#beyondwork

TABLE OF CONTENTS

BUSINESS

POLITICS

SCIENCE

SOCIETY

SYMPOSIUM

EDITORIAL

Dear Reader,

The magazine in front of you is the product of many hours of labour. Human labour. A diverse team of ten student journalists, three photographers, two International Students' Committee alumni, two designers, two senior editors, one online editor, and ourselves – the editor in chief and magazine project manager – worked hard to put this together. We explored the 48th St. Gallen Symposium's topic "Beyond the end of work" in various ways, through the viewpoints of the symposium's Leaders of Today, Aspiring Leaders and Leaders of Tomorrow.

Over the course of this event, we have been wondering if the magazine itself could ever be automated. Or even the symposium as a whole. It is highly unlikely, although it would save a lot of coffee. Both the Magazine team and ISC Team have such a variety of tasks, many of which require both machines and a decidedly "human touch." One of their most important assignments is to enable the St. Gallen Symposium conversation, which often starts in the car on the way to the campus. Artificial intelligence may one day become a good conversation partner, but it will still not come anywhere near one of the organisers or one of the journalists themselves.

In many ways, this year's symposium boiled down to the question: What do we have to fear from technology? This magazine contains several answers to exactly that. In here, you will discover what other jobs are future-proof. It also contains everything you ever wanted to know about robots. And do take a look at our stories on the challenges for the global labour force of the future, about diversity in AI, and about how machines can help us deal with loneliness. For even more conversation-stimulating ideas – (hardly any) algorithms involved – be sure to go to: www.symposium.org/magazine and keep discussing via #beyondwork.

On behalf of the Magazine team and the 48th International Students' Committee, we would like to thank you for participating in, debating at, and committing to the St. Gallen Symposium.

With kind regards,

RUBEN DIELEMAN
EDITOR IN CHIEF

LOÏC FAVRE
MAGAZINE PROJECT MANAGER


BUSINESS

CASSANDRA? – Economic theorist Jeremy Rifkin popularised the idea of the end of work. However, he says he is neither a prophet nor a pop star.

KALENDRA WITHANAARACHCHI & SEBASTIAN BEUG (TEXT)
LUKAS RAPP (PHOTO)
KATIE CHAPPELL (ILLUSTRATION)

"WORKERS ARE NOW UNDER THREAT."

Jeremy Rifkin

Jeremy Rifkin, 73 and born in Denver, Colorado, is a man of many occupations. He is a socio-economic theorist, an activist, a political advisor and the president of the Foundation on Economic Trends; a non-profit organisation whose goal is to examine and assess the implications of modern-day trends in science and technology. Rifkin is the author of 20 best-selling books, such as "The Zero Marginal Cost Society" (2014) and "The Third Industrial Revolution" (2011). In his earlier years, he initiated a protest against oil companies in 1973, and launched a campaign against beef consumption in 1993. Rifkin works in Bethesda, Maryland, a suburb of Washington D.C.

Jeremy Rifkin makes ideas popular. So popular that the 48th St. Gallen Symposium was partly inspired by one of his most well-known books. The symposium's title – "Beyond the end of work" – is reminiscent of his famous book, "The End of Work," published in 1995. He has also developed ideas like the Third Industrial Revolution and the Zero Marginal Cost society. He is not just a best-selling author and a theorist: Rifkin is also an activist and a political advisor. At the symposium, Rifkin explained how he comes up with new ideas, why he would advise any country on earth, and why he does not want to retire soon.

How does it feel to have a complete symposium tailored to your ideas?
Well, I think a lot of us are coming to these ideas at the same time.

Keynes had similar ideas seven decades ago.
Keynes addressed the issue of how you deal with technological displacement. He said we were going to have to re-envision what kind of contributions people make to the world: Let the machines do the heavy lifting, so we do not have to. There is always something constructive for the human race to do. What he was suggesting was that we create our humanity, we create social capital, and we learn to live together around this planet. There are many things left undone. If we can let machines do the things that we do not need to, that is fine.

You published "The End of Work" in 1995. Now many of its predictions are coming true. Do you consider yourself to be a prophet?
No. You did not have to be clairvoyant to see this situation coming. I said at that time that automation was affecting factory work and now white-collar work. As we move towards the third industrial revolution, we are seeing that knowledge workers and creative workers are under threat because of the introduction of digital technology and computer software. That was already happening in 1995.

Also, the foreword of "The End of Work" was done by Robert Heilbroner, a great economist. And Vassily Leontief, the great Nobel Laureate, did the comment inside. They were already talking ↦

about this before me. I am just part of a string that emerged in the 1960s with digital technology.

