, historically, are not as well connected — may be at a disadvantage when it comes to finding a job through social networks.

"But is that the full story?" Sterling asks. "If network-based hiring is a negative for certain groups at the point of entry, does that effect continue through their tenure within the organization?"

An article coauthored by Sterling and published in *Industrial and Labor Relations Review* in January uncovers a surprising result: Referrals can actually boost the rate at which black employees are promoted and even lift the promotion rates among black employees high enough to match the rate among their white peers who were not referred under promotions of certain types; however, the effect does not hold for women.

In partnership with Tulane University's Jennifer Merluzzi, Sterling investigated 11 years of personnel records on nearly 16,000 employees hired at a U.S.-based sales organization. They tracked promotions of blacks and women, two groups that are typically promoted at lower rates than whites and males, and differentiated between those who were hired from a referral and those who were not. They found that black employees hired through a referral were 1.2 times more likely to be promoted than those who were not. However, this did not bring them to parity with white employees. In some rare cases, employees who demonstrated extraordinary ability were given so-called "outstanding promotions" — they were promoted earlier than their colleagues. In these cases, Sterling and Merluzzi found that black employees with referrals were promoted at the same rate as white employees without referrals.

Women, meanwhile, were largely unaffected by referrals when it came to promotion. "That really surprised me," says Sterling. "These results clearly speak to the idea that gender and race are different. They suggest that there are distinctive potential biases that occur when women are hired and promoted as opposed to racial minorities."

To understand why referrals increased promotion among blacks, Sterling and Merluzzi ran a small vignette in which MBA and executive MBA students, told to role-play as managers, were split into two groups. Each group received a hiring report and a résumé that was identical except for the race of the employee (one white, one black). Within these two groups, some were told the employee under review was a referred hire while others were told he was brought in through a campus recruiter. They were given a glimpse of his performance — and told that other employees with the same performance were dismissed half the time and promoted half the time — and then they were asked whether to fire or promote him.

Sterling and Merluzzi found evidence that black employees who were referred were the most likely to be promoted, and they were statistically more likely to be promoted than whites who were not referred. When the MBA and executive MBA students explained their rationale, they were more apt to use hard data to assess employee quality when evaluating black employees compared with white employees but were less likely to do so for employees who were hired by a referral rather than by formal methods. In other words, having someone to vouch for them and offer greater details "behind the quantitative numbers" was more important for black employees than for white employees.

For Sterling, this speaks to the possibility that black candidates face pervasive bias in the hiring process — that, from the outset, they are more heavily screened based on measurable criteria compared with other candidates. Referrals may help dismantle this tendency.

Sterling says women, meanwhile, may face more time-specific discrimination, related to starting a family, for instance. If this is the case, referrals offered at specific times may be more beneficial.

The nuance of these findings, Sterling says, speaks to the simple fact that "there is not one silver bullet here that you can walk away with. Hiring and retention with respect to employee diversity are complex problems." But she offers employers a place to start: At the minimum, track data on new hires, she says. Human resource departments sit atop massive amounts of useful information. Take a look at what each new hire pool looks like when brought in through different methods. If some pools are more diverse than others, or within those pools groups respond or perform differently post-hire, then track that.

"To the degree companies are serious about trying to diversify the labor pool in ways that allow people to be successful, HR managers should track these things, look at them, and then be open to surprising aspects of how referrals can help, especially underrepresented groups," Sterling says. "This is not just about hiring, but about retention and getting the most out of employees that you can." ▲

Adina Sterling is an assistant professor of organizational behavior at Stanford GSB.

Illustration by Edel Rodriguez

EDUCATION

When Famous Practitioners Become Teachers

The CEO of an online school seeks to democratize genius by recruiting celebrity experts.

BY ERIKA BROWN EKIEL

When **David Rogier** was in the second grade, he was whining about doing his homework when his grandmother told him a story that not only motivated him to get back to work, but also, many years later, inspired him to start an online school.

As a young girl living in Poland, she and her mother left town for a vacation while her father stayed behind to work. A week into their trip, they discovered to their horror that Nazis had invaded Poland, stolen all of their possessions, and sent her father to a Russian labor camp, where he later died. After the family fled to America, his grandmother tried to get into medical school but was repeatedly rejected. One admissions officer told her she had three strikes against her: She was Jewish, she was a woman, and she was an immigrant. But she kept trying until she was accepted into New York Medical College. She went on to become a pediatrician.

At the end of her story, Rogier's grandmother told him, "Education is the one thing in life that no one can ever take away from you."

In May 2015, Rogier and his friend Aaron Rasmussen launched MasterClass, which provides access to online classes from famous masters of various crafts, such as Annie Leibovitz on photography, Steve Martin on comedy, and Serena Williams on tennis.

Based in San Francisco, MasterClass has 40 employees and has raised $21 million in venture funding, Rogier says.

"Education is everything," says Rogier. "It was important to me to help other people have something no one can take from them." He talked with *Stanford Business* about his company.

What's the big idea behind MasterClass? What if you could learn from the very best?

How do you determine whom to invite to teach a class? We talk to experts in the field and ask them whom they would like to learn from. We also talk to students and survey people and ask them who they think are the best in the world. Then we analyze a bunch of statistics to figure out who'd be the best person to teach a particular class.

What makes them the "best person"? Our instructors all had someone in their life who changed their path for them. Kevin Spacey talks about the restaurant manager who convinced him to be an actor. Kevin was a waiter and performing in the park on weekends. His boss at the restaurant fired him and told him, "I saw your show in the park. You have what it takes to be a great actor. You should go do that." They all had someone who helped them and they want to help someone else. Also, they are all masters of their crafts. They've spent decades honing their skills, and they want to share that knowledge.

How do you compete with platforms like YouTube, where people can learn all sorts of things? Some of our teachers already have tons of other content out there, like chef Gordon Ramsay. But his MasterClass takes place in his home and he opens up his kitchen to teach you how to elevate your home cooking to Michelin-star level. You can't get that level of access anywhere else. Also, our classes go beyond video. We have forums and workbooks, and the instructors are engaged in the classes. Werner Herzog, the German screenwriter, is hosting a live Q&A with people in his class. James Patterson picked someone from his MasterClass to coauthor a book with him.

Who was the first MasterClass teacher and how did you convince him or her to do it? Dustin Hoffman was the first to say yes. I knew someone in his camp. As soon as he heard our idea, he said yes. He said it was because he'd worked with Laurence Olivier and Marlon Brando. They had a huge impact on him as an actor. He wanted to try to help young, new actors by sharing that knowledge.

Your courses feel more heavily produced than most online education content, but it isn't quite entertainment, either. Where do you see yourselves in that spectrum? We think of ourselves as an education company. A big part of our initial thought process was, "Why don't people finish a lot of online classes?" Many of the online classes that are available out there are shot with a webcam in the back of a classroom. Those people are taking a format and structure that was not made for the web and putting it up on the web.

Why can't an online class be the best acting class ever? I think about the stuff I do sit through and finish, and it's shows on Netflix and HBO. We're trying to set the bar for what online education can be. The best classes can be engaging and look nice and also make you laugh and cry. You cry watching Dustin Hoffman's class. In Christina Aguilera's class, you sing into your computer — we made a program that shows you your range so you can see when you're making progress.

Are most of your students doing this as a way to become qualified and find a job, or is this more for a hobby or general entertainment? There's a huge mix, but most of our students want to become the best they can at something, whether they're a professional or not. Half of them have never taken an online class before.

What would be your dream MasterClass? I'd love to get Elon Musk to teach a class.

Why? He has changed at least three industries. He sees into the future. He's great at understanding what the world is going to want in 10 years. I would ask him to explain how he got the ideas for his startups. I want to understand his mental process. The class would be on entrepreneurship, but the part that would be most interesting to me would be learning how he sees the future and then goes and creates it.

Who was your favorite teacher when you were a kid? There are a couple. I had

Photograph by Drew Kelly

DAVID ROGIER
"Combine diverse groups of people to get a wide range of ideas. Out of that, you get magic."

an English teacher in high school named Pam Felcher. She was from New York — tough and a fast-talker. I wrote an English essay and BS-ed my way through it. I got my paper back from her and she said, "Don't BS me again." She pushed me to get great insights and to write better. I had an economics professor in undergrad named John Nye. If I had the choice to hang with friends or go to his class, I'd pick his class. It always rocked my world. He helped us question a lot. Econ came alive with him. I still stay in touch with them.

What are your biggest challenges right now in building your business? Finding great people. We are trying to hire and we need to double in size. We are looking for people on the creative side, product, business development, marketing, and finance.

How do you come up with your best ideas? I have a team that is very creative. I learned as an intern at IDEO that I need constraints to be creative. IDEO's process of brainstorming was to build off other people. I try to create a culture and environment that encourages that. You combine diverse groups of people, such as engineers and marketers, say, in order to get a wide range of ideas. Out of that, you get magic.

What is the best business book you've read? *Why We Buy: The Science of Shopping* by Paco Underhill. It was written by one of the best market researchers of the past couple of decades. He focuses on finding new ways of understanding your target customer. If you do that, you find things you wouldn't have thought of in a board room or your office. You start to understand it isn't about what someone says but what actually drives them.

What do you think is the greatest innovation in the past decade? They aren't from the last decade, but spreadsheets are underrated. They literally created new professions. ▲

David Rogier earned his MBA from Stanford GSB in 2011.

BEHAVIOR

Humor Is Serious Business

You're not as funny as you should be, and your company is suffering because of it.

BY JOEL STEIN

You are not funny. I don't mean "you" in the generic sense, but literally you personally, because you're a businessperson. I, however, am funny. In fact, I'm so funny, I get paid for it. Not as well as you do for your businessing, but really well considering what I do is way less boring. I literally don't know how to use Excel, or even if people still use Excel, or if I'm misspelling Excel.

Statistically — which is the only way you people understand anything — it is highly probable that you used to have a sense of humor. Or even that you have a pretty good one when you're not doing businessy things. Recent Gallup data reveals that people laugh significantly more on weekends than on weekdays.

Further, this data suggests that as people get older, they stop smiling and laughing as frequently. This and other emerging research collected by Stanford Graduate School of Business professor Jennifer Aaker and lecturer Naomi Bagdonas, who co-teach a course on the subject, suggest that people fall off a "humor cliff" — both in laugh frequency and self-perceptions of funniness — around the time they enter the workforce.

This is a trend that Aaker and Bagdonas would like to see reversed, since humor is an effective and underleveraged tool for power, offering a competitive advantage against peers, higher retention rates of employees, innovative solutions, and teams that are more resilient to stress.

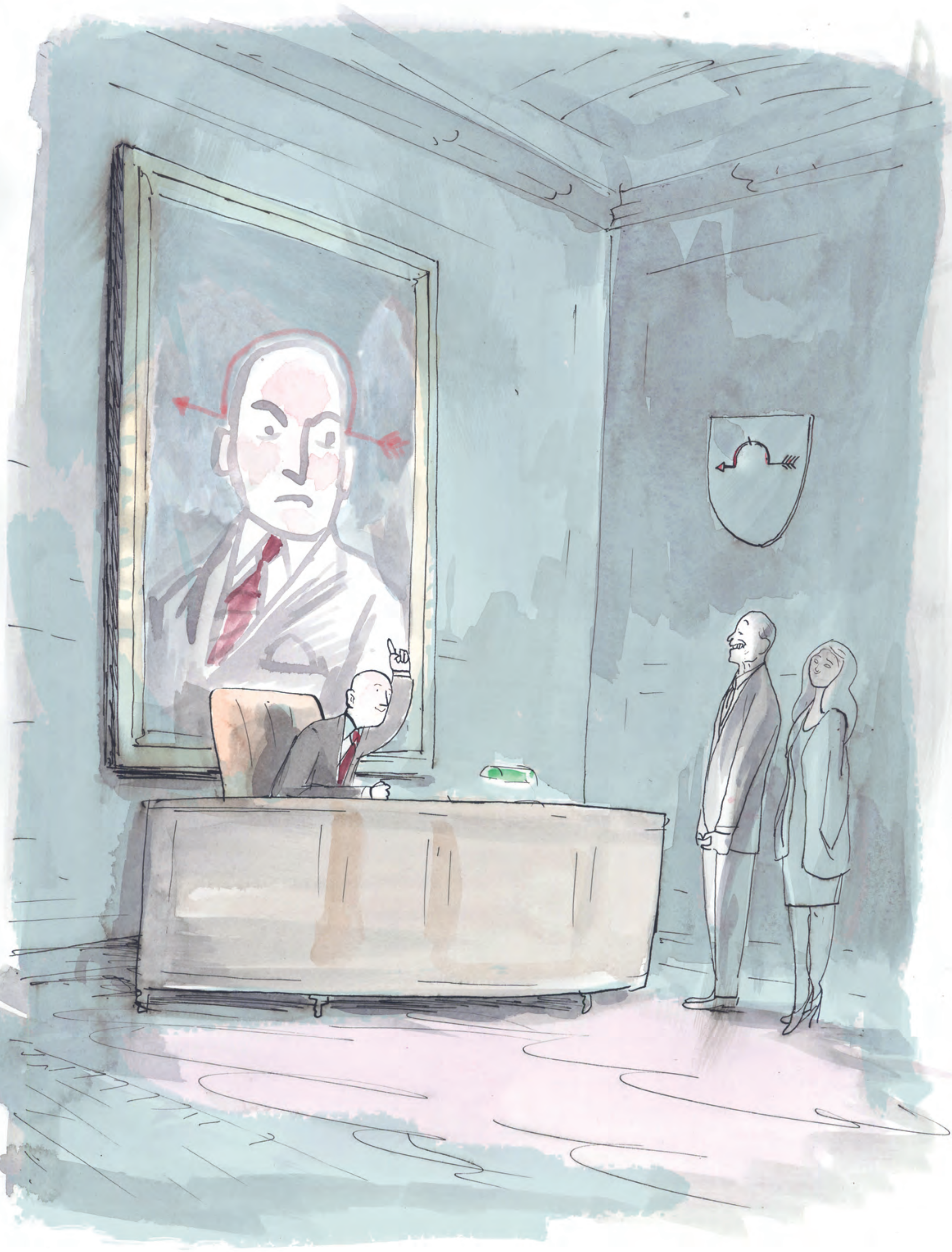
As a businessperson who doesn't have much time for reading because you have to go back to your businessing, you are probably wondering: Are there any contrived metaphors I can remember as a takeaway for how I can utilize humor in the workplace? Why, yes, there are: bridges and ladders.

Bridges are tools to build bonds, increase trust, and strengthen cultures. That is not what bridges in real life do, so a better metaphor might be "magnets" or "food," but we figured you businesspeople mostly skim and don't think too deeply about words.

