

WIRED PARTNERSHIP | SIEMENS

THE DIGITISED REVOLUTION

SHAPING THE FUTURE OF WORK

The automated future sounds like a scary place for humans – but with the right approach, we will all benefit

By **Janina Kugel**, CHRO and Member of the Managing Board at Siemens

The digital future offers great potential, but needs the right approach so that all will benefit. It's not the structural change alone that makes the difference – we've had industrial revolutions before and we were pretty good in dealing with them. What's new is the enormous speed of the current industrial revolution, which is being fuelled by digitalisation.

We cannot change the speed of the revolution – so we need to adapt to it. We must be agile, self-organised and flexible – organisations need

to give people more ownership and responsibility for what they are doing.

This is possible even in an industrial setting, as we were able to demonstrate at our burner manufacturing facility, based at the gas turbine factory in Berlin. Here, traditional hierarchies were smashed and workers at all levels were given the ability to self-organise their production site. Management, meanwhile, assumed the role of coaches, trusting the team to make the right decisions while keeping them accountable. The result? The burner manufacturing plant achieved a 400 per cent increase in production volume – and at half the usual costs.

Another key for success is diversity – as a global company with almost 380,000 employees, it is one of our biggest assets. It enhances our innovative strength and unleashes the potential of our employees: diverse teams prove highly capable in adapting to a changing environment, and thus contribute directly to our business success. That's why we want to make the most of our people's diversity with regard to everything from cultural background, ethnicity and origin to sexual orientation and gender identity.

The current industrial revolution is fuelled by digitalisation



We must keep ourselves up to date – both individuals and organisations

If we fail to include the broadest pool of talent, we won't be able to stay fit as an organisation – and if that happens, someone else will drive the change.

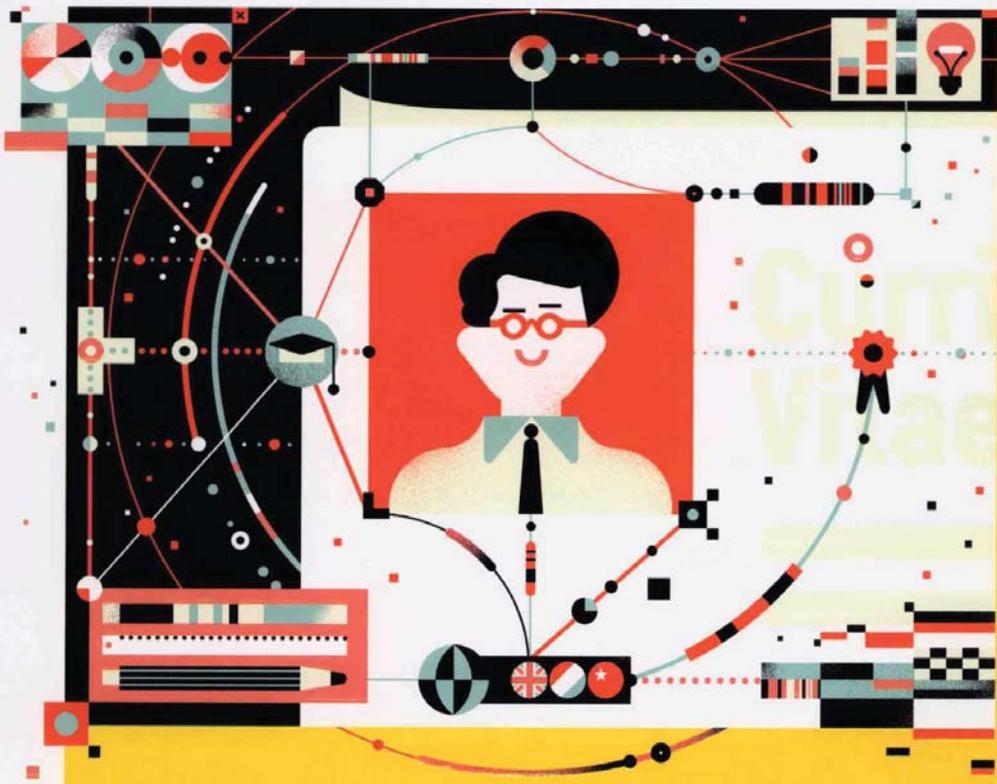
Diversity is also crucial when looking at AI. A big risk is that the people who program algorithms aren't aware of their unconscious bias and that they are working in monocultures. Only diverse teams are capable of minimising the risk of unconscious prejudices. That's why diversity is so important when it comes to AI.