The question of automation really started with Norbert Wiener in cybernetics, and then Walter Reuther and the unions and then economists Heilbroner and Leontief. By 1995, we were already starting to see these issues explode onto the social scene.

You mention people and ideas from economic history to which you are referring. How do you develop your ideas for books?
I am a lifelong activist, but I also teach, and I write. I think if one is just an activist, without doing any kind of intellectual homework, it is easy to get buried. If one is an intellectual in the ivory tower preparing books and materials that have no relationship with or active involvement in the community, the challenge is appraising what is really happening in the world.

Speaking of activism, Vice Media made a film about you and your work which was screened at the Tribeca Film Festival. Are you a pop star?
No. Do I look like one? I am 73 years old. I have been doing this for a long time: Three generations now. There are people I meet who think I am already dead, because they read my books 40 or 50 years ago. It is a long time. It is a matter of just hanging in there and realising the fundamental changes we talk about take at least three generations. Sometimes it is difficult saying the same things over and over again. But one generation may have heard it and you may still need to tell the story again for the next generation.

Your consulting work for governments is non-profit, is that right?
Sometimes I do it for free, sometimes I do it for small fees that are not commensurate with corporate fees. For example, I am doing the European Business Summit in June. We did a strategic study on the third industrial revolution for the Grand Duchy of Luxemburg.

Are there countries or regions you would not advise? What if North Korea would ask for your advice?
It depends. What I would say is, we consult for centre-right and centre-left governments. I would like to see everyone in the world moving to this narrative and this transformation. I know there will be different approaches, there will be things that they do not want to do that I would like them to do. The important thing is that we have got to get a transition across humanity to this post-carbon, digitally-connected, hybrid network capitalist-sharing economy very quickly.

How do you feel if your clients – especially governments – do not take your advice?
We had some earlier projects where the government changed hands. We had a nice plan for Rome, for example, and then the city government changed hands and it did not happen. There was really a lot of work done on that. Our plan for San Antonio went well. They changed their whole model away from fossil fuels and nuclear to solar and wind.

Right now the US government is not focusing on reducing carbon emissions. Does that make you sad?
I do not spend any time thinking about what the federal government in the United States does. I did go to Congress to talk to folks there. If someone running for office wants to talk to me, I will talk to them. If a city or a region or a state government comes to us, we will work with them. We are now starting to focus on North America. Our plans for Europe are moving forward. We have China as a client and that is moving forward too. I would like to move to the United States, Canada, and Mexico next. And India for sure. In fact we are about to announce the first major strategic fossil fuel to renewables transition plan in North America shortly.

You are writing about the end of work, and the symposium is about the end of work. However, you are about ten years past retirement age. Do you plan to stop working at some point?
I would like to ease off a little bit, especially the travelling. I enjoy doing the research and the books, to tell you the truth.

Are you a little bit addicted to work?
I feel compelled. Given the situation that is going on in the world, it is really tough to say no. It is pretty bad out there, what is happening. On the other hand, I am becoming aware of my health. I would probably like to do a little bit less. That is why I am hoping that other people will come on board. ◆

FUTURE FACTOR: BUSINESS

CECILIA ARREGUI (TEXT)
LUKAS RAPP & TOBIAS SCHREINER (PHOTO)

Ryan Piela

Before going to business school, Ryan Piela worked in the non-profit humanitarian aid sector. Now he is about to graduate with an MBA from New York University's Stern School of Business, after which he will take a job helping companies incorporate blockchain into their businesses. Although he insists he is not wearing "rose-coloured glasses," Piela has faith in the human ability to adapt. "The coolest thing will be the trickle-down effect," he says. "It may be the McKinseys and IBMs using these technologies now, but as they become cheaper and more accessible, I am curious to see what developing nations are going to come up with. It is probably going to be much more creative in terms of helping other people."

Rosmiyana Rosmiyana

Rosmiyana Rosmiyana is pursuing a double MBA at Nanyang Technological University in Singapore and Waseda Business School in Tokyo. From her viewpoint, previous Industrial Revolutions offer relevant lessons for people today. "Instead of a battle, synergy between humans and machines is a better option to reach a balanced world that is good for everyone," she says. "That way, people will get to do more meaningful things." Rosmiyana, who was born in Indonesia, thinks the future of business is going to be even better than today, and hopes that positivity in her field is not as rare as it sometimes seems.