Jennifer Aaker is the General Atlantic Professor of Marketing at Stanford GSB. Naomi Bagdonas is a lecturer in management at Stanford GSB. They co-teach the course *Humor: Serious Business*.

Joel Stein writes a weekly humor column for *TIME* magazine and was part of the editorial team for the *Humor: Serious Business* course at Stanford GSB. He graduated from Stanford in 1993.

Illustration by Graham Roumieu



The reason humor works as a bridge (just go with it) is that laughter sparks the release of oxytocin, a hormone that facilitates social bonding, increases trust, and quickens self-disclosure. This is key in a workplace since all the other ways to release oxytocin are no longer permitted by Human Resources. In a 2015 study, psychologists Alan Gray, Brian Parkinson, and Robin Dunbar had participants watch either a funny or neutral video clip before engaging in a self-disclosure exercise with a stranger: People who watched the funny clip revealed 30% more personal information relative to those who watched the neutral clip.

When it comes to nonstrangers, shared moments of laughter help facilitate closeness down the line. A 2007 study by social psychologist Doris Bazzini and her colleagues found that couples who recalled moments when they laughed together were more satisfied in their relationships than those who recalled positive memories that weren't funny.

But how can you, a businessperson who nonironically uses terms such as "leverage best practices" and "exploit core competencies," move the needle on your humor skill set? First, get good at self-deprecating, which is the opposite of everything you've ever done. Self-deprecation humanizes leaders, creates connections with employees, and makes people think the self-deprecator is even more powerful than she is: After all, if she can afford to mock herself, she must be confident in her abilities. It also signals to employees that they are allowed to be funny. Self-deprecation, however, can hurt your credibility if you're in a position of lower status in the organization.

If you are in a position of higher status or early in your relationship, it's best to avoid jokes that are aggressive (roasts, teasing, mocking); it is worth noting that Don Rickles never held an office job. Instead, use humor to highlight shared viewpoints or common enemies.

And don't ever punch down by making an employee the butt of your joke. Instead, punch yourself. During a visit to Aaker and Bagdonas's class, Hiroki Asai, former head of marketing communications at Apple, told the story of how he challenged himself to make all 1,000 employees laugh during every all-hands meeting. Once, he purposely showed up late to a meeting and then had a colleague play footage of him asking the beloved cleaning woman for advice on how to run the company. At the end of the video, she slapped him in the face and told him to get a grip; she became the hero of the group and Asai's foil in many videos to come.

So how can you keep a pulse on what's funny? "The best meritocratic part of comedy is that people either laugh or they don't," said Seth Meyers, host of *Late Night with Seth Meyers* and former head writer at *Saturday Night Live*, when speaking with the class. While this is the case in the comedy world, it isn't always the case in business; especially as you get more senior in an organization, lower status employees may laugh out of social deference, rather than genuine appreciation for your sense of humor. That's why Meyers advised the students to "get good at knowing the difference between your real laugh and polite laugh. Once you recognize it in yourself, you can identify it in other people."

If you're not funny — which, to be clear, you are not — have no fear. All you need to do is figure out who in your organization is funny and encourage them. Call them "humor ambassadors," in order to ruin the experience for everyone. Empower them to take on rogue humor missions and help you create more bonded and resilient teams in the process.

Ladders are not the opposite of bridges, or one of the first things you think of when you think of bridges, but, again, go with it. Unlike bridges, ladders are ways to use humor to increase your status, or decrease someone else's. Studies conducted in 2016 by Brad Bitterly, Alison Wood Brooks, and Maurice Schweitzer showed that if you are able to land a joke in a professional setting, your colleagues are more likely to view you as competent and attribute higher status to you.

But landing a joke requires knowing your style. Leslie Blodgett, the founder and former CEO of bareMinerals, explained, "People want authenticity. If you're not a joke teller, don't practice joke telling. Practice being yourself." And don't show your cards too soon. Anne Libera and Kelly Leonard, who hail from Chicago's legendary Second City improv theater and trained talents like Tina Fey, Stephen Colbert, and Jordan Peele, ran a workshop in the class and emphasized the element of surprise, saying, "The minute you announce that something is going to be fun — it is over."

> **"Don't ever punch down by making an employee the butt of your joke. Instead, punch yourself."**

One of the more surprising and effective places for humor is around the negotiations table, where humor can make you more persuasive. In a study by researchers Karen O'Quinn and Joel Aronoff, participants negotiated on the purchase price of a piece of art. When the sellers concluded their final offer with the humorous line "… and I'll throw in my pet frog," participants in the study granted 18% more concessions than in the control condition, thereby demonstrating that you should not run a psych study with 10-year-old boys.

Humor also increases power through memorability. Venture capitalist David Hornik, who's a general partner at August Capital, argued that most board meetings "run the spectrum from tedium to sadness, so if someone is willing to take the risk to create some levity, there is incredible value in that. People remember it." Biologist and author John Medina agrees, noting in his book *Brain Rules* that "the brain doesn't pay attention to boring things." In addition to oxytocin, laughter releases dopamine, which aids in memory and information processing.

Humor can help you land your dream job as well. A survey of more than 700 CEOs by Hodge-Cronin and Associates showed that 98% of CEOs prefer job candidates with a sense of humor and 84% think that people with a sense of humor do better work. Dwight Eisenhower said, "A sense of humor is part of the art of leadership, of getting along with people, of getting things done."

If Dwight David Eisenhower, the second least naturally funny president after Franklin Pierce, thought humor was necessary to beat Nazis, build highways, and warn against the military-industrial complex, then you better learn it too. So build a bridge, climb a ladder, mix a metaphor, and use the most obvious tool that everyone else is afraid to touch. And if it does get you fired, please let Jennifer Aaker and Naomi Bagdonas know. They're working on a study that's not finished yet. ▲

Organizations

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“Some unicorns have made such generous promises to preferred shareholders that their

common shares are nearly worthless.”

— **Ilya Strebulaev** PAGE 22

Mike McQuade

FINANCE

Why Are So Many "Unicorns" Overvalued?

Research finds huge discrepancies between the purported and actual value of more than 100 startups.

BY SHANA LYNCH

Unicorns were once considered rare. Now, the United States is home to more than 100 of these venture-backed companies, each worth more than $1 billion.

But are these magical beasts really dressed-up ponies? New research from Stanford GSB professor Ilya Strebulaev shows that such companies report values on average about 51% above what they are really worth. And some, including solar company SolarCity and financial technology company Kabbage, are more than 100% above fair market value.

THE BLACK BOX OF MARKET VALUE

Determining a startup's worth can be a challenge. Many are fast growing and unprofitable, and almost all have complex financial structures. They raise funding in multiple rounds, offering investors different restrictions and protections, and therefore stock pricing. The average unicorn, the researchers note, has eight stock classes for different types of investors, including founders, employees, venture capitalists, mutual funds, and others.

Because of that complicated structure, valuation is often based on the latest series' price, applied to all outstanding shares.

But that doesn't accurately reflect the preferred treatment some investors might get, the researchers say. In some series, for example, investors are promised 1.5 to 2 times their money should an initial public offering (IPO) fizzle. In that case, other shares can be worth far less.

"Some unicorns have made such generous promises to their preferred shareholders that their common shares are nearly worthless," the researchers note.

Ilya Strebulaev is the David S. Lobel Professor of Private Equity at Stanford GSB. Sauder School of Business professor Will Gornall earned his PhD in finance from Stanford GSB.

Illustration by Alvaro Dominguez

> **“Our model is designed to produce fair value estimates that are better proxies for expected value at exit.”**

One example is SpaceX, which raised a round in the recession of 2008 after several of its rocket launch attempts failed. It promised investors twice their money back and first in line should the company liquidate. At those rosy terms, investors sank more money into the company, which raised its valuation.

A MORE ACCURATE VALUATION

To resolve these issues, Strebulaev and coauthor Will Gornall, a professor at the Sauder School of Business, created a model that could take into account each contract’s terms, analyzing the different modifications to see how they would affect valuation. When Strebulaev and Gornall applied their model to Square, a payments startup that was valued at $6 billion, they estimated a value of $2.2 billion. The company went public in 2015 at a pre-IPO value of $2.66 billion.

“Our model is designed to produce fair value estimates that are better proxies for expected value at exit,” the researchers note.

The model can be applied to any startup, but for this study, “Squaring Venture Capital Valuations with Reality,” they focused solely on startups worth more than $1 billion. They used corporate legal filings and commercial Venture Capital data sets to study 116 unicorns. They limited their research to companies founded after 1994 that had raised a round after 2004.

Strebulaev and Gornall found that 53 of the 116 unicorns lost their unicorn status when they applied their model. All the companies were overvalued, and 13 were overvalued by more than 100%.

WHY FAIR VALUE MATTERS

Interest in venture capital as an investment vehicle is growing. Large U.S. mutual fund providers, including Fidelity and T. Rowe Price, have started investing in unicorns, and the past three years has seen a 10-fold increase in VC-backed investments. The rise of third-party equity marketplaces has allowed mom-and-pop investors to join the game as well. And in Silicon Valley, many young workers take small salaries and large stock options, betting on a successful IPO.

But the researchers note that even the most sophisticated finance professionals equate fair value and post-money valuation.

“We hope to make different constituents of the VC industry — founders, employees, investors, regulators, and consultants — aware of the issues with interpreting the metrics traditionally used in the industry.” ∆

HOW TO PRICE A UNICORN

How do people get billion-dollar values on fast-growing yet unprofitable startups?

A startup sells shares to raise money. This can occur in multiple rounds, and each round can promise its investors a different deal.

Currently, most financial professionals take the stock price from the last funding round and apply it to all outstanding shares.

Take Square. After its last round, a Series E priced at $15.46 a share, it was valued at $6 billion:

$15.46 Series E shares
× all outstanding shares
and unissued options
= $6 billion

But that valuation doesn’t take into account the special promises investors in that round were guaranteed. Those investors were promised their money back plus some should an IPO fail to deliver a great return for them. That meant less money for common shares.

Using Strebulaev’s model, Square was actually valued at $2.2 billion. That more closely aligned with Square’s value when the company went public at a pre-IPO value of $2.66 billion.

MOST OVERVALUED UNICORNS

These companies were the most overvalued unicorns after their latest round of funding, according to research by Stanford GSB professor Ilya Strebulaev. He examined 116 U.S. companies that were founded after 1994 and that received funding after 2004.

Company	Valuation	Fair Valuation	Difference
Better Place	$2.3B	$800M	196%
Box	$2.6B	$900M	195%
Datto	$1.0B	$300M	205%
Demand Media	$1.2B	$400M	188%
Good Technology	$1.2B	$500M	155%
Kabbage	$1.0B	$400M	138%
Nutanix	$2.0B	$800M	156%
SolarCity	$1.9B	$600M	188%
Square	$6.0B	$2.2B	171%

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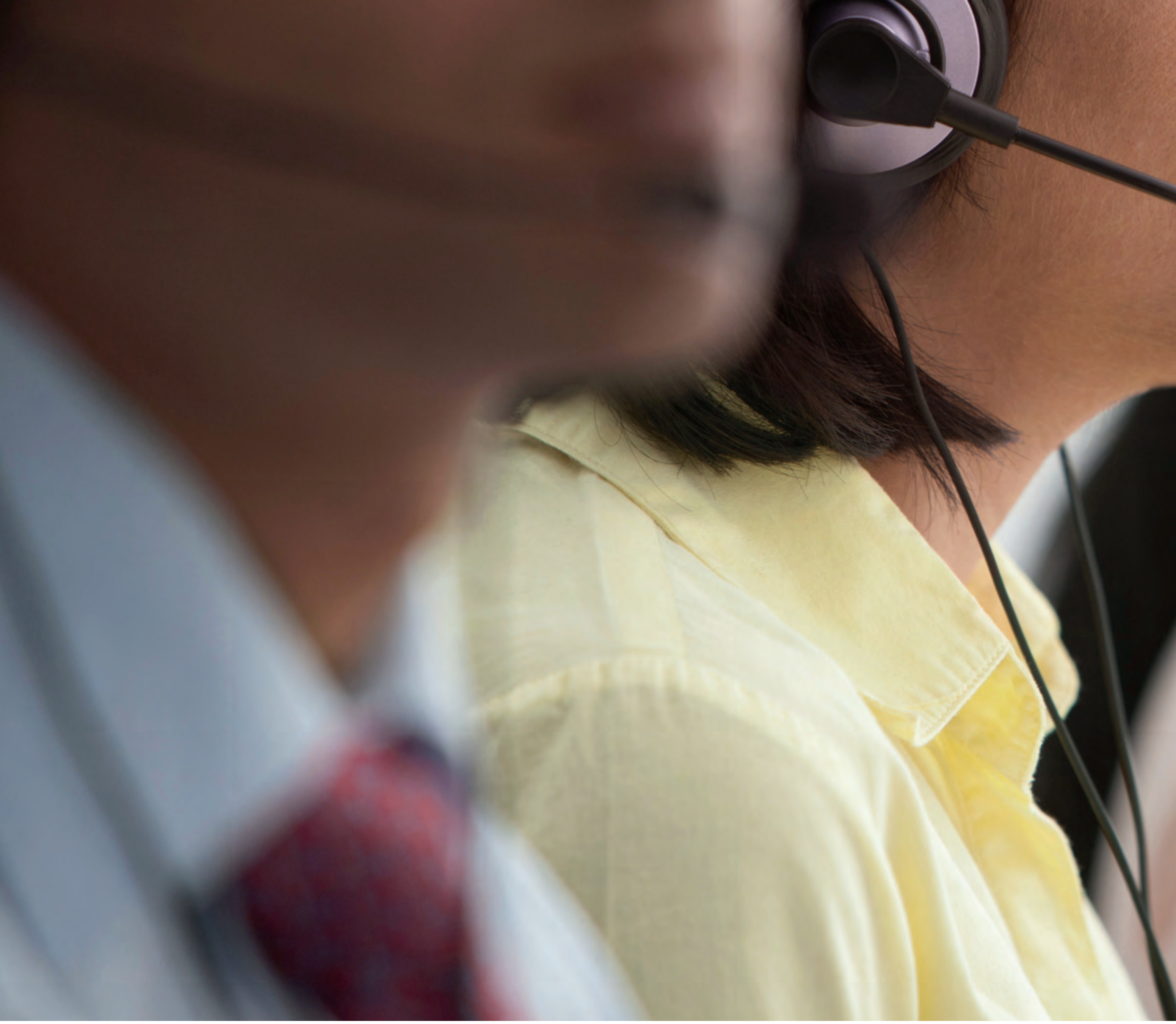