Without lifelong learning, shaping the future of work will not be possible. Unless you retire within the next 12 months, you can't be sure that whatever skills you have today will be sufficient until the end of your career. If we want to retain our competitiveness and keep up with future developments, we must keep ourselves up to date – each of us individually, but also the organisations we are working in. That's why we are creating a learning organisation. Siemens already spends around €500 million a year on training and further education. Despite our best efforts, we know that we don't have all the necessary skills and intelligence in-house. Which is why we have created ecosystems that pursue external talent and actively seek partnerships with startups all over the world.

Finally, our leadership style needs to create the necessary conditions for fostering success – embracing flexibility and trust. If we humans don't begin this process, organisations will never change. [siemens.com/careers](https://www.siemens.com/careers)

Digitalisation will affect every area of human life – it will bring huge change, but for those who can adapt, there will be huge benefits

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RECRUITMENT

DEEPPAKE CANDIDATE

In the next decade, jobseekers and recruiters will pit duelling AIs, avatars and bots against each other in an effort to automate the application process. But the technology might also mean that some applicants are too good to be real – and that's because they aren't

The average person is expected to change jobs 12 times in their lifetime, and the technology industry is already responding to this demand. Applicant tracking systems are winnowing out the weakest candidates before presenting a shortlist to a human.

It means CVs must be machine-readable and SEO-friendly, says Victoria McLean of CityCV. "If it isn't, it won't even get in front of a human. CVs are now personal marketing documents –

they should present a clear case as to why you should be hired." The company provides a CV writing service, spending an hour interviewing its clients to craft a keyword-optimised resume.

Chatbots are also helping companies save time. Frustrated by the hours wasted on email correspondence with potential recruits, Ankit Somani and Sahil Sahni left their respective jobs at Google and McKinsey to found Allyo, an AI recruitment company. G4S, AT&T

and Ranstad use the service, which mimics conversations with real-life recruiters. "Having that human touch that makes it feel like a personalised process is important," says Somani. Up to four times the number of candidates who start an application complete it when done through Allyo, he claims, while the administrative burden is reduced by 20 to 40 per cent. Some firms hiring for low-skilled jobs use Allyo for their entire hiring process.

ILLUSTRATION: BRANTLEY WILSON

If AI can create an ideal CV for you, why not let it ace the interview, too?

Elsewhere, Utah-based HireVue has raised \$93 million to date to train its algorithm to interpret personality traits from candidates' facial movements during video interviews. Unilever, Goldman Sachs and IBM are all clients. PepsiCo, Ikea and L'Oréal are outsourcing recruitment to Robot Vera. A tool from Russian startup Stafory, Vera scans job sites for candidates, calls them up and interviews them via video.

Companies will have to ensure these powerful algorithms are built without human biases, in order to draw upon a diverse talent pool, but there is another danger to this increased efficiency: algorithms can be gamed.

Allyo tries to defend against this by making it difficult to reverse engineer the process. Every application has a verified identity attached to it. A person would have to create hundreds of fake identities to find out the answers to the questions that would guarantee them an interview - something that would raise a red flag in the system.

AI and chatbots could also be used by jobseekers - configured to field interviews and application emails for you. "By the late 2000s, autocompletion of online forms became the norm," says Somani. "In five to ten years, you'll see bot-to-bot conversations."

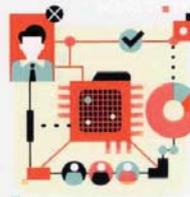
In November 2018, newsreader Zhang Zhao took to his regular spot on Chinese state news agency Xinhua, same as usual. Then he began to speak. In robotic English, the world's first AI news reader, Qiu Hao, modelled on Zhao, got to work. This is an innocent example of Deepfaking, which is more broadly used for embarrassing celebrities, but the job hunting market could utilise its principles. Startups such as Los Angeles' Pinscreen and Montreal's Lyrebird are already working on mimicking your facial features from photos, and your voice from short sound files. Pasadena-based ObEN creates a 3D avatar that can step in for everyday tasks. Recruiters that outsource to AI to save time and money, will be forced to innovate counterattacks to identify when candidates are doing the same. Or, it will be a case of whomever has the best tech, wins.