Nikolaos Molyndris

Besides studying for a Master's Degree in Strategy and International Management at the University of St. Gallen, Nikolaos Molyndris works for Visium SNC, an AI consultancy start-up based in Lausanne. In order to adapt in the future, the Greek student knows he needs to be holistically educated: Instead of learning how to perfectly execute a specific task, a multidisciplinary approach that includes proactive thinking about strategy will help keep him relevant regardless of how his field changes. "Whether we want it or not, businesses are soon going to be much more automated. Fear does not help," Molyndris says. "For me it is mostly about trying my best to influence the future so that it turns out to be a good scenario and not a bad one."

Stijn Antonisse with his Somnox

People have been making money by exploiting human emotions since the dawn of time, and loneliness is no exception.

The Industrial Revolution – which saw people leaving their families and farms to move to cities in search of greener pastures, created a whole new market niche, says Shivangi Singh, a Leader of Tomorrow at the 48th St. Gallen Symposium and Young India Fellow at Ashoka University. "Loneliness hit them, and nightclubs appeared in response to that," she says. "When you spend ten to twelve hours at work, what do you do when you are bored?"

More than 200 years later, we're still lonely – in fact, globalisation only seems to have made the problem worse. And there's even evidence loneliness is a public health threat. A study in 2016 found loneliness meant a 29% increased risk of coronary heart disease and a 32% greater risk of having a stroke. "Loneliness is a public health concern," says Daniel Sawyer, one of the top student competitors of this year's St. Gallen Wings of Excellence Award and a bioengineering doctoral student at Caltech.

In Japan, one of the world's most rapidly ageing societies, entrepreneurs seem to be finding innovative, albeit controversial, ways of providing companionship for their "kozoku" – loosely translated, the tribe of lonely people. Their solution: AI.

This year, Sony re-released their extremely popular companion-bot Aibo – first put on the market 20 years ago, then discontinued. "Sony was once really sensitive to how people can attach emotions to robotics," says Hiroaki Kitano, the CEO of Sony Computer Laboratories and Aibo's creator.

Only the lonely

Aibo's initial reception astounded the company, and Kitano himself. "People were very much more attached than we expected. It was overwhelming," says Kitano. "That became a problem when we discontinued it. People were very upset."

But is it only the lonely who seek out companion-bots? "There are people who would not be able to have a real dog for a range of reasons, but still wish to have companions at home," Kitano says. "We

"SIRI, DID YOU MISS ME?"

LONELINESS – AI and robotics are increasingly being used in consumer markets as means for companionship. With international statistics showing that people around the world are growing increasingly lonely, loneliness may be a factor funding the AI industry. But is it accurate to assume that, in return, AI is treating the loneliness epidemic?

KIZZY BRAY (TEXT)
TOBIAS SCHREINER (PHOTO)

started thinking could we use it for therapy, for nursing homes, for these people and their emotional involvement."

Two decades on, Kitano is far more skeptical when it comes to companion-bots as the remedy to the epidemic of loneliness, "Frankly, I do not think AI could necessarily solve the problem," he says. "A robot may be able to assist humans, or temporarily play some role in interpersonal relationships, but it will not solve the problems behind it."

AI to facilitate conversation? Sounds like something Daniel Sawyer might have pitched. His idea – to create a device that reads and translates empathy between two people – sparked a lot of conversation, even if the technology doesn't exist (yet).

Hug a robot

Such a device could help the lonely. "It is hard to prescribe someone friends," Sawyer says. "Research on loneliness shows it can be about misinterpretation of social cues." So if we had something to prevent this misinterpretation, quite possibly, we would not be as lonely?

But are we not really just missing the point of it all? Loneliness is a social issue, as well as a medical one. Do we not need contact with people, rather than machines? And is it dangerous to replace human relationships with robotic ones? Singh fears a reliance on robotics for emotional support would lead to people "losing their social skills," skills which are "very essential to long term human survival."

Techno-optimists think such concerns are overblown. Dutch inventor Stijn Antonisse, the creator of "Sonax," a huggable robot the inventor claims helps you sleep, thinks that we now have the ability to give lonely people some immediate help in the form of robotics. So "why not?" he asks.

Leader of Tomorrow Vu Huynh believes we are looking at robots the wrong way. "We do not have to give them a human identity," she says. "We know we have a smart TV, a smart fridge, and now we have a robot." If we do not conceptualise the robot as a person, then fears of robots replacing human relationships become less dramatic. After all, have you not been ignoring your friends' Thursday night dinner invitations in favour of your favourite TV show for years?