ImagesBazaar/Getty Images

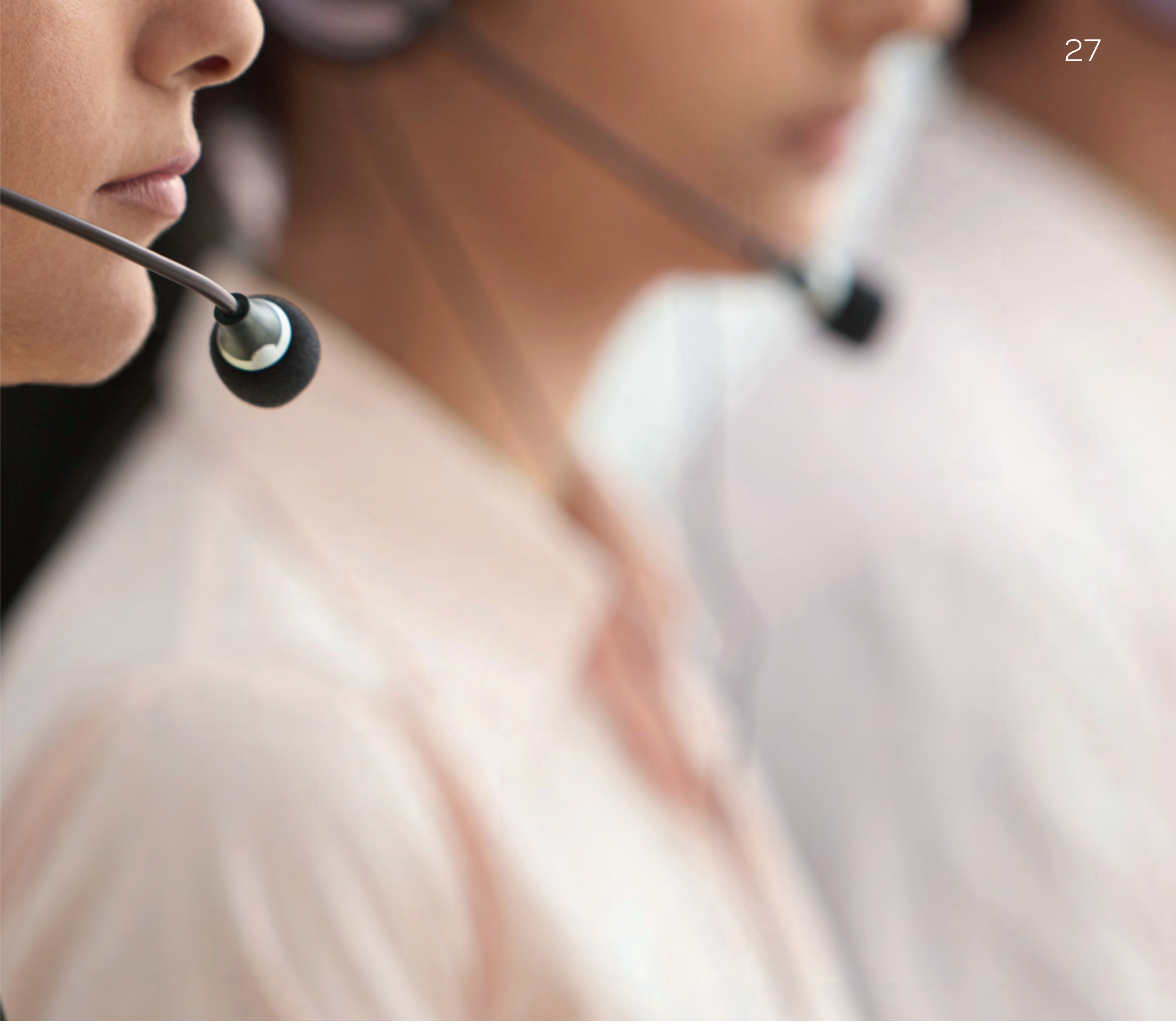
SYSTEMS

Organizational IQ and the Evolution of Intelligence

As technology accelerates the flow of information, businesses have a new role model: computer networks.

BY HAIM MENDELSON

In the late 1990s, I developed, together with my Stanford research team, the concept of organizational IQ, along with a way to measure it and a methodology for improving it. At the time, managers were already experiencing accelerating development cycles; intensifying global competition; and increasing demands from consumers, investors, and regulators. Greater connectivity, faster processing speeds, improved software, and more integrated information flows meant that managers in all industries were bombarded with new information as it became available — anywhere, anytime. These trends continue to redefine the meaning of organizational intelligence today.



FEEDBACK LOOP **These days, customer-service centers can influence product design.**

At the time, technology was still in the early stages of exponential growth. Smartphones did not exist and GPS technology was just beginning to become commercially available. The few organizations that experimented with artificial intelligence failed to achieve the desired benefits; as a result, even fewer organizations opted to use AI. Yet firms and entire industries were struggling with the management of information — while a few leaders were exploiting it to their advantage. At the time, I argued that to cope with and take advantage of the acceleration of clock speeds and information flows, organizations had to improve the effectiveness of both their *digital* and *organizational* nervous systems, which I measured by what I called organizational IQ. A key point I made at the time was that the digital and organizational nervous systems were complementary and integrating them was crucial for success.

The research that led to the organizational IQ concept built on an information-processing model of the firm. I viewed the design of an integrated organizational architecture as being analogous to the design of a system of networked computers, with processing being performed by *both* digital and human information processors. These processors engage in integrated feedback loops whereby they collect information from the external environment and match it with human knowledge and computer-based data to make quick and effective decisions. They move along two feedback loops: an *action* loop, which translates available information into action, and a *learning* loop, which uses new information and experience to

Haim Mendelson is the Kleiner Perkins Caufield & Byers Professor of Electronic Business and Commerce, and Management at Stanford GSB.

improve the organization’s perception and understanding of its ever-changing environment.

Building on the analogy to networked computers, the challenge (in simplified terms) is to design an “organizational network” for effective information management.

Just like a computer network, the system first needs to have sensors, or receptors, that receive inputs from the outside world and feed them into the network. It also needs processors (human decision makers and computers) to assimilate the information and quickly translate it into effective decisions, along with design principles to distribute decision making. The system needs a way to effectively store and share its information so decisions take advantage of its total knowledge base rather than have each decision maker (processor) limited to its own local data. It also needs to reduce processing bottlenecks — otherwise, it will suffer from information overload, leading to ineffective decisions and late response. Finally, rather than view the organizational network as a stand-alone, self-contained, closed system, it should operate as part of a larger collection of interconnected networks. This extends the concept of interoperability from digital to organizational nervous systems: Systems that were designed for different organizations should be able to work together to accomplish a common goal (or at least a degree of alignment).

Along with my research team, I translated these ideas into performance metrics that measured the information-management effectiveness of organizations and found, in a series of papers, that the resulting measure of organizational IQ was a strong predictor of business success.

If anything, our work from the late ’90s underestimated the importance of organizational IQ. By now, the key drivers of change have accelerated and their effects have been dramatically amplified. Clock speeds have advanced to the point where actions that once took weeks or hours can now be accomplished in seconds. At the same time, the Internet of Things, advanced analytics, and artificial intelligence have increased the scope, power, and speed of computer-based knowledge management and decision support. As a result, digital nervous systems have moved to the forefront, driving an increasing number of action loops in wide-ranging areas — from automated trading systems to self-driving cars and on to supply chain management. Significantly, digital nervous systems are playing an increasingly important role in the *learning* feedback loop as well.

> **“Clock speeds have advanced to the point where actions that once took weeks or hours can now be accomplished in seconds.”**

We can see these effects in action by focusing on the simple example of customer service (see infographic, page 29). Traditionally, customer service took place at call centers with an emphasis on solving customer problems quickly and effectively. Agents were evaluated on average hold times on the phone. In contrast, the organizational IQ perspective views customer service as a competitive differentiator: Not only does it play a role in creating a superior customer experience, but it also serves as a key input to the learning loop that enables the firm to improve customer journeys and product design and to identify new trends. We recommended that, rather than get customers off the phone, organizations increase the value generated by each customer touchpoint, both for the customer initiating the contact and for all future customers. In other words, effective customer service integrates the action loop and the learning loop.

Over the years, leading firms have adopted this point of view. Still, their learning loops were largely human, supported by systems that aggregated and presented information for decision support. Technology is increasingly taking our approach to the next level, with computer-based intelligence playing a key role in both the action loop and the learning loop. Computer-based intelligence improves productivity while reducing the lag between learning and action, aggregates information from multiple sources at the speed of light, turning some organizational problems into engineering problems. It enables the effective delegation of operations such as customer service to best-in-class players, while capturing the benefits of the learning loop.

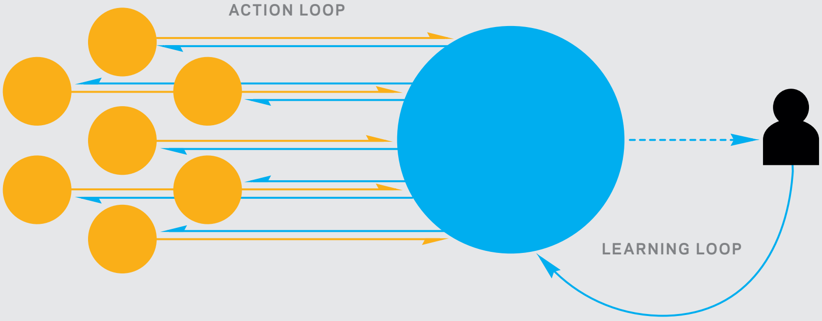
With the digital nervous system gaining ground, the role of organizational nervous systems is moving away from execution and into business model design, strategy, and control. On the one hand, the increasing capabilities of artificial intelligence create a need for designing and evaluating new business models — something that automation is not good at today. On the other hand, I have argued that business models will evolve to the point where they will be reconfigurable through the intricate interaction of automated agents. We’ll be watching how the boundaries between digital and organizational nervous systems change in the future. Δ

Infographic by Tricia Seibold

HOW CALL CENTERS HAVE EVOLVED

Customer service is no longer just about reducing call-holding times; it's about analyzing input and improving products.

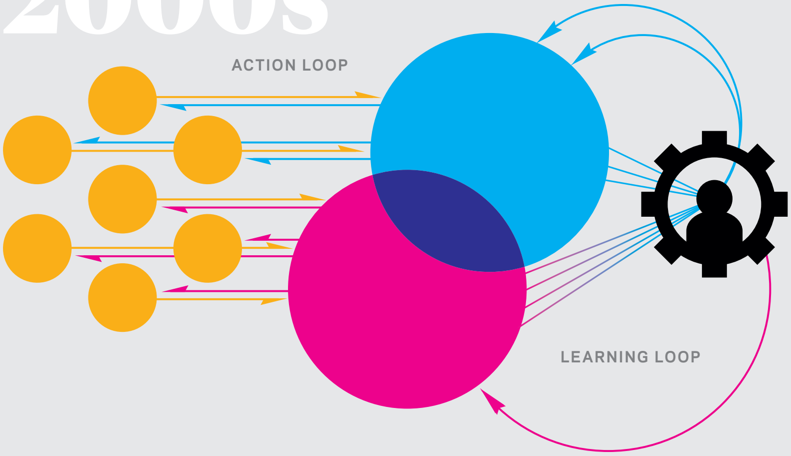
1980s



TRADITIONAL CUSTOMER SERVICE

In the pre-digital world, call centers were manned by people who took minutes (at best) to receive complaints and resolve specific issues. Viewed as a low-priority expense, the call center contributed little in helping the firm actually learn from customer feedback.

2000s

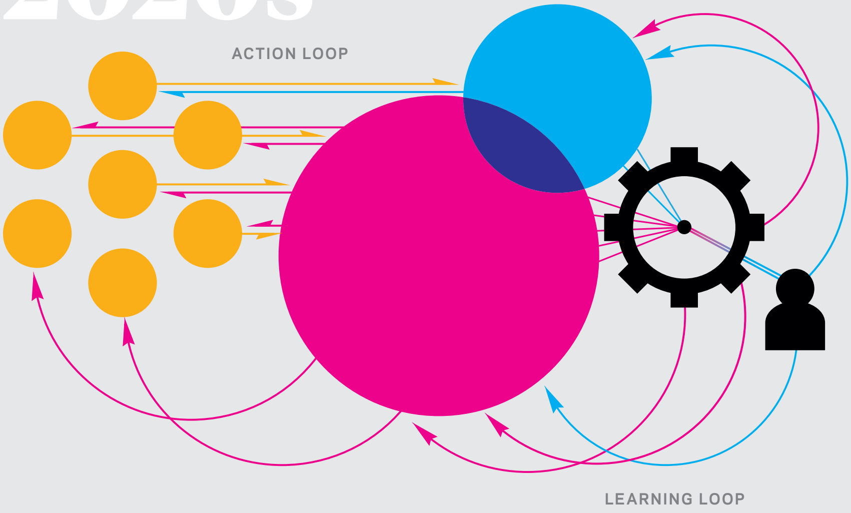


HIGH-IQ CUSTOMER SERVICE

As they became increasingly automated, call centers began to integrate multiple touchpoints to create a seamless customer experience. Technology reduced response times to seconds for computer-based support and to minutes for services that required a human touch.

Information gleaned from the customer journey — through both automated and human analysis — was used to improve products and processes. This had the potential to create a competitive advantage but could take months.

2020s



HIGH-IQ CUSTOMER EXPERIENCE

In the future, while the underlying paradigm of the high-IQ organization will remain the same, new technology will dramatically improve the speed and efficacy of so-called "call centers," which will rarely involve actual phone calls.

Increasingly granular data and ever-improving algorithms will enable the firm to anticipate and prevent problems before a complaint materializes. Most customer service issues will be resolved in the background. When a customer explicitly requests a service, the response will be provided in real time or forwarded to the appropriate person.

The process of using customer feedback to improve products will become increasingly automated through the application of machine learning. Time scales for such improvements will be compressed from months to hours, minutes, or even seconds.

● Customer ● Human ● Automated

TECHNOLOGY

Guardians of Low Earth Orbit

An entrepreneur is helping the commercial space industry navigate a zero-gravity obstacle course.

BY MARTIN J. SMITH

So much junk is floating around in low Earth orbit (LEO) that NASA occasionally has to reroute the International Space Station to avoid collisions and at least once herded the crew into the attached Soyuz spacecraft in case the orbiting scientists had to escape when the station was in the path of onrushing debris.