90%

Reduction in hire time

Hilton introduced video-interview monitoring service HireVue, and saw the time it took to hire employees plummet.



56%

Want to use new interviewing tools

9,000 HR professionals told LinkedIn new interviewing tools, including AI, are "very" or "extremely" important to their hiring process.

MAN VS MACHINE

The AI revolution will work best when it complements human skills, and future jobs will rely on humans utilising unique assets such as creativity and empathy

There are three myths about the future of work, according to Daniel Susskind, fellow in economics at Balliol College and co-author of *The Future of the Professions*.

The first is the Terminator myth, which says machines will displace people. "They also complement or enhance people - like GPS for a cab driver," Susskind explains.

The second is the intelligence myth, which says that machines have to outperform us. "Huge increases in processing power and data storage means that machines can decide if a freckle is cancerous without knowing anything about medicine," says Susskind.

The final myth debunks the lump of labour fallacy - that improving technology will create new jobs. "Machines may be best placed to do the new tasks," Susskind points out.

Where machines struggle, however, is with things we humans find easy to do with our hands, from caring to creating, he explains. "A few decades ago, automatic car-washes were everywhere. Now it's groups of people working for a lower wage washing cars faster and better. And until they invent artificial empathy, machines will find it harder to help people."

Our direction of travel is towards technological unemployment - unless we develop creative skills, from artistic to engineering, that AIs can't yet replicate. "AI doesn't have imagination," Susskind says.

"We've been struggling to grow the economic pie for thousands of years - and now we have solved it," he explains. "The problem now is how can everyone get a slice?"

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12%

How much harder happy people work

Researchers at the [University of Warwick](#) revealed happy employees are 12 per cent more productive than less fulfilled colleagues.



8.5%

Employee productivity boost from Wearable technologies

Researchers at Goldsmiths, the [University of London](#), found wearable devices can boost productivity by 8.5 per cent.

AUTOMATION FOR THE PEOPLE

AI can be used to augment the effectiveness of human workers – from nudges that rebalance workloads, to freeing up time for creative thinking

Robots aren't coming for your job – they're actually coming to help. In the future, work will be augmented, with robots, chatbots, artificial intelligence, virtual and augmented reality helping us do our jobs more effectively and making work more fulfilling.

Whether your role is in an office or on a factory floor, these technologies will become as commonplace and integral to your job as computers are today. But this doesn't mean buying a bunch of VR headsets will save a company from being left behind. Instead, emerging technologies should only be used to address specific problems. Artificial intelligence won't run entire newsrooms, for example, but rather take on small tasks, such as the Financial Times' source-scanning bot that looks for gender balance in stories. At Disney, bots are already looking for dead pixels on-screen, saving staff time so they can focus on creative work. "Eventually, they'll have hundreds of bots that are part of an ecosystem of support," says Chris Brauer, director of innovation at the Institute for Management Studies at Goldsmiths, University of London. "That helps them to focus on the interesting aspects of their jobs."

HR departments have moved on from focusing on the innovations themselves and the potential for job losses, to effectively reskilling employees so they can work alongside emerging technologies. "It's evolved fully into a discussion about augmented

workforces, and how to get the most out of your technology and your people simultaneously," says Brauer. Ensuring the tech solves a problem, rather than creating a whole host of new ones for its workforce, requires continuous experimentation. Rigorous pilots with key employees not only help predict the outcome of using AI or VR in the office, but how it will impact upon staff. It ensures evidence for such change, but also helps slow the pace of that change, so the process doesn't overwhelm the workforce. And you might well find a cutting-edge, overhyped technology doesn't actually work better than the systems you currently have in place.

In short, all companies and their staff will need to get better at learning and experimentation. "A great company is a great university," says Jian Jun Hu, chief cybersecurity officer at Siemens China. Trying new technologies to build this augmented workforce will require leadership to guide the learning, accept some trials won't work out, and not fear failure. "We need to attract more leaders and talents who keep the curiosity to learn and dare to try in an agile way, especially with new or interdisciplinary subjects," he adds.

Machine learning and automation will enable internal experiments, too. HR startup Humu takes the psychology around change management and nudge theory – that behavioural change can be achieved via positive reinforcement – and applies it using digital notifications.