So: If you cannot sleep, you can hug a robot with a mechanical beating heart inside. If you are lonely, you can pet your Aibo. And if you cannot prescribe someone friends, is giving them a companion-bot really all that bad?

Whatever the answers are, discussing possible fixes for this epidemic of loneliness – either through the human touch, medicalisation or a furless dog-bot – at least shows we are taking this public health concern as seriously as we should. ◆

FUTUREPROOF – Artificial intelligence is expected to put millions of people out of work. Is anybody safe from the robot wave? Here are four occupations machines will have a tough time replacing.

JON MARTÍN-CULLELL (TEXT)
KATIE CHAPPELL (ILLUSTRATIONS)

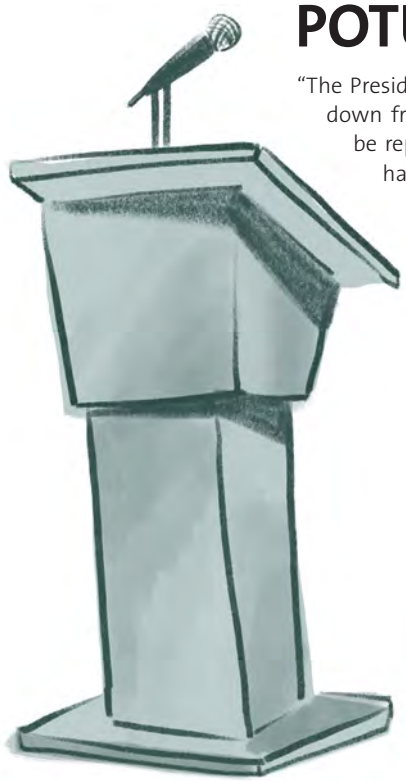
NO ROBOTS NEED APPLY

If you earn your living by playing music, waging war, gardening or driving a car, watch your back! The "robots are coming for your jobs" mantra hovered over the symposium for three days, and participants had to deal with a disturbing thought: "What if I am soon replaced by a set of cables and buttons named Tom?" All jobs could be automated sooner or later. The good news is that certain occupations will stay out of Tom's reach for still some time.

CLEANING LADY

Yes, cleaning ladies. There is a widespread belief that jobs requiring physical labour will be the first to fall into robotic hands. However, there are exceptions. Using the vacuum cleaner, arranging books, picking up toys from the floor, and cooking pasta is, for now, too much for one robot to take on. "Paradoxically, automation will not get to the cleaning ladies for many years," says leading AI researcher Dileep George. "We can envision single-purpose robots for specific tasks, but we have not yet developed the technology to face variable situations and multiple activities."

An all-encompassing cleaning robot is not yet technically feasible; it might not be wanted, even if it existed. In the '50s, sociologist Warner Bloomberg conceived of a fully-automated home-based roasting process. As explained in a study conducted by Anna Salomons from Utrecht University and David Autor from MIT, the idea never took off. "No matter how intelligent new technologies are, if they do not generate human demand, they become smart garbage," University of St. Gallen business Professor Caspar Hirschi wrote in an essay for Primer, a collection of background pieces prepared for the 48th St. Gallen Symposium and available online.



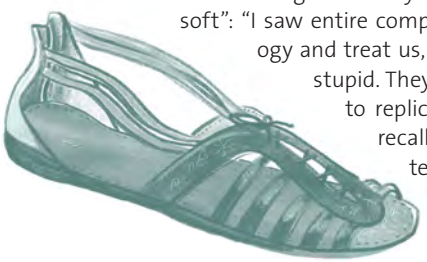
POTUS ET AL.

"The President of the United States," someone who used to work one door down from the Oval Office answered when asked which job will never be replaced by robots. His differences with Barack Obama's successor have not changed the views of Denis McDonough, Obama's former chief of staff: A robot cannot be trusted with the nuclear codes. "Politicians are safe, provided they do uniquely human things," he laughs. "Cognitive things? That is a different question."

Even if a robot capable of dealing with the unpredictability of politics was invented, would people vote for him? "Robots can lead to augmented decision making, but I do not think we would ever accept being governed by them," argues Chlöe Swarbrick, the youngest member of the New Zealand Parliament. "If the robot gets it wrong, who would you blame? The robot?"