Of the estimated 500,000 debris pieces larger than a marble — nonfunctional spacecraft, abandoned launch vehicle stages, mission-related and fragmentation debris — more than 20,000 are larger than a softball. They travel at speeds up to 17,500 mph, fast enough for even untraceable flecks of paint to damage a satellite or a spacecraft. The risks from collision will only get worse as new scientific missions, commercial constellations, and manned spacecraft enter service in LEO.

Alan DeClerck, who received his MBA from Stanford Graduate School of Business in 1985, began working last year with Menlo Park-based startup LeoLabs to help the commercial space industry navigate that high-altitude obstacle course. His partners in the new venture include former engineers and radar scientists from SRI International, a large research lab that spun off LeoLabs as a commercial enterprise.

The company's two completed radar arrays in Alaska and Texas track more than 1,000 objects per hour, and its partners and customers access that data through a LeoLabs software platform. The company plans to build four more debris-tracking radar facilities near the equator and the polar regions by 2019.

"There's a gold rush to put new satellite services up there, but the question is how can we secure these services against a backdrop of manmade debris moving at 17,500 mph?" says DeClerck, who is the company's vice president of business development and strategy. "Achieving what's known as space situational awareness is critical for defense, communications, and human space flight."

We asked DeClerck for an overview of the startup's launch.

How did the idea for LeoLabs come about? Nearly a decade ago, a couple of our founders working at SRI got a National Science Foundation grant to build this radar array near Fairbanks, Alaska, to help study the ionosphere. Mixed in their scientific data was unexpected "noise," which turned out to be the debris flying in low Earth orbit. That's when they realized there's a lot of value in being able to detect and track that debris, because that area between 400 and 2,000 kilometers [250 and 1,250 miles] above the planet is critical for commercial services on Earth as well as for staging missions deeper into space.

So they spotted a commercial opportunity? Everybody wants this data. We're seeing interest because there's no one else doing what we're doing, and the timing is great because everyone is going into LEO with new services. Commercial firms need debris mitigation plans for their satellites. Government space agencies want the data for situational awareness and regulatory reasons. After launch, space debris is the number-one operational risk, and those operations are really important to the security of the country because so much of our security relies on satellites. There are billions of investment dollars at stake, so the market for us is considerable.

How does LeoLabs' mission differ from the NASA Orbital Debris Program Office at the Johnson Space Center? LeoLabs is a source of data. NASA takes advantage of multiple sources to manage and secure U.S. spacecraft and satellites. It also uses Air Force data from a public catalog of debris. The Air Force is helping the commercial industry because of a 2009 collision between a Soviet satellite and a U.S.-built commercial satellite that created thousands and thousands of pieces of debris. That highlighted the need for better collision-avoidance data. While our mission is commercial, we believe our data and services will be of interest across the space industry, even the insurance industry.

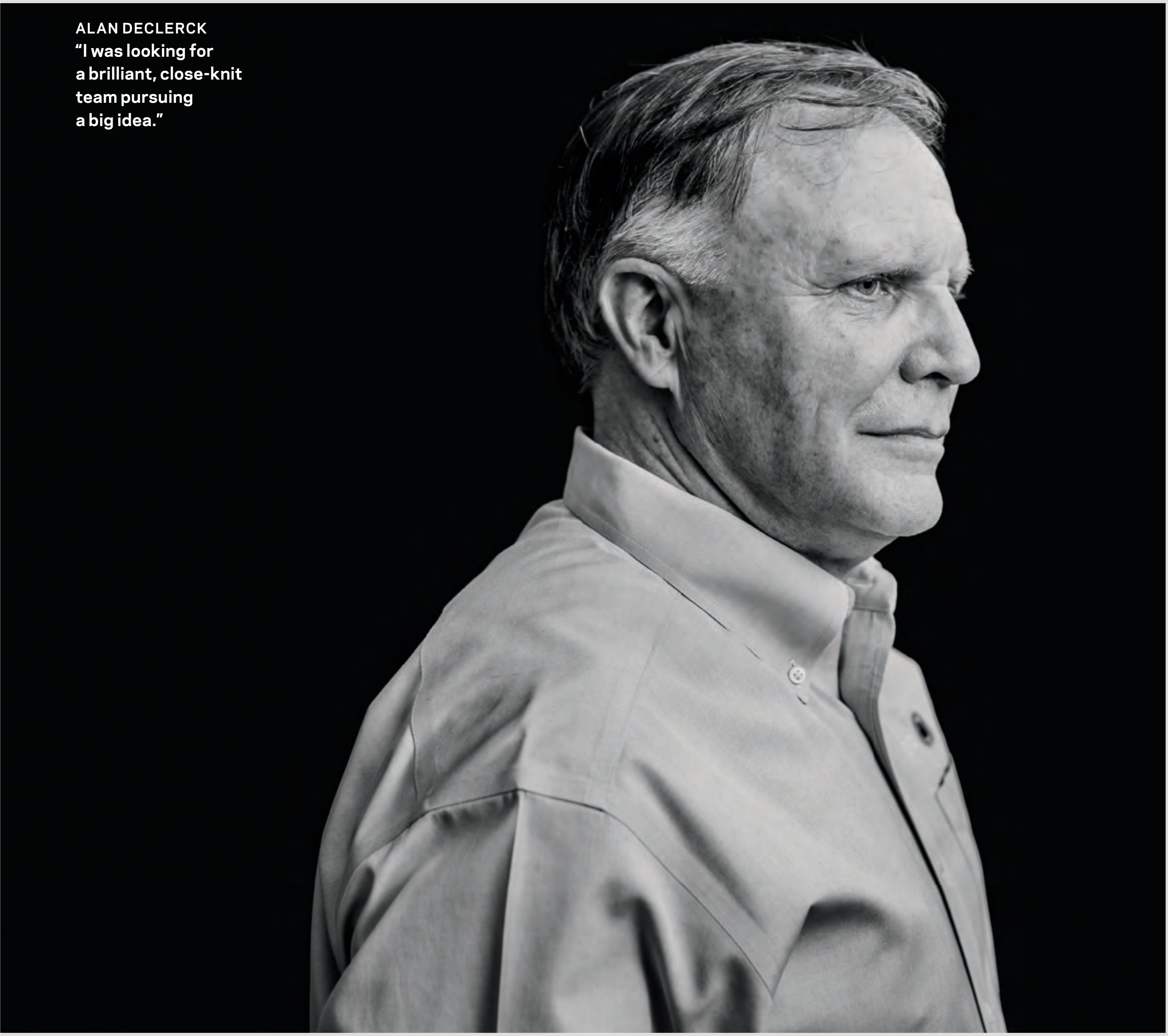
The insurance industry? Absolutely. What's driving the situation today is operational survivability. The big commercial space companies today are putting up entire constellations of satellites, and risk management shapes the investment climate. SpaceX is putting up 4,400 satellites. OneWeb is putting up almost 1,000. And you've got companies like Blue Origin that want to do human space flight. Those big entities have public shareholders, and they have a fiduciary responsibility to make sure conditions are safe and the risks are understood. So we're building the network that provides the ability to map space in LEO.

What unique startup challenges did LeoLabs face? Usually, it's the technical and execution risks that challenge startups. But we have long experience on the team, and the problem we're solving is clear. Even with our brilliant team, the challenge I noticed when I walked in the door was to articulate the big vision and to tell the market that we're doing foundational global mapping data for LEO.

Walk me through LeoLabs' venture funding process. Our first round of funding was $4 million, and for that we were able to build the Texas radar facility and put it up in six months within that budget. That certainly turned heads in the industry. We'll be going out for another round in the second half of this year. For the remaining stations, depending on where in the world we'll put them, those will also be in the single-digit millions. This is a whole new set of economics for the space industry.

Why do you need more tracking stations? The more stations, the more often you see things. If you see an object only once a week it's hard to project an accurate orbit, and you need it to be accurate because it has to be actionable for operators. With our Alaska

Photograph by Drew Kelly


ALAN DECLERCK
"I was looking for a brilliant, close-knit team pursuing a big idea."

and Texas sites we already cover 95% of the debris orbits. We'll get the additional 5% once we have the equatorial and polar stations up and running. Then we'll be able to see a quarter-million small objects every two to three hours, predict their orbit within 50 meters, and give actionable data to the satellite operators.

Then what? Then we have the opportunity to provide a data platform based on our data stream. And people can innovate in ways we can't even imagine. Remember when Google Earth first emerged? It was cool, but then Google presented it as a platform, and the next thing you know agriculture, traffic reports, all sorts of applications were built on top of that data feed. Similarly, we can empower universities, startups, and app builders with space data.

What were you looking for when you signed on with LeoLabs? I was looking for a brilliant, close-knit team pursuing a big idea. At LeoLabs, we have astrophysicists on the development team, and even an ex-astronaut, brilliant folks who know how to translate data into orbits and build cool stuff. So, obviously, I valued technical competence. We're also looking for people who brought the same spirit. Maybe that's not the right word, but our founding team is smart, team-oriented, and humble. Everybody has passed that test.

What books influenced your decision to join LeoLabs at this stage of your career? One is *Mindset: The New Psychology of Success*, by Stanford psychologist Carol S. Dweck. She's had so much impact with her notion that life is not an either/or proposition. The other is *Deep Work: Rules for Focused Success in a Distracted World*, by Cal Newport. It makes the case that shallow skills — doing spreadsheets, using social media — don't matter as much as developing the ability to learn something hard quickly, to go deep on something. With LeoLabs, I have the opportunity to go deep — on space data, on the physics of LEO, and on an emerging ecosystem. ▲

Alan DeClerck earned an MBA from Stanford GSB in 1985.

ECONOMICS

How Predatory Bidders Manipulate Massive Auctions

Some companies pay less for wireless licenses by leveraging a flaw in the purchasing process.

BY LUKE STANGEL

Auctions are good way to efficiently value an asset based on market demand.

Most people are familiar with traditional auctions that involve an auctioneer calling out steadily ascending prices, until there's a single buyer left with their bidding paddle in the air. But there are other types of auctions: those with private bids, those where everyone is assumed in until they drop out, and others where the auctioneer starts at a high price that descends.

Perhaps the most complex form are auctions where assets of different types are bought or sold simultaneously, like the spectrum auction being conducted by the Federal Communications Commission, in which TV broadcasters across the U.S. are selling tens of billions of dollars of wireless spectrum to mobile internet providers.

In the latest auction, which ended in March, the FCC purchased hundreds of television licenses in order to create a set of radio spectrum licenses for wireless services. These licenses were then sold to mobile internet providers.

Jonathan Levin is the Philip H. Knight Professor of Economics and Dean of Stanford GSB. Andrzej Skrzypacz is the Theodore J. Kreps Professor of Economics at Stanford GSB.

Illustration by Paul Blow

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Researchers from Stanford GSB are not only studying the bidding behavior in spectrum auctions, but in some cases, they've also helped design the underlying mechanics of these auctions.

In a paper, Jonathan Levin, the dean of Stanford GSB, and fellow Stanford GSB economics professor Andrzej Skrzypacz examine an auction format first used in 2005 and currently in use worldwide.

They found surprising quirks in this type of auction's format that create major strategic uncertainty and open the opportunity of predatory bidding, with little or no cost to the predator.

"There is no perfect design," Skrzypacz says. "Designing multi-unit auctions is part science, part politics, part art. There are difficult decisions to make and, depending on the goals of the auction, different designs may win."

THE COMBINATORIAL CLOCK AUCTION

Levin and Skrzypacz studied the combinatorial clock auction format after noticing an intriguing trend in these types of auctions: One company would sometimes pay less than competitors, despite winning similar or larger amounts of spectrum.

The combinatorial clock auction format involves an initial multi-round stage of bidders publicly declaring their interest in bundled packages of spectrum at different price points, followed by a second round of sealed bids. Trinidad and Tobago ran the world's first combinatorial clock auction, ultimately raising $25.1 million.

In Canada's 2014 combinatorial clock auction, Bell Canada picked up a package of spectrum for 570 million Canadian dollars, while competitor Telus got a similar package for $1.14 billion CAD.

In Switzerland, Swisscom picked up a package for 360 million Swiss francs while a competitor paid 482 million francs for a smaller package of spectrum.

Were these apparent anomalies to be expected in an efficient auction with nonuniform pricing, or were they flukes in the system? Or were successful bidders somehow leveraging flaws in the process?

"We spent a lot of time asking ourselves, 'Is the behavior we're observing special to this country, or is it a general property of this auction?'" Skrzypacz says. "We tried to figure out new properties of the combinatorial clock auction that people were unaware of and to show they're quite robust, rather than mistakes by bidders that may disappear with experience."

Levin and Skrzypacz found the combinatorial clock auction can be manipulated. Bidders can bid more aggressively or less so, which can result in an inefficient allocation of spectrum and prices that are hard to explain. This discrepancy has to do with an element of the combinatorial clock auction called Vickrey pricing, where the winning bidder doesn't pay the final price they bid but an equivalent of the second-highest price in a single-unit auction.

For example, say Alice bids $100 for item 1 and $80 for item 2, while Bob bids $50 for item 1 and $150 for item 2. Bob would win object 2 and pay $80 (Alice's bid for that item) and Alice would win item 1 and pay $50 (Bob's bid for that item).

The intent of Vickrey pricing is to provide incentives for Alice and Bob to bid their true values in an auction, which would allow spectrum to be allocated efficiently.

Strategic difficulties arise if, in this example, Alice values item 2 at $80, but thinks that Bob will bid at least $120 for the item. Alice may be completely indifferent to bids between $0 and $120, since she knows she'll lose the item to Bob anyway. If she wanted to put her competitor at a disadvantage, she might increase her bid to $110.

> **"There is no perfect design. Designing multi-unit auctions is part science, part politics, part art."**

This problem is compounded in a multi-round auction, where bidders can observe the behavior of their competitors and infer something about their final bids. These elements can create an incentive for predatory bidders who have no interest in winning a specific package of spectrum but aim instead to artificially drive up demand for that package, in hopes that it will cause their competitors to pay more.

Knowing competitors may try to artificially affect prices, bidders may alter their auction plan, further throwing off the auction's equilibrium, Skrzypacz and Levin write.

"People knew [the combinatorial clock auction] wasn't going to be a perfect design, but I think the surprise is how big an issue strategic uncertainty with multiple equilibria would be in practice," Skrzypacz says.

Skrzypacz adds that the paper's goal is not to end combinatorial clock auctions, but rather to prompt regulators to think harder about the best format for their specific auction.

In auctions where packages are necessary, the combinatorial clock auction could very well be the best available option.

As the FCC began designing its current auction, it looked at the latest research around the combinatorial clock auction and other auction formats and opted for a format that borrows elements from an earlier format called the simultaneous multiple-round auction, Skrzypacz says.