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Your most valued colleague could be an AI – they'll take on the boring tasks, so you've got more time to focus on what matters



Humu co-founder Jessie Wisdom is an ex-Googler with a PhD in behavioural economics, and has spent years working on projects designed to help people make better decisions. "Anyone who has been part of any organisation knows that change is a big challenge - and even the best intentions to make work better are often met with resistance," she says. "People don't tend to like to change - it's one of the most fundamental management challenges."

To help, Humu uses small, personalised recommendations, or "nudges". Data is first pulled in from Humu's own personalised surveys and combined with existing corporate data. Algorithms use this to identify which teams need to work on what, to achieve a targeted change. This could range from increasing productivity to encouraging diversity and inclusivity. Nudges are then sent out to prompt

behaviour change - an email reminding an overworked manager to go home on time, or a notification in a messaging app asking a staffer to share their thoughts on a meeting.

Services like this may help managers discover whether their staff are indeed unhappy with automation, or enjoying its potential benefits. "One of the places where technology can really help is through automating away the things that get in the way of people finding meaning or fulfilment in their job, and giving them more time to actually focus on the things that matter for them," Wisdom says. "As more and more of our jobs become automated, the relationships become really important, and a lot of what we do is help build relationships between people."

The augmented workplace of the future isn't just one filled with robots and VR. It'll be better for humans, too.

'It's a discussion about getting the most out of technology and people'

CHRIS BRAUER
 DIRECTOR OF INNOVATION, GOLDSMITHS

ILLUSTRATION: GIACOMO BALUZZA



7.2m

Number of jobs AI will create

AI will automate 7m jobs over the next 20 years - but also create 7.2m, PwC says.



\$20.4b

2019 forecast for spending on AR and VR

IDC predicts a 68 per cent leap in spending on AR and VR in 2019, led mainly by business uses.

THE FUTURE OF THE WORKPLACE

Organisations need to plan for a flexible, collaborative workforce

In the real world, evolution at work is rarely simple. A change in hierarchy or a new administrative system can force a team to spend months adapting. But what if your company decides to operate without physical headquarters, or implements a policy of working from home, or swaps desktop computers for augmented reality headsets?

Companies can prepare their infrastructure for the future, and many are already building drone landing-pads on rooftops and equipping every meeting room with collaborative smartboards.

But integral to all these changes ultimately being positive, are the people and teams that implement them. Siemens' FutureMakers initiative highlights just that. Among the 380,000 staff are mathematicians using artificial intelligence to detect cancer faster, engineers helping entire cities adapt to changing energy demands, and architects designing our future networks and interactions. Beyond the new hardware, collaborative tech tools and AI assistants, there is one theme that binds anyone working in this sphere: flexibility. And not just for clients – customer-centricity is a necessity in a competitive environment – but for employees. Jobs, working hours, working locations – anything that impacts the employee can be flexible and adaptable. Given a happy employee works 12 per cent harder, according to economists at the [University of Warwick](#), this is not surprising.

Here are three of Siemens' FutureMakers syncing people and technologies to make change work.



Aleshia Eckard, who is designing people-led spaces

ALESHIA ECKHARD

In a competitive future market, organisations must offer adaptability to both jobseekers and employees

Office design in the future will not follow trends. Instead, each business will build their organisation based on flexibility and adaptability.

"We've seen cubicles and we've seen no walls," says Aleshia Eckard, digital excellence architect for Siemens. "Virtual working has its pros and cons. The future is tailored space, because people are different and they all work differently. Businesses will conform to people, not individuals to a work space."

Personal computing combined with rises in the cost of prime real estate made virtual working attractive to young talent. But it does not work for everyone. "The best work environments have been creative ecosystems that are both physical and virtual," say Eckard. "I love working virtually, but it's good to go into an office and share ideas."

Eckard, a trained architect, is used to taking a creative and logical approach to improving systems - includes the workforce itself and its physical environment. That environment, she says, must change based on what people need. Many organisations will still have campus-style HQs - "these will become grander and community driven" - but still retain smaller, satellite campuses. Interactive community spaces will be important, as will green spaces, quiet spaces, private rooms, group spaces for problem solving, and virtual spaces that are fitted with the best audiovisual equipment, enabling colleagues to read each others' expressions better.

Flexibility must also extend to

schedules. "Work has to work for both those a 20-minute walk from the office, and living an hour away."