HUARACHE MAKER

Huaracheros (traditional Mexican shoemakers) design and make huaraches, hand-crafted leather sandals whose design predates Columbus' arrival in the Americas. "Each *huarache* is different. They are valuable, because they are unique and have a story behind them," explains Celia Ramírez, who coordinates a centre for entrepreneurship in Jalisco, Western Mexico. She is now training a group of women to upscale their production of *huaraches*, increasingly popular among trendy young people. Bob Bland, fashion designer and founder of the Women's March, also points at the challenges faced by robots when working with "anything soft": "I saw entire companies come in with all this technology and treat us, fashion professionals, as if we were stupid. They came to see that it was not possible to replicate what the humans were doing," recalls Bland, "and certainly for artisanal techniques it is even more so. I have yet to see a robot able to sew a simple dress."



INTELLECTUAL

The Cambridge dictionary defines an intellectual as "a person whose life or work centres around the study or use of ideas, such as in teaching or writing." Could a robot ever be a recipient of a Nobel Prize in Literature? For John Ralston Saul, one of Canada's most prominent thinkers and a former president of PEN International, the answer is a clear no: "Machines are irrelevant. They are basically shards of memory, that interweave elements and try to draw conclusions," Saul points out. "But they are completely missing the mutability of imagination, and the nature of intuition and common sense."

An intellectual defending the relevance of intellectuals is no surprise, some would argue. Yet Akash Gupta, founder of GreyOrange, an Indian start-up in the field of robotics, also acknowledges the limitations of the machines he creates. "Robots might be able to have conversations, but these will be very objective, not emotional. That will be very hard to achieve," he admits. Intellectuals can breathe a sigh of relief.

SHARP EYES – Chief Visionary Officer is a rare job title. One of its holders is Kim Sung-Joo, founder of Sungjoo Group, a multinational fashion business.

JON MARTÍN-CULLELL (TEXT)
TOBIAS SCHREINER (PHOTO)

LETTING VISION TAKE CHARGE

When vision has a desk

The word vision has a biblical ring to it, evoking people crossing deserts and seas in search of unknown land. Or, mutatis mutandis, in search of a new solution – an app, a vaccine, a robot – to human needs. For Kim Sung-Joo, vision is not only a necessity in today's increasingly automated world, it is also her job. She is the Chief Visionary Officer (CVO) of the Sungjoo Group, a multinational fashion business with 500 shops and 15,000 employees around the world. Her motto and that of her company is "Faith, Hope, Love," based on her Christian beliefs. "My vision comes from God," she says.

Despite being a frequent attendee at CEO-heavy and male-dominated business summits like the World Economic Forum in Davos, which she first attended as a Young Global Leader in 1997, she continues to stick out. The only CVO in attendance at the St. Gallen Symposium, she wears sneakers and jogging pants. The informal dress code puts her in line with some of today's most famous visionaries, often dressed in hoodies à la Zuckerberg. During the Circle of Benefactors Dinner "all the men were looking at me – 'how dare she?'" she laughs.

The visionary method

Kim, a scion of one of the country's leading *chaebol* (industrial conglomerates) families, defied her father's reluctance for her to enter business. She founded her company in 1990 and brought brands like Gucci and Marks & Spencer into South Korea. The turning point in her career came in 2005, when she bought MCM Holding, a German luxury brand. "I had no idea what to do, but I was convinced I could do it," she says. "In the last ten years, Sungjoo Group has grown ten times bigger."

Her method sounds simple. Every morning, she reads the Bible and prays. "I become Braveheart. Without praying I cannot be focused and, if you are not focused, you cannot see clearly." And, it goes without saying, if you do not see clearly, you cannot be a CVO. Next comes what she calls a "global macro view," which gets reflected in a "microscopic action plan," thanks to a "collective effort."

Four years ago, Kim felt her company was growing too fast. She took a step back and became head of the Korean Red Cross. The South Korean CVO claims that money is just "a tool to serve society." "The Protestant Ethic and the Spirit of Capitalism" by German sociologist Max Weber is her other "lifelong book," besides the Bible. "Now, I am back and we are growing at 40-45% again." The Sungjoo Group is currently going through a three-year long process of digital transformation to upgrade its e-commerce business and adapt to the new dynamics in the fashion industry, increasingly driven by millennial tastes. "After that, we will fly."

CVOs are a rare species, not only at forums like the symposium, but also in the professional world. Kim says that is too bad. "'CEO' or 'President' are very boring titles. They come from the old school and are very authoritarian; top-down, very passé, gone," Kim says.

A rare job title

Einar Stefferud, an American computer entrepreneur, is thought to have become the first CVO in 1994. Almost 25 years later, the term's usage is still confined to certain sectors and countries. A search on LinkedIn shows most CVOs work in the IT industry, followed by marketing and professional coaching. The United States is clearly the epicentre of the CVO trend. Canada and India lag far behind.