This latest auction, widely considered the most complex auction in history, will no doubt fuel future research into the subject. ▲

A SMARTER WORKFORCE Challenge existing practices.

HIRING

Forget the "Post and Pray" Method of Hiring

How to find the right people at the right time.

BY LUKE STANGEL

20th Century Fox

Hiring isn't easy. Employers might get hundreds — sometimes thousands — of resumes for a single open position and still, somehow, hire the wrong person. Companies working in emerging fields like artificial intelligence or robotics have far more job openings than talented people to fill them. There's been a shortage of software engineers and health care workers for more than a decade.

As America's aging population of baby boomers exits the workforce and is replaced by automation software, the country will likely see a shift toward more health care and social assistance-related jobs over the next eight years, the Bureau of Labor Statistics says. Of the 15 fastest-growing jobs in America, eight require an associate's degree or less, and most are in a health care–related field.

Van Ton-Quinlivan received her MBA from Stanford GSB in 1995. She is the vice chancellor for workforce and economic development for California's community college system.

Companies that take the long view prepare for their future hiring needs by investing in workforce development programs, which help develop a pipeline of talent that the company can tap into.

Van Ton-Quinlivan built workforce development programs as an executive at Pacific Gas & Electric and today helps companies design their own programs as the vice chancellor for workforce and economic development for California's community college system.

A 1995 Stanford MBA graduate, Ton-Quinlivan recently sat down with *Stanford Business* to share her thoughts on why workforce development programs work, their biggest challenges, and what the future will likely hold for hiring in the post-automation world.

What is workforce development, and what does a functioning workforce development program look like in action? The key to a workforce development program is that a company is able to find the right people with the right skills at the right time. With people, it's a combination of quality, capabilities, and diversity. The greatest struggle is that without some proactive work to develop that workforce pipeline, it's a bit of guesswork whether you're going to get the right people with the right skills at the right time.

Employers are increasingly finding themselves in the "post and pray" mode, rather than having confidence that there's a sufficient pool of quality, diverse candidates that they can recruit from. That's why, in the last few years, employers have become much more proactive in thinking through how they really restructure the supply chain that brings them talent.

We've seen a number of occasions where the talent supply and talent demand were completely off. We saw it with engineers in Silicon Valley; then we saw it with nursing, where we were importing nurses from other countries because we had such a shortfall. We'll continue to have these big moments of crisis if we aren't more proactive about building these talent pools.

> **"We'll continue to have these big moments of crisis if we aren't more proactive about building these talent pools."**

Is there a workforce development program that you think works particularly well? Can I talk about my own model? [Laughs]

I was part of the PG&E PowerPathway model, which was recognized nationally for its industry best practices. Not only did it single-handedly change out the diversity composition of the frontline workforce for PG&E, it also put talent to its best use.

For example, we were able to bring in recently [returning] veterans. By doing a workforce development program, we got them ready to more effectively compete for jobs at PG&E. Instead of earning $30,000 or $40,000 per year, they began in careers that started at $60,000 to $80,000 and had the potential to break $200,000 within their career.

For some, it may have been a long time since they had taken a timed test, or they had to freshen up their math skills. That's where community colleges kicked in and were able to design custom training to close that gap in knowledge or skills.

Part of setting up the workforce development pipeline is that you have to challenge existing practices. There was not a shortage of candidates at PG&E, but they tended to be friends of friends, or family members of existing employees, which challenges our [desire for a] diverse pool of candidates.

What we needed to do was look at where the pool was coming from and create a wave of nontraditional and diverse communities. We worked with partners in the community to do the outreach, awareness, and screening. Then it was the role of the education institutions to close the gap in terms of skills training.

So there's a screening component and a training component. As employers, our role was to articulate what we wanted in terms of knowledge, skills, and abilities.

What do you wish employers would do more of in this area? The generation that's exiting the workforce is the most educated generation in American history. After them, it's a much lower rate of education, and our K-12 population is shrinking. With the exiting of the baby boomers and the shrinking of K-12, talent will become a basis of competition [between companies].

Treat your talent development as part of your supply chain strategy. Education institutions are part of that supply chain. They're not good mind readers, especially given how fast the rate of business is changing. Keeping up with the speed of business is going to take much more communication between employers and education institutions.

What's the greatest misconception today about hiring and workforce development? There's a lot of need for jobs that require a bachelor's degree or more, but there's an equally large need, especially in California, for middle-skilled jobs, which require more than a high school diploma but less than a baccalaureate degree.

These are your emergency medical technicians, first responders, people who check you into the hospital and take your stats, handle your records and the equipment within the hospital. Employers have neglected to put a lot of public attention [on these types of job opportunities], so they're not being produced with the level of precision and quantity that's needed.

Automation and artificial intelligence will eliminate millions of jobs within the next decade. Self-driving cars and trucks threaten to reduce the number of professional drivers, and artificial intelligence could replace some service jobs, like call center workers. How are workforce development programs planning for the post-automated workforce?

Jobs are different now, because they have huge technology elements to them or are being reshaped by technology. Take truck drivers. On the horizon, UPS is developing fleets of self-driving trucks, and they're coming a lot faster than we think. Or consider waitresses. You see this in airports now — instead of having waiters and waitresses inside restaurants, you now have maybe one or two people behind the counter and the rest of us are placing orders on iPads.

The big challenge we have as a country is that we haven't built out the social infrastructure, where there's a constant sequence of skilling, reskilling, and upskilling. The challenge for us is figuring out how to set up the systems so that the on-ramp and off-ramp to training, employment, and reskilling is more fluid, rather than just early [in high school and college] and once in a lifetime.

It's evolving, because the shelf life of skills is now shorter. It's going to be a challenge for all of us.

When you graduated from Stanford Graduate School of Business, did you think you'd eventually be working in education policy? I've always had a love of education. Back when I was at Stanford, I did a dual degree — Master of Education Policy — along with the MBA. I went to the private sector and worked in high tech and telecom and found myself, in my downtime, reading a lot of articles about education policy rather than technology magazines.

One day it occurred to me that this is really my avocation, and I started to think about how to begin combining my avocation and my vocation. It was a bit of a journey to figure that out. I started with some pro bono work, serving on boards, really serving where I could have the greatest impact.

Over 10 years ago, I realized community colleges are the places where the [diverse] workforce could come from.

For readers who might be running or starting their own workforce development program, what would your advice be? There's a bit of art in timing these programs. It's an issue of what I would call the hose versus the hydrant. Jobs tend to drip out one or two at a time, but workforce programming is measured in cohorts. You need at least 15, 20, or 25 positions in order for it to be worth the effort, based on the economics.

In order to make the investment of time, you have to listen to where the workforce pain is, where it's so painful to hire that your [recruiters are] giving up. At PG&E, we created a program to generate more energy-efficiency engineering applicants. Our company couldn't find them — it was just too much work for one company to do alone, so we partnered with other companies.

This is an important point: With the talent supply chain, employers compete with one another for talent. We can compete for talent at the end of the process, but if we don't come together to help develop a talent pool, we're going to get a talent puddle.

This program required employers coming together and bringing our collective resources, because the content was so state-of-the-art at the time that each of these companies needed to bring guest lecturers in order to fill up the class.

At the end of the day, we were all so relieved that now there was actually a pool of people to recruit from. It was way too much work for any one company. Developing a workforce pipeline is not necessarily an individual sport; it really is a team sport. ∆

FIVE TIPS FOR CREATING A WORKFORCE DEVELOPMENT PROGRAM

Companies build workforce development programs when they want to hire employees with diverse backgrounds or employees in fields where the demand for workers far outstrips the supply of talent. Here are five tips for developing and running a workforce development program:

1

Identify the Need

Talk to stakeholders inside your company about future hiring needs and where they're having the hardest time finding an adequate number of candidates. Many large companies run workforce development programs designed specifically to attract female candidates, people of color, and candidates with nontraditional backgrounds. Specific industries, like health care, create workforce development programs to respond to an ongoing talent crunch. Once you've identified the need, assign measurable goals to the program to gauge its effectiveness over time.

2

Partner with Others

Two corporate rivals might create competing workforce development programs designed around similar hiring goals. That can result in two half-baked programs that return suboptimal candidates. Think about partnering with competitors, community groups, and schools to build a more robust program together. The resulting candidates will likely get more out of the program and be better prepared for the job.

3

Help Shape the Curriculum

Schools may not necessarily know what your industry's needs are. Work with schools to develop teaching materials that will result in high-quality candidates. Some companies lend their employees to a workforce development program to serve as instructors.

4

Identify Talent Early in the Process

If there's a training component to your workforce development program, try to identify promising candidates early in the process and talk to them about their individual career goals. Doing so may help you jump to the front of the line when it's time to recruit from the talent pool.

5

Compete at the End

Companies that choose to partner with competitors to build a workforce development program compete for talent at the end of the process. It's easier to cooperate at the top of the talent development funnel and later compete at the bottom, rather than build the entire funnel on your own. Cooperation results in better candidates.

HEALTH

Why Your Doctor Needs an MBA

The increasing complexities of health care require more than medical training.

BY MARTIN J. SMITH

Chances are that during your last medical exam there were three of you in the room: you, your doctor, and your doctor's computer.

For most of us, that's the most obvious sign that the business of medicine is changing fast. As your doctor asked about your symptoms and health history, he also was creating sophisticated electronic medical records that eventually will be used for treatment, referrals to specialists, billing, and even to ensure quality control. Properly treating patients today requires not only an understanding of the most effective medical therapies, but also leadership, teamwork, and complicated data analysis — skills traditionally taught in business schools, not medical schools.

That, too, is changing: Nearly half of all U.S. medical schools, including Stanford, now offer dual MD/MBA degree programs.

"I went into medicine with the 'country doctor' ideal in mind," says Christopher Krubert, a physician and operating partner with the private equity firm Advent International who teaches at Stanford GSB. "But I realized pretty quickly the complexity of being a practitioner makes it impossible to focus solely on clinical care. You can't get away from it."

Twenty years ago, says Krubert, "80% of your job was being a clinician, and the other 20% you were a businessman. But today the business side takes up more than 20% of your time. So where's that time coming from?"

As physicians struggle to answer that question, we asked Krubert to discuss the ongoing integration of medical and business training. He received an MBA from the Stephen M. Ross School of Business at the University of Michigan in 1993 and an MD in 2000 from the University of Chicago, where he trained in emergency medicine.

Christopher Krubert, a lecturer in management at Stanford GSB, advises businesses in the health care industries.

Illustration by Shout

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What's driving the need to make doctors smarter about business? I count nine major factors, everything from the logistics of patient care to the complexity and treatment of illnesses, to consumer awareness among patients. But it starts with industry consolidation. Insurance companies are acquiring competitors, merging and getting bigger, in part fueled by the passage of the Affordable Care Act. But hospitals are consolidating too. The local hospital is going by the wayside, and hospital groups are getting bigger and more powerful. The doctors feel that their clout is getting less and less, so they're moving toward consolidation themselves.

Most people assume a doctor just needs to know how to bill patients and work with insurance companies. You're saying it's more involved than that? Think about the logistics of patient care today. Because we can keep people alive longer and the population is aging, those people naturally have more medical complexity. And then there's the obesity trend; it's rising across the U.S. Both of those realities trigger multi-disease states — diabetes, heart disease, pulmonary issues, musculoskeletal issues, psychosocial issues, to name a few. The patient may require many specialists, and someone has to coordinate that care.

Which is why doctors need to learn more about leadership and teamwork? The practice of medicine was historically that of an independent practitioner — one doctor treating one patient. Today, doctors have to increasingly work with many more practitioners, care coordinators, and others to care for a single patient. And the treatments themselves are getting more complicated. Gene therapy, more complex pharmaceutical and therapeutic options. All that's good, but it's getting harder for a doctor to keep up with all of it. Being part of a larger group can provide the resources a doctor needs to optimize care.

Doesn't operating in a larger business environment bring its own set of challenges? Networks of physicians are becoming like air traffic controllers, attempting to navigate the complex world that is health care today. Some primary care doctors are now seeing 40 to 50 patients in a day. That can leave them with only four to five minutes per encounter, which often results in them referring the patient to a specialist. Through all this, they have to keep costs manageable, because cost has become a major issue.

Is that all being done through electronic medical records? Electronic medical records have become a necessary part of the process, although sometimes they're frustrating in that they can add more time to the encounter while actually reducing the doctor's interaction with the patient. The upside is that we can track and monitor data better. Plus, reimbursement is slowly moving away from the accepted "fee for service" to more of a value-based payment structure. Today, if someone comes to me with chest pain, I simply treat them and bill Medicare for treatment of chest pain regardless of the outcome of that patient. In the future the system will be looking at the outcomes of patients over time, then pay me more or less depending on the quality and efficiency of my services, partly based on patient surveys and partly on objective measures.

So that's where data analytics comes in. Data can be the grand clarifier of what's working and what's not, and doctors need to be championing it in their practices. But let me add that keeping things personalized and human remains paramount.

One of your Stanford students, Alexander L. Fogel, recently coauthored an article proposing that medical schools join with business schools to build a four-week clinical rotation into the medical school curriculum that would teach new doctors leadership, teamwork, and data analytics. Will that help to solve the problem? I think it's a great idea and a great start. It'll help young doctors understand what they're getting into. You don't want them going in thinking, "I'm looking for a career as an independent," when in fact the environment is completely different. It creates an awareness of what's going on and merges the important elements of medicine and business. It also shows them how to best navigate this system to achieve the best outcomes for their patients.

Are impending changes to the Affordable Care Act going to make this better, or worse? Let's step back from the political element and look at the overall health care market. Patients are getting sicker, but there's not enough money to go around. The current cost escalation is not sustainable, so everyone is understandably focused on costs. The key will be to save dollars not by rationing but by looking for ways to be more efficient and cost-effective while still delivering great care. How the system will change exactly is up for grabs, but it's still going to require a shift from the way doctors are practicing and the way consumers are expecting health care. There has to be a movement toward understanding not only what's the best care, but also what's the most efficient care for the best value. As I said, health care is currently about 17% of the U.S.'s entire GDP. If we cut out all of the inefficiencies in the system, I estimate that we can reduce that by about 20%.