Siemens has partnered with the Tech Square ATL membership community to give Siemens employees access to The Garage, an 800m² co-working space located adjacent to Georgia Tech in the heart of Atlanta's tech scene. "Siemens employees will be able to go there, have a coffee, save on their carbon footprint and interact with younger talent, which is great for knowledge exchange and recruitment." A growing population, increasing traffic and slow progress on mass transit will impede recruitment. "But if we can get an office space close to them and to new transport, we can get talent faster than other companies." Flexibility and adaptability is not just about employee retention. In a competitive future, no jobseeker will settle for anything less than exactly what they are looking for.

'The future is tailored space, because people are different'

**ALESHIA
ECKHARD**
DIGITAL EXCELLENCE
ARCHITECT, SIEMENS

Rosa Riera is ensuring that Siemens is in a position to recruit top talent that is more demanding and questioning than ever before



ROSA RIERA

To boost hiring, innovation and your company's future, rethink the employee experience

How do you improve your hiring, boost innovation, and bring your company into the future? By totally reworking the employee experience. Rosa Riera, vice president employer branding and social innovation at Siemens, believes companies should be employee-first and use digital technologies to offer a personalised approach to hiring and employment.

"The thing with many big brands is that over time there are shifts in the talent market in terms of what people want from an employer," says Riera. Previously, talent would flock to a well-known, global brand like Siemens. "They provided many elements that people couldn't get anywhere else, like working in a global environment and access to development opportunities," she before explains. "And we benefited from this for a long time."

Startup culture has changed that. Now, top talent wants flexibility, flat hierarchy and purpose-driven work. "They don't associate these things with big companies," she says, even if that's not accurate. Her own employer, she notes, offers flexible working, innovation labs, and opportunities for personal and professional growth. To highlight the diversity of working environments, cultures, and sites, Siemens even created short VR documentaries that show what it's like to work in other parts of the organisation.

Top talent also ignores corporate messages in favour of conversations with people who work at a company already. Social media and employer rating sites such as Glassdoor have become important sources of information about an employer. "People are much more likely to ask

more specific questions before they start somewhere," Riera says. At the core of Riera's work is the employee experience, bringing together culture, technology and the work environment. "It's not just an HR thing," she says. "It's our job to think ahead, and then collaborate with different departments and functions to help drive the culture in a way that enhances the employer brand." One focus is diversity, which widens the talent pool and favours innovative thinking: "The way we worked in the past will probably not help us solve the issues of the future."

Such change isn't easy. Ensuring existing staff are brought along for the ride is part of the work, Riera explains. "Dialogue is important," she says, adding that Siemens holds town-hall style meetings, and uses an internal social network and tools such as Slack to communicate and share. Executives and board members have even taken to social media: "They share what they're working on and what they care about." That helps make the company's direction clearer to staff, and also encourages them to speak up. "It makes it clear that it's allowed and desirable to share and talk about your jobs. The beautiful thing that is if you focus on people, the chances are high that talent will react positively."

**'There's a shift
in what people
want from
employers'**

ROSA RIERA
VICE PRESIDENT, EMPLOYER
BRANDING AND SOCIAL
INNOVATION, SIEMENS

PETER SCHOPF

Combining AR with the Internet of Things could empower industrial workers with real-time data that adapts before their very eyes



Peter Schopf, Head of Mid-Market Account Executives for Siemens' IoT platform MindSphere, is building systems that will enable engineers to combine data and collaborate easily

How do you ensure the beer never runs dry at an event like Oktoberfest? Embed every keg with a secure sensor, connect those sensors to your analytics platform, and the emerging patterns will allow organisers to allocate resources based on demand.

This is MindSphere, Siemens' Internet of Things platform for industry. Industry will rely on simulations like these, augmented reality and big data analytics to advance and remain competitive, says Peter Schopf, MindSphere senior manager in business development and strategy.

"Holograms will be flying around so engineers can compare technical drawings to the real model, overlapping them to check differences and make annotations. Right now, people look up data on smartphones or tablets - how much more intuitive would it be if you could visualise sensor data in AR?"

If all this sounds familiar, that's because it's a use-case Microsoft put forward with its HoloLens mixed reality headset back in 2016. Without an IoT platform easy enough for companies to use, however, that future has been just out of reach.