> **"Data can be the grand clarifier of what's working and what's not, but keeping things human remains paramount."**

Most of us like the idea of being treated by doctors who aren't preoccupied with mundane things like billing and reimbursement. Should patients worry that their medical needs are becoming an afterthought? I wish that wasn't the case, but, yes, for now I think that can be a risk. Doctors are human. It's getting harder to practice clinical medicine. They're working more hours, but often they're not making more money and sometimes they're making less. Can they sustain that before they give up? Will it start impacting patient care? Can we still attract the best and the brightest into the field? The first stage of addressing that will be to eliminate inefficiencies. At the same time, we need to ensure that practicing medicine isn't all about focusing on costs — that doctors stay focused on the needs of the patient. Δ

World

“We’ll be successful if we show that a young engineer from **a small town in Mexico** can build a superb company.”
— **Federico Antoni** PAGE 52

Mike McQuade

THE BENEFIT OF BEING LICENSED A 2015 California law reduced hit-and-run accidents by 7% to 10%.

IMMIGRATION

What Happens When Unauthorized Immigrants Are Given Permission to Drive?

A new law leads to a surprising reduction in hit-and-run accidents.

BY MARY DUAN

When former California Assemblyman Luis Alejo, D-Watsonville, introduced a bill in the legislature to grant special driver's licenses to unauthorized immigrants, providing they could prove they live in the state, opponents not only argued that the law could damage immigration enforcement, but also questioned how it could benefit public safety. Having a license didn't mean a driver would have top-notch driving skills or possess the language skills necessary to interpret English-language traffic signage, and it didn't mean they would buy auto insurance as required by law. Roads would become less safe, opponents maintained.

Alejandro Cartagena

More than two years since Alejo's AB60 took effect in 2015, over 800,000 unauthorized immigrants have obtained licenses in California. Did the concerns of those critics materialize?

A trio of Stanford researchers with the Immigration Policy Lab set out to investigate the impact of such licensing policies nationwide and drilled down into whether AB60 had an impact on public safety. They found that the policy did not increase the rate of total accidents or fatal accidents and actually helped reduce the likelihood of hit-and-run accidents, thereby improving traffic safety and reducing overall costs for California drivers.

The researchers published their findings in Proceedings of the National Academy of Sciences in April.

"Coming to this as scientists, we were immediately shocked by the absence of facts in this debate. Nobody was drawing on any evidence; it was more characterized by ideology," says Jens Hainmueller, Stanford GSB professor, by courtesy, of political economy and codirector of the Stanford Immigration Policy Lab, which focuses on the design and evaluation of immigration and immigrant integration policies. "There was no real evidence of the likely consequences."

Hainmueller, along with Immigration Policy Lab executive director Duncan Lawrence and Hans Lueders, a graduate fellow at the lab and a PhD student in the Stanford political science department, narrowed in on traffic-safety outcomes because they found it was the most prominent issue when such licensing policies are discussed.

Opponents "are concerned about potential increases in accidents, or whether those

Jens Hainmueller is faculty codirector of the Immigration Policy Lab, a professor of political science at Stanford, and a professor by courtesy at Stanford GSB.

accidents may encourage drivers to run away, but we didn’t find evidence of the causative effects,” Lueders says. “That’s how we determined this would be the most salient issue and the easiest to measure immediate effects, because not that much time has passed since the law was enacted.”

The researchers combined data from two sources to estimate the short-term effects of AB60. They examined monthly data on accidents reported by the Statewide Integrated Traffic Records System of the California Highway Patrol from 2006 to 2015. They also looked at data from the California Department of Motor Vehicles on all outstanding licenses before and after the implementation of the law to estimate the share of each county’s AB60 licenses.

The data suggests that AB60 led to a decrease of 7% to 10% in the rate of hit-and-run accidents in 2015, compared with 2014. That translates to about 4,000 fewer hit-and-run accidents.

“It suggests that these policies can have positive effects on traffic safety,” Lueders says. “If drivers at an accident remain on the scene, they can be held responsible and pay for the damage. This amounts to more than $17 million attributed to the at-fault driver.”

The researchers also estimate all drivers in California saved $3.5 million in property damage costs because of the reduction in hit-and-run accidents.

“There are broad externalities on everyone,” Hainmueller says. “It’s an important takeaway for the greater debate.”

That greater debate is happening across the country. California is one of 11 states to implement such legislation. In New York, state legislators are considering passing a law similar to AB60, and the governor of Minnesota is advocating for a similar law there.

Given the current political climate, the researchers expect to see a bifurcation of sorts happening from state to state.

“Some may move toward more inclusive policies and others are moving in an exact opposite direction,” Lueders says. “I think we will see more of a polarization.”

The researchers plan to study AB60 impacts further. One future project may investigate whether unauthorized immigrants who possess AB60 licenses feel free to drive farther — traveling at longer distances may open up education opportunities that could impact community college enrollment and allow better access to health care and employment.∆

AUTHORIZED TO DRIVE

Providing driver’s licenses to unauthorized immigrants in California improves traffic safety, according to a study conducted by the Stanford Immigration Policy Lab and published in the *Proceedings of the National Academy of Sciences* in April.

605,000

Driver’s licenses
(Issued under the AB60 program in 2015)

The impact of California AB60

-10%
Change in hit-and-run accidents

No
Change in fatal accidents

No
Change in total accidents

What did this mean for California drivers in 2015?

4,000
Hit-and-run accidents prevented

$3.5 Million
Out-of-pocket expenses saved

$17 Million
Costs transferred to at-fault drivers’ insurance

Driver’s license: Oliviu Stoian from the Noun Project; injury: Artem Kovyazin from the Noun Project; ambulance: hunotika from the Noun Project; car accident: anbileru adaleru from the Noun Project

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SECURITY

How the Financial Industry Can Defend Itself Against Hackers

A former U.S. Treasury deputy secretary says collaboration is key to blocking the onslaught.

BY STEVE HAWK

In her three years as deputy secretary of the U.S. Treasury Department, Sarah Bloom Raskin feared one thing above all others: a debilitating cyberassault on the country's financial institutions.

"What I worried about was an attack that would result in a misappropriation of funds — one where you log into your account, go to check your balance, and it reads zero point zero zero," says Raskin, a presidential appointee who left her position as second in command at Treasury in January after Donald Trump became president. "We've yet to experience that on a massive scale in the United States."

Driven by the specter of such a doomsday scenario, Raskin launched an initiative to tighten web security not only within her 100,000-person bureaucracy but also throughout the global financial industry. She spoke about the details of that effort and the ever-shifting risk of fiscal hacking, among other topics, during a recent visit to Stanford GSB as part of a new interdisciplinary Finance and Society Visitor Program. Through the program, financial experts with experience in the financial system, policy debates, and the media spend a week or more on campus sharing their knowledge with students and others.

When she was at the Treasury Department, Raskin's first order of business was to persuade upper-level executives in both the public and private financial sectors to treat the threat of cyberattack as a policy priority.

"Cybersecurity primarily has been in the province of the IT folks, so traditionally they were the only ones who knew how to talk about it, which means it wasn't connecting up to the C suite," she says. "Organizationally, most IT shops report up through the procurement line, but cybersecurity is such a huge exposure that you don't want to just leave it at your procurement shop. It should be going up through your chief risk officer, with direct avenues to your CEO and your board."

At the Treasury Department, she forged a collaboration between policy wonks and tech geeks to ensure that people who otherwise never might have met were aligned when it came to security. The threat at Treasury went beyond fiscal concerns, Raskin says, because the agency not only prints all U.S. currency and pays the government's bills, but also oversees and collects taxes through the Internal Revenue Service, which means it houses private information about every American taxpayer.

When it came to the financial sector, Raskin believed the government should not indiscriminately impose its regulatory muscle as a way to improve security against hacks. She felt instead that it was more optimal to seek ways in which the government and businesses could work together to create more resilient structures and systems.

"It was more collaborative than combative," she says. "Also, one problem with regulations in this space is that cyber vectors morph quickly. You don't want a regulation that becomes outdated the moment it's issued."

Raskin credits the U.S. financial industry for making "huge investments" in ensuring that its assets, systems, and customer information remain safe from catastrophic hacks. A key to that success, she says, has been the creation of segregated systems that rank digital assets based on risk tolerance, then design safeguards accordingly. Some things don't have to be guarded by expensive, impenetrable systems, while others must be protected at all costs.

Dagli Orti/REX/Shutterstock

ACCESS DENIED The U.S. financial industry has yet to experience a catastrophic hack.

> **“You don’t want a regulation that becomes outdated the moment it’s issued.”**

How to secure these “crown jewels,” as she calls them, is the source of debate among bank-security experts: “Do you put all of your crown jewels in one treasure chest, then put a lock on it, put a belt on it, and store it in a sealed container? Or do you take your crown jewels and put some over here, a couple over there, a couple under the desk, so that you mitigate the loss if there’s a breach?”

When she talks to industry executives, Raskin recommends several safeguards that are rapidly becoming common practice:

- Forcing customers to use multi-step authentication, which requires more than a username and password to log in to a system. “A lot of companies have it but don’t insist on it,” she says. “That’s an easy fix.”
- Rapid implementation of patches to known vulnerabilities.
- Participation in information-sharing hubs, so that, for instance, if one company spots an attack from a certain IP address, others in the industry are immediately alerted.
- Frequent reviews and updates of a system’s privileged-access users. “Especially in the early stages, we were finding entities that had hundreds and hundreds of people on these lists who didn’t belong,” she says.
- Closer monitoring of third-party vendor access. Raskin points specifically to the 2014 hack of Target Corp., in which cyber thieves downloaded personal information, including credit card numbers, of up to 110 million of the retail chain’s customers. In that case, hackers cracked into the system using network credentials stolen from a refrigeration, heating, and air-conditioning subcontractor.

As an additional precaution, Raskin recommends that corporate IT departments assemble playbooks and organize simulations so they’ll know how to respond in the case of a serious system breach, just as agencies like the Federal Emergency Management Agency often do to prepare for natural disasters.

“You simulate an attack and you engage in exercises,” she says. “Just like a FEMA drill.”

Sarah Bloom Raskin is the former deputy secretary of the U.S. Treasury Department.

DISTRIBUTION

Bringing Online Shopping to Rural Africa, Village by Village

The founder of Copia Global modernizes a century-old model to reach the world's poorest people.

BY MARTIN J. SMITH

Social entrepreneur **Tracey Turner** says Kenya today has the same problem with product sales and distribution that plagued 1890s America: How do you get goods to people who live in rural areas and whose only access to shopping is a general store or vendor in the nearest village?

The problem, she says, was solved for American consumers at the turn of the 20th century, when the creation of the postal service made the Sears catalog possible. "You could buy everything from fertilizer to wedding dresses through the Sears catalog," Turner told a Stanford Graduate School of Business audience in 2012, the year she launched Copia Global. "We want to take that same concept ... and empower that rural consumer to become a part of the global economy."

Founded by Turner and other Silicon Valley entrepreneurs, Copia, which has raised $5.5 million to date, uses mobile technologies to connect remote consumers to the goods they need to better their lives. Turner is the company's executive chairman.

Copia's 100 Kenya-based employees have recruited about 1,000 shopkeepers in villages surrounding Nairobi. The shopkeepers share the Copia e-catalog with their customers and receive a commission on every sale made via the company's app. Copia trucks then deliver orders to the shops within 48 hours for customer pickup.

We asked Turner, who received her MBA from Stanford GSB in 1998, about the challenges and satisfactions of social entrepreneurship.

The Sears catalog relied on Rural Free Delivery from the U.S. Postal Service. How has modern technology reshaped that old distribution idea? The way I think about it is there was this new technology that hit the U.S. in the late 1800s — the postal system. That enabled the Sears catalog model to be born. It couldn't have existed without that innovation. Similarly, when the internet became ubiquitous in the 1990s, Amazon's business model came into existence and transformed retail consumerism. For us, in the most rural and poorest parts of the world, mobile technologies are the tech innovation that suddenly enabled a Copia business model to succeed. We're talking about 3 to 4 billion people, half the world's population, who have been left behind and suddenly can be served profitably.

You really feel Copia could have a similar impact? Absolutely. If you think about the U.S. in the late 1800s, generally people were poor, agrarian, and had limited access to goods other than a small general store. The dynamics are very similar in emerging markets today.

How did you raise the money to get the company off the ground? There's a whole world of angel and social venture capital investors who think like I do. They put their investment dollars to work changing the world. They focus on investing in social businesses where they can earn a return and make a positive impact.

How did your experience at Grameen Bank shape your career? Hugely. After living in Kenya and Bangladesh, it was apparent that the poor are not charity cases. They're as hardworking as anyone anywhere because they have no safety net, no Medicaid or welfare. So it was obvious to me from early on that if we can provide them with the same access to goods, education, and awareness, we can make a big difference in their lives.

You've paraphrased Jacqueline Novogratz of the Acumen Fund, also a Stanford GSB graduate, about the dignity that choice can give. Yes, "choice is dignity, dignity is choice." I've always been a big fan of hers. She and I have a very similar philosophy in terms of international development: Use the best of capitalism to address social issues.

What steered you onto the path of social entrepreneurship? Right out of undergrad, I worked for a nonprofit and saw the limitations of the nonprofit structure. Don't get me wrong — sometimes this is exactly the right structure to have. But in many situations, the executive director must focus on fundraising, which is different from effecting change. Sometimes there's a tension that pulls the executive director in the wrong direction while they're chasing money. In some situations, like Copia, you can actually generate profit and enable social change symbiotically. And I would argue you can have more impact that way because the more profit you make, the more change you effect. It's a positive spiral.

What were some of Copia's unique startup challenges? In emerging markets, people come from a place of distrust. There's a sense that if you give me the opportunity to rip you off, shame on you. So when we enter a new location, there's an immediate sense of distrust: Are you going to rip me off? We've had to do a lot in terms of building a trustworthy brand, because they've never had that before. The good news is that once you have their trust, they're loyal forever.

Just letting people in poor rural areas know about Copia's services must be a challenge. What's your marketing strategy? The first

Photograph by Drew Kelly

TRACEY TURNER
"Once you have their trust, they're loyal forever."

thing we do is to approach a shopkeeper in a village where we can be useful, somebody who's already running a restaurant or a hair salon or whatever. Then we recruit them to become an agent for Copia. We give them a tablet device loaded with our app, so when customers come and shop they can show them the app. Most of our base is built through shopkeepers spreading the word or taking the tablet to their church or women's group. They're our local "sales team."

As Copia expands, what qualities are you looking for in your hires, and which quality is the most important in an enterprise such as this? It's not all that different than building a normal sales team for a Western company, but there are language requirements and a need to understand cultural norms. We attract the best people we can, but not necessarily people who have some kind of social entrepreneurship bent. To them it's just entrepreneurship.

What book or books influenced your choices as you embarked on this career? *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses* by Eric Ries, which integrates the idea of failing quickly and failing inexpensively. We live and die by that model. We're constantly running little experiments to learn quickly and on a small scale.

What do you know now that you wish you had known when you started? It's really hard to get good technical people in Africa. There just aren't that many, and those who are there can command huge salaries from multinational corporations. We just never have enough good tech people. But we're excited about the idea of giving experienced Silicon Valley techies the chance to spend a year in the "wild west" of Kenya, a beautiful country with an opportunity to put technical skills to work in a meaningful way. ∆

Tracey Turner earned her MBA from Stanford GSB in 1998.

DATA

Does Artificial Intelligence Have Limits?

An expert examines the promise and challenges of tech's latest superpower.

BY SHANA LYNCH

Artificial intelligence already powers many of our interactions today. When you ask Siri for directions, peruse Netflix's recommendations, or get a fraud alert from your bank, these interactions are led by computer systems using large amounts of data to predict your needs.

The market is only going to grow. By 2020, research firm IDC predicts, AI will help drive worldwide revenues to over $47 billion, up from $8 billion in 2016.

Still, computer scientist and Coursera cofounder Andrew Ng says, fears that AI will replace humans are misplaced: "Despite all the hype and excitement about AI, it's still extremely limited today relative to what human intelligence is."

Ng, who is chief scientist at Baidu Research and teaches at Stanford, spoke to the Stanford GSB community as part of a series presented by the Stanford MSx Program.

Here he discusses why AI gets a bad reputation, what reputation it actually deserves, and how we need to rethink our education system to prepare.

THE NEW ELECTRICITY

Electricity changed how the world operated. It upended transportation, manufacturing, agriculture, and medicine. AI is poised to have a similar impact, he says. Information technology, web search, and advertising are already being powered by artificial intelligence. It decides whether we're approved for a bank loan. It helps us order a pizza and estimate our wait time, and even tells the driver where to deliver it. Other areas ripe for AI impact: fintech, logistics, health care, security, and transportation.

"Just as electricity transformed almost everything 100 years ago, today I actually have a hard time thinking of an industry that I don't think AI will transform in the next several years," Ng says.

SCARCE RESOURCES

What's slowing down AI adoption? Two problems: scarcity of data and talent. For AI to be meaningful, companies need to feed their algorithms vast amounts of data, which isn't always readily available.

In fact, Ng says some large companies launch products for the payout of data, not revenue, and then later monetize it through a different product.

These companies are also engaging in a talent war for smart employees. "I would say the most scarce resource today is talent, because AI needs to be customized for your business context," Ng says. "You can't just download an open-source package and apply it to your problem."

REPAIRING AI'S REPUTATION

AI has a couple of image problems. One is deserved and one is not.

No, it will not someday control the human race. "I think that there is no clear path to how AI can become sentient," he says. If it does, it might take hundreds or thousands of years. "Worrying about evil AI killer robots today is a little bit like worrying about overpopulation on the planet Mars."

The real concern regarding AI is societal impact. Evil AI hype, he says, is being used to whitewash a much more serious issue, which is job displacement. "AI software will be in direct competition with a lot of people for jobs," he says. That's something Silicon Valley needs to own up to, he says.

RETHINKING EDUCATION

Because of this job displacement, the U.S. would be wise to rethink its educational system. Automation in agriculture led the United States to overhaul its education system and develop the K-12 and university system we use today. Similarly, the U.S. must develop a way to reskill people whose jobs are taken by computer algorithms.

"I think government should give people a safety net, but pay the unemployed to study and provide the structure to help them study so as to increase the odds of gaining skills needed to re-enter the workforce." ▲

Andrew Ng teaches machine learning at Stanford University and is director of the Stanford Artificial Intelligence Lab.

Illustration by Rune Fisker

ENTREPRENEURSHIP

How to Nurture Startup Cultures in Unlikely Places

Connect with Silicon Valley rather than try to recreate it, says a Mexico City venture capitalist.

BY JONATHAN XAVIER

Stanford GSB lecturer Federico Antoni will tell you that he was never supposed to be a venture capitalist. But then, his home of Mexico City was never supposed to be a VC mecca either. When the former fashion industry executive first started thinking about launching a fund for early-stage startups, there were few success cases he could point to.

But the firm he founded along with fellow Stanford MBA ’04 alumnus Fernando Lelo de Larrea, ALLVP, is defying expectations along with the region it calls home. Since its creation in 2012, the firm has raised two funds and invested in 22 Latin American companies, most at the seed and Series A stage. In 2015, ALLVP had its first major exit, with the acquisition of the ride-sharing company Aventones by BlaBlaCar, a market-leading French startup with eyes on Latin American expansion.

It’s clear to Antoni that whatever the challenges faced in emerging markets, there’s a golden opportunity there for bold investors and entrepreneurs willing to forge the global connections needed to succeed. In this interview, edited for length and clarity, Antoni discusses the unique challenges faced by VCs in developing markets, and what it takes to succeed in a dynamic global climate.

When you started, Mexico didn’t have a strong startup culture. What unique challenges did that present? I think one of the first things needed is that a new ecosystem has to reconcile with failure. The relationship to failure in Silicon Valley is very healthy. You’re in fact often trying to fail, because if what you’re doing won’t work, you want to be able to go onto the next challenge as soon as possible. People trust that if you fail you will try harder next time. There is belief in the will of a founder and what they can build. Even if you’re trying for the fifth time, well, maybe the fifth time is when you will build something special.

But in developing economies, that culture is rarely there. Failure is not seen favorably. That’s a huge hurdle to launching companies, because most companies fail, and if the culture isn’t comfortable with that going in, not enough new companies will start.

And it’s not just companies; you need to tolerate failure of investors. Our limited

Federico Antoni co-teaches the class *Entrepreneurial Opportunities in Developing Economies* at Stanford GSB.

Photograph by Rodrigo Ceballos

FEDERICO ANTONI
"Tolerance for failure is paramount."

partners have to be comfortable with the idea that we might send them an email and say that there was a write-off. A lot of people will say that's part of the game, but when they actually get that email, it's very hard for them. So it's often hard to find enough limited partners like that to sustain the ecosystem.

Tolerance for failure is just paramount, and the key to building that is role models. It's important that different organizations start talking about failure. Just being open about your screw-ups, that's actually a start.

How do you overcome the lack of role models and build an ecosystem that's more self-sustaining? This is going to sound a bit obvious, but the best thing we can do is be successful. We'll be successful if we show that a young engineer from a small town in Mexico can build a superb company. If we show that a couple of middle-aged operators can return a lot of money to their investors, then the cycle is going to start. The engines are going to start moving faster.

For example, there's a company in Turkey called Yemeksepeti. It's a food-delivery company that was sold for $500 million. That has had a great impact in the Turkish ecosystem, because now you have a proof point. Now you have investors and a couple of funds that made a lot of money. You have entrepreneurs who became wealthy. Just one company like that can kick-start an ecosystem. You have more investors investing. You have more young people trying their luck and launching companies. You have more universities teaching entrepreneurship. You have everything because of a success case.

> "Once you have a handful of success cases coming out of some big fund, that's when things are going to get interesting."

In Argentina, there's a company called Mercado Libre. It was created in 1999 — out of Stanford, actually [by Marcos Galperin and Hernán Kazah, both MBA '99]. Mercado Libre is similar to eBay and it's a huge success. The founders went on to start a very successful VC fund. A whole generation of entrepreneurs came out of that one success in Argentina.

Success cases can go a long way, but you need a huge amount of people trying their luck. There's no magic. It's about big numbers. You need a lot of funds funding a lot of startups and attracting foreign capital. Once you have a handful of success cases coming out of some big fund, that's when things are going to get interesting in developing countries.

At the same time, governments around the world have been trying to kick-start their own tech and entrepreneurship hubs for years now. But if you look at global venture capital dollars spent, more than half of them are in the U.S., and the vast majority of those are in Silicon Valley. Why hasn't the distribution become more equal? No government program or internal market will create a new Silicon Valley. No one should be thinking about creating another Silicon Valley. The only Silicon Valley will always be Silicon Valley.

The opportunity is to build great *connections* to Silicon Valley — to attract not only Silicon Valley capital, but also Silicon Valley talent. There is the big opportunity for teams that come to emerging ecosystems.

The case of Startup Chile is a good one. Startup Chile is a program that basically subsidizes any entrepreneur who wants to launch a company in Chile. If you are an Indian engineer, you go to Chile, and you get up to $90,000 to start your company. You don't need to prove anything. You only need to be there and start a company there.

When you talk to the creator of that program, a Stanford GSB guy named Nicolás Shea [MSx '09], he tells you it has been both the best and the cheapest PR effort the Chilean government has ever done.

Government participation was paramount to the building of Silicon Valley. People talk a lot about Elon Musk, his mission to go to Mars. They don't talk as much about the subsidies that SpaceX received that allowed it to be built.

There are very good signs around the world. China and Israel are probably the best success cases — but they're doing their own thing, not trying to be Silicon Valley.

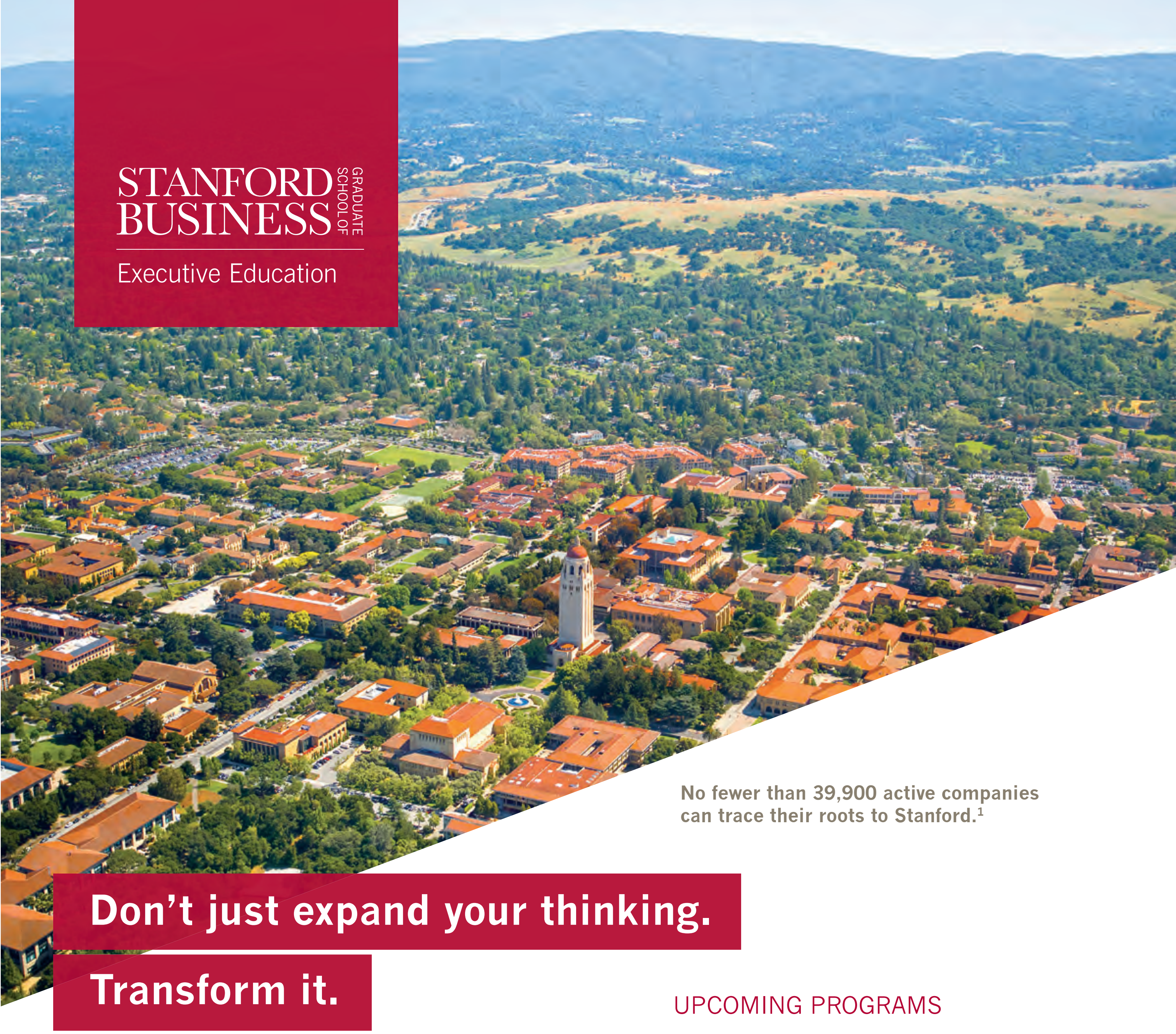
Israel's success as an innovative nation in particular is fascinating. As with any ecosystem, it's a bunch of different things playing together. A book called *Startup Nation* by Dan Senor and Saul Singer explains that Israel is a nation of immigrants, which makes them by definition risk-takers. It also suggests that the mandatory military service builds skills and connections that entrepreneurs leverage. Entrepreneur-friendly government policies and a highly educated population in STEM fields definitely help. But it's nonsensical to try to replicate Silicon Valley. The best way to take advantage of Silicon Valley is to build a relationship, build close networks.

Do you worry that the more isolationist trend that's taken hold in the world — Brexit in Europe, America's Mexican wall, etc. — will make it more difficult to build the global networks that emerging markets need to thrive? People who are older than us understand what happened to governments that were particularly protectionist in the 1970s. There's a lot of history around it. It's always related to the mobility of goods and people. Trump and the new British administration, they want to stop the movement of people and goods. They want to protect the manufacturing industry, and they want to stop illegal immigration.

They want to do it in a world where the speed of the flow of capital and the speed of a doctrine of technology is completely global. It's completely global, and it can't be stopped. Technology makes the world smaller. The sheer volume of capital that moves every hour, every second, all over the world, is too broadly integrated to go against it.

It's funny that the platform that President Trump loves most, Twitter, is such an international platform. And that's the world we live in. Maybe they can stop the flow of cars made in Mexico from crossing the border. But they're not going to be able to stop people from accessing Twitter. That's why I'm an optimist. I think we're going to be OK.

The other point is that the entrepreneurial journey should be a journey that is accessible to all. Not only Silicon Valley, but all ecosystems would lose so much if they're not accessible. It's already not as accessible as it should be to women. It's not as accessible as it should be to minorities. It's not as accessible as it should be to immigrants. That has to change. As for Silicon Valley and other ecosystems, we have the responsibility to keep the promise that if you have an idea, if you work hard, if you have talent, then you will find the resources to build something cool.



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[1] "Stanford University's Economic Impact via Innovation and Entrepreneurship," a 2012 study by Stanford professors Charles Eesley and William F. Miller

Change lives. Change organizations. Change the world.