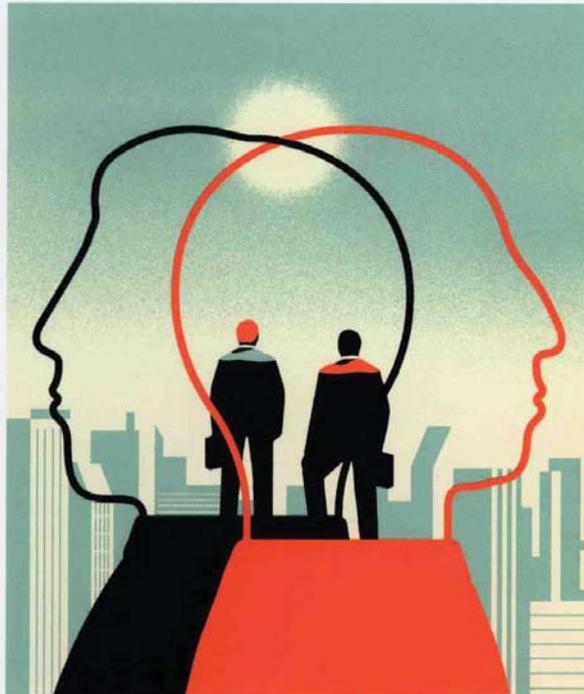
There are obvious efficiency and cost benefits to working this way - MindSphere is already being used for "predictive maintenance", allowing engineers to combine data from a range of locations and sources, visualise it, and see where faults might occur. "We need to give customers the benefit of interacting seamlessly with the industrial IoT - AR is key to that," says Schopf.

Anyone with basic knowledge of MindSphere has the ability to create simple graphs and diagrams. But Siemens and other partners are producing apps for the open ecosystem, and Siemens' acquisition of app-building and testing platform Mendix, which it bought for \$730 million in October 2018, will speed this up. The goal is to have a platform that can easily structure any type of data, from any machine, for easy plug-and-play cross-collaborations.

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DO IT WITH FEELING

Empathy is the key element in nurturing a creative, inspiring and thriving workplace



Getting inside the heads of people outside your typical range of experience is beneficial for all – and especially so for businesses

As automation spreads, human skills like empathy will give employees and leaders an advantage, according to Adam Grant, organisational psychologist at the Wharton School of the University of Pennsylvania and author of *Give and Take*.

“Put yourself in situations where you meet the people who benefit from your work – be that software, cars or engineering projects. It’s one thing to know your work has impact. It’s a really powerful thing to understand what that impact is.”

He has found that empathy makes you more creative. “If you don’t have concern for others when trying to solve a problem, you pick your own

favourite idea rather than the more innovative solution,” he explains. A company that fosters empathy in its staff will find employees work harder and longer – “When you care about other people, you set the bar higher.”

He has spent the past year researching work environments, from hedge funds to a tomato paste company, to understand how leaders relate to insiders and to outsiders. The key to success, he believes, is to practice getting into the heads of other people. “But don’t get into the heads of people you already know,” he insists. “They think like you anyway. You should get into the heads of the outside group.”

He cites a colleague running a Men Can Stop Rape programme, to get men to empathise with women who are attacked. “The men got very defensive,” says Grant. “So he asked them to reflect on ways they’d been stereotyped and treated unfairly and what pressure they suffered as a result. After that, it was far easier for the men to feel empathy. When we think about ourselves as the target, it becomes very real.”

Grant has found that men and women have the same capacity for empathy, despite its stereotyping as a female trait. Work from William Ickes at the University of Texas found that women did outperform men on a test of empathy – but only when told this was a test of empathy. “If you frame the same questions as a study of problem-solving, the gender difference vanishes,” says Grant. “We all have the capacity, but we don’t realise it is relevant.”

Why should future leaders care about this? Good empathy makes for better leaders – inspiring followers or eliciting loyalty are less useful than knowing your customers’ and employees’ desires, and the risks they are willing to take.

“Goodwill to others falls under two main categories,” Grant argues. “There’s benevolence, which is about caring for friends and family, and universalism, which is about caring for everyone. Most societies lean towards benevolence. If we’re going to grow as leaders, employees or people we need to strengthen the universal. Travel to cultures that are different to your own. Help people who have less power than you do.”

ILLUSTRATION: STEPHEN PLAGIARDO