Kirsten Moss

Meet Stanford GSB's New Admissions Director

Kirsten Moss shares her thoughts on leadership, how to pick the best applicants, and the future of business school admissions.

Kirsten Moss wants to know what you care most about. What problems keep you up at night, and what you have done to help your community thrive. The answers to those questions help Moss, the new director of admissions at Stanford Graduate School of Business, spot future leaders who will embrace and fulfill the school's mission to change lives, change organizations, and change the world.

This isn't her first time at Stanford GSB, nor is it her first leadership role in a prestigious business program. Previously, Moss led the admissions team at Harvard Business School, where she earned a bachelor's degree in economics, government, and sociology in 1986 and her MBA in 1992. She also spent six years at Stanford GSB, working in MBA admissions, most recently under Derrick Bolton, who now is dean of admissions for Stanford's Knight-Hennessy Scholars program and whom she succeeds in her new role. She has just finished her doctorate in psychology, focusing her research on leadership assessment and development.

Moss left Stanford to join the executive search firm Egon Zehnder but maintained her close ties with the school as a leadership facilitator for the *Interpersonal Dynamics* class, more commonly known as "Touchy Feely."

We recently caught up with Moss, who began her new role on June 1.

Why did you take this job? What made you want to come back to Stanford GSB?

It is a great honor to lead the GSB admissions team, and I took the role for two reasons — its impact and meaning. The GSB mission is to create ideas that advance our understanding of management and, with those ideas, to develop leaders who change the world. I accepted this role because I think it plays a critical part in ensuring that the GSB can continue to deliver on this mission of selecting and developing leaders.

Personally, I have been focused on leadership assessment and development for the last two decades because it holds great meaning for me. I believe every individual has the potential to create positive impact; however, each of us needs the knowledge, skills, leadership ability, and support to turn our ideas into realities. I will take great pleasure in providing applicants the opportunity to join the GSB ecosystem, where they can develop their potential to change the world.

Tell us a few things about yourself you would like people to know and one that might surprise them. Although it's the third time in my career I have accepted an MBA admissions role, this time I feel more excited and prepared than ever. In prior positions, I was primarily using my instincts when selecting talent. Over the last decade, I have worked in the private sector assessing and developing senior executive leaders, obtained my doctorate in leadership psychology, and conducted my own research. I am looking forward to applying these insights and experiences at Stanford GSB.

The timing also feels right for me to accept this new role. I am married with three children and have spent a good part of my career trying to balance the challenges of working and mothering. For much of this time, the GSB has been a good home for me as its leaders, such as Derrick Bolton, have enabled me to balance these demands. Now that I have two children in college and one soon to be there, I am shifting to a new "normal" and excited to embrace all the intensive travel, marketing, and management demands that the role of assistant dean of admissions requires.

One thing to know about me is that while I love all kinds of exercise, like running, hiking, yoga, and CrossFit, I find my greatest joy in dancing. Every week, I attend dance classes, because the music, choreography, and movement make me feel most alive.

A second surprise is that my mother is British and was raised during World War II. As a child she told me many stories about how difficult it was to live in a war-torn country. As a parent, I remain grateful that my family feels safe and I can provide food for our table each night.

> **"Leadership capability is not defined by gender, ethnicity, socioeconomic status, or country of origin."**

What is it that intrigues you about working in admissions and selecting students? The thing that is most intriguing to me about working in admissions is exploring how best to make each selection decision. Leadership assessment is as much an art as it is a science. While you can rely on research and data to provide frameworks regarding what to assess, your experience and pattern recognition determine how you apply these theories in the moment.

In selecting candidates, the best predictor of future performance is past performance. We want to find candidates who have been curious and engaged in their classrooms and have been willing to voice their opinions. We also search for candidates who have had a significant impact on their organizations and communities. We are curious about what have they done, how have they done it, and what has motivated them to do it.

One of the things we ask in the GSB admissions process is "What do you value and why?" That iconic question is a window into what is most meaningful to the applicant. A leader's values are the energy, which motivates their choices, behaviors, and impact.

You've been behind the scenes of Stanford GSB and Harvard Business admissions. What changes in business school applications have you seen over time? Broadly speaking, the application process for undergraduate and graduate admissions has stayed largely the same over the past 50 years. Institutions still ask applicants for references, test scores, grades, and essays. I find this interesting, as selection practices within the private sector, though far from perfect, have evolved more rapidly and focus on measurable behaviors, which predict performance more accurately. I hope that in the future, admissions professionals can see the value in widening the lens of what we evaluate and consider data not just on what an applicant has accomplished but on how they have accomplished it.

How has your experience as a Touchy Feely facilitator influenced you and your own leadership style? Did it impact your view of effective leadership in any way? The *Interpersonal Dynamics* course is an amazing learning laboratory for anyone interested in studying leadership behaviors and development. What I have learned over the past five years is that everyone can add new leadership behaviors, or arrows to their leadership quiver, as long as they are willing to take risks to try new things that may be uncomfortable. The most successful leaders are comfortable using a wide range of behaviors more frequently than their colleagues.

I also have seen firsthand that GSB students have significant leadership capability even at an early stage of their career and develop further skills rapidly in the Touchy Feely learning environment. I often advise senior executives to attend the GSB executive education Touchy Feely class, because there are so few opportunities within organizations to experiment with using new leadership behaviors, from managing conflict to appreciating the efforts of others.

What have you learned from assessing C-suite/senior executives that influences your approach to MBA admissions? What has been most interesting to me evaluating senior leaders is that while the scope and scale of impact they have created may be larger than those of GSB applicants, how they achieve this impact is the same. The root leadership behaviors that motivate and inspire others are identical. In assessing applicants, I will be looking for a similar frequency and range of leadership behaviors that I see successful CEOs using to drive change.

Through reviewing the academic literature on leadership from over the last half-century, working within executive recruiting, and conducting my own research, I believe there are five leadership domains that encompass about 50 different leadership behaviors. First, leaders *envision* a direction for their organization by challenging assumptions, finding root cause and stimulating collaboration. Second, leaders *endeavor* to drive results by taking initiative above and beyond their responsibilities, setting challenging goals, and persisting to achieve them. Third, leaders *engage* their followers through communicating a compelling vision and influencing others to support them in their efforts. Fourth, leaders *empower* others by developing their skills and capabilities. And lastly, leaders build trust and respect through demonstrating integrity and sharing their values, concerns, vulnerabilities, and optimism. Leaders become *entrusted* because others believe in them. To be effective, senior executives need to use leadership behaviors in each of these five domains. What my research has shown is that that early career professionals also need to use the same behaviors to become high performers.

What changes would you like to see, if any, in the profile of the class? What do you think the school needs more of or less of? The profile of our class is most impacted by where we invest our outreach efforts. Under Derrick Bolton's leadership over the past decade, we have increased the number of women, minorities, and international students in the GSB class. Derrick increased class diversity through shaking the hands of hundreds of applicants across the globe annually. While I think we've made dramatic progress in those areas, there is still additional work to be done. I am looking forward to collaborating with the GSB leadership and my team to identify our outreach priorities for the future.

I do want to note, though, that intellectual curiosity and leadership capability are not defined by gender, ethnicity, socioeconomic status, or country of origin. Those who have created positive impact in their organizations and communities, no matter who they are, what they believe, or where they come from, will be strongly considered for our class.

What are you most excited about in assuming this role? I am excited to work with the new leadership team at the school, specifically Yossi Feinberg, senior associate dean for academic affairs, and Dean Jonathan Levin as they chart the next decade for the GSB. And I also am looking forward to working with the admissions team again. This team has incredible professionals with deep experience in admissions, and it will be a pleasure to work side by side with them in support of the GSB's mission.

What keeps you up at night? My responsibility is to our applicants. Over 8,000 individuals submit their personal stories to us each year, spending many hours preparing their applications. The admissions team has a responsibility to treat each of them with honor and respect. We need to ensure that our process reflects integrity and considers each applicant in a fair and consistent way. My goal is to ensure that our process embodies these values. —MARY DUAN

Toni Bird

Yossi Feinberg and Sarah Soule

Taking a Deep Dive into the Future

Two new committees study long-range shifts in faculty research and management education.

What will business school faculty be researching a decade from now, and what does the future of management education look like? These are among the questions the members of two long-range planning committees at Stanford Graduate School of Business hope to answer in the upcoming months.

“With our new administration at the Graduate School of Business, it’s a good time to take stock of where we are and begin thinking about how to move forward and remain the fabulous research faculty that we are right now,” says professor of organizational behavior Sarah Soule. She and professor of economics Andy Skrzypacz are co-chairs of the Research on Advancing Management committee. Professor of economics Yossi Feinberg and professor of accounting Anne Beyer are leading a committee examining the Future of Management Education.

Soule and Feinberg say their mandate is to gather as many potent ideas as possible from a variety of key stakeholders, including faculty, staff, alumni, and students. The insights gathered will be synthesized into a series of recommendations the committees plan to make to Jonathan Levin, who started as dean of Stanford GSB last September. The work also dovetails with the broader long-range planning under way across the entire university. (More information on that work is available here: *https://planning.stanford.edu/.*)

RESEARCH ON ADVANCING MANAGEMENT

Soule’s committee is asking faculty to weigh in on a range of questions: What topics do they expect to be researching over the next 5 to 10 years? What are the big questions that have yet to be answered in their fields? What more does the GSB need to do to support their research? How can the school better communicate their findings to a broader audience?

Students will be asked to share their experience with how research is being taught in the classroom. And since many of them are coming to Stanford GSB after having already started careers, they will be asked about what questions and ideas they have gathered from their organizations that could influence faculty research.

Even though both committees are in the early phases of their work, Soule says that trends are already emerging. “The one that keeps coming up is big data. What do we mean by big data? How do we better analyze big data? You could imagine a university-wide big data initiative, where Stanford is *the* place for computational methods in the social sciences.”

Soule says that another possible area to explore is finding ways to better collaborate with organizations for research purposes. “How can we enter into better partnerships so that we can both have access to firms’ data and do research that might be actionable for the companies that work with us?” Soule says. “Conducting experiments and using data from firms to improve them would be an opportunity to engage our alumni network and get our MBA students excited about actionable research.”

THE FUTURE OF MANAGEMENT EDUCATION

In addition to looking at the core MBA and MSx degree programs and the suite of executive education and certificate programs, Feinberg says the committee will also explore long-term opportunities and could provide recommendations for new initiatives.

“There will be things that come out of the committee that within two or three years we can make changes and implement and improve,” Feinberg says. “But the committee is really looking at long-term questions of where management education is headed and how the GSB can be best positioned to be the leader in that.”

Answering those questions and rethinking the educational experience at Stanford GSB, Feinberg says, stems from the school’s mission to develop innovative, principled, and insightful leaders. “We’re looking at this holistically. We want to educate leaders and measure success by people who impact the world in a positive way,” he says. “Let’s look at career and impact, then ask ourselves what’s the right educational experience to enable that, and what can we do to bring the best people who can leverage the educational experience?”

Both committees plan to have a series of recommendations in place in the coming months. “We’re very much in the data-gathering phase right now,” Soule says.

“Listening to the collective wisdom of people who care deeply about the school is going to give us the guiding direction,” Feinberg says, adding that they are being careful not to predict the outcome.

“It’s completely open, which is great because rather than constraining it early on we’re letting all flowers bloom,” Soule says. “And then we’ll see what bubbles up.”—IAN CHIPMAN

Yossi Feinberg is the John G. McCoy-Banc One Corporation Professor of Economics at Stanford GSB and a senior associate dean for academic affairs. Sarah Soule is the Morgridge Professor of Organizational Behavior and a senior associate dean for academic affairs.

Toni Bird

EXCHANGE

SOME FINAL THOUGHTS ON INTELLIGENCE

EDITED BY DEBORAH PETERSEN

"You're much **stronger** building a distributed set of great thinkers."
— **Reed Hastings**, Netflix founder, for *Insights*
http://stanford.io/2rmOAwu

"**Change** the thinkers into doers and the doers into thinkers."
— **Gen. Stanley McChrystal**
for View From the Top speaker series
http://stanford.io/2qlc019

"We need a cultural shift so that boys and men are comfortable with their emotions and put **relationships and community** on a higher pedestal than money, power, and possessions."
— **Jennifer Siebel Newsom**, film producer and founder of the Representation Project, MBA 2001, for *Insights*
http://stanford.io/2rmNJvz

"The feelings of **anxiety** or the lack of control seemed like a common experience as you go through the seasons of change."
— **Christine Hong**, MBA 2016,
LOWKey Notes:
The Art of Managing Life's Transitions
http://stanford.io/2r1qeFm

"**Make a list** of your own competencies. What are you great at? What are the skill sets you need to have in other people?"
— **Lindred Greer**, professor of organizational behavior, for *Insights*
http://stanford.io/2hLhiSN

"Developing **emotional intelligence** is what really makes a great leader. When you can adjust your approach for every context, only then can you truly conquer every challenge."
— **Matt Bereman**, MSx 2015,
on Facebook *#gsbinthemoment*

Read more reflections from the Class of 2015:
http://stanford.io/19RVMmF

"By being **entrepreneurial** I mean to see and seek out opportunities, to be optimistic, to be passionate, to take risks, to be leaders, and to execute and act upon your ideas."
— **Fern Mandelbaum**, lecturer in management and cofounder of Vista Venture Partners, MBA 1998, for *Insights*
http://stanford.io/2o2BWwL

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The Takeaway

THE ESSENTIALS

FIVE LESSONS FROM OUR STORIES ON INTELLIGENCE

EDITED BY STEVE HAWK

The Upside of Allowing Unauthorized Immigrants to Drive

Hit-and-run accidents declined after a California law gave undocumented residents the right to drive.

— Jens Hainmueller

Job Referrals Boost Diversity — Once You're In

People who land their jobs through social contacts are more likely to get promoted.

— Adina Sterling

Upgrade Your Firm's Organizational Intelligence

As the flow of information accelerates, managerial networks should mimic computers.

— Haim Mendelson

Beware the Overvalued Unicorn

Many of Silicon Valley's best-funded startups are valued far above their actual worth.

— Ilya Strebulaev

Laugh More

Workplace humor strengthens bonds, humanizes leaders, and leads to higher employee-retention rates.

— Jennifer Aaker

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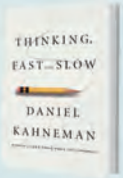

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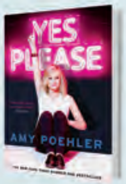

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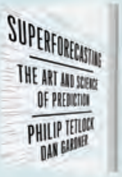
Adina Sterling



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