Is it a meaningful addition to the company's governance or just a hollow title? "It can be both," says Omid Aschari, professor of strategic management at the University of St. Gallen. "Vision is one of the key components of an executive, but if it is compartmentalised into a job, it can be difficult to disseminate to the rest of the top management."

So can a singular vision be ... blinding? "Vision has the function of aligning an organisation, but one needs to make sure the diversity of opinions is not ignored," Aschari says.

Kim describes herself as a good listener. She's an advocate of "horizontal leadership," the latest buzzword for a non-hierarchical management style. "Being a leader is not day-to-day policing of what employees are doing. You have to tap into young people and the different departments. You need to be a sponge." ◆

Kim Sung-Joo

FAMILY VALUES – Family enterprises are the most common form of business entity in the world. But new business models and modern technology are challenging the status quo.

STEFANIE DIEMAND (TEXT)
LUKAS RAPP (PHOTO)
KATIE CHAPPELL (ILLUSTRATION)

GENERATIONS OF INNOVATION

You might think that a country can only have one royal family. In most cases that's true, but that is not the case in Sweden. The Nordic nation's unofficial ruler arrives in St. Gallen wearing a black suit and green tie, carrying a small black backpack.

Marcus Wallenberg represents the fifth generation of one of the most powerful families in Sweden: The Wallenbergs. Their businesses have dominated the Swedish economy for over 160 years. According to the Financial Times, in 2015 the Wallenberg family controlled businesses worth around 250 billion Euro. However, Wallenberg does not like the word empire. "Call it the Wallenberg Group or whatever," Wallenberg says.

Instead of being royally reserved, Marcus Wallenberg is a man who quickly comes to the point when talking about family businesses: "As a company you have to make sure that you do not stop changing, evolving and thinking new," he says.

The family business started in 1856, when André Wallenberg founded Stockholm's Enskilda Bank. Through a network of corporations and foundations, the family owns interests in companies like ABB Group, SAAB Group and Ericsson. When asked about the business values that the family's companies share, he often points out their long-term perspective and their ability to build businesses over a long time – attributes experts often cite as key traits of family-owned businesses.

Marcus Wallenberg

The Wallenberg's network of companies are an extreme example of a family business, but they're far from alone. According to KPMG Enterprise, there are over 14 million family businesses in Europe, which provide more than 60 million private sector jobs in total.

The importance of values

Even though most family businesses are not as big as Wallenberg's, most of them also rely on strong corporate values that are deeply embedded into their business strategies. Those values help shape the culture in both the controlling families and among their employees. Wallenberg says change also includes reflecting on which values are important to keep.

But things are shifting for family companies, and so are business values: The Internet has created brand-new business models, and automation and AI are rewriting the way employees work.

Research shows there are certain characteristics in family businesses that can work against innovation. A study by consultants from PwC Global asked more than 2,800 senior executives from family firms across 50 countries about the advantages and disadvantages of their companies. When asked about innovation and risk-taking, a third of the respondents said that family firms are less open to new thinking and ideas than other companies. Over 60 percent think that family firms are unwilling to take more risks than other companies.

Smaller giants

Wallenberg does not believe that family businesses are less innovative than start-ups. Still, he believes that the traditional companies have to change. "If you want to bring the best product and most innovative product at the best possible terms of condition to your customer, you have to change," he says. He believes that Chinese and US companies are better at innovation, particularly when it comes to technology and digitisation. "In the future, we have to compete with them." Therefore, traditional companies must keep their entrepreneurial spirit and understand how new technologies work.

But can the Wallenbergs be compared to a much smaller family business? Compared to the Wallenbergs, Martel AG St. Gallen might be considered a small family company – even though Martel is one of the leading wine dealers in Switzerland. The family owns two shops in Saint Gallen and one in Zurich.

At first glance, Jan Martel's family firm has only two things in common with the Swedish family's empire: Both companies were established in the 19th century. And both men represent the fifth generation to run the family business.

As far as Martel is concerned, there are two different camps when it comes to business models: Traditional companies and start-ups. "A functional family firm has to include both sides of the story," he says.

Just like the Wallenbergs, Martel does not believe that family firms will lack innovative spirit in the future. He says that oft-criticised decision-making procedures in family firms can be faster than those of start-ups. "We do not have to discuss things with investors, we can be fast and still express our values." That also includes adjusting their family values day by day.

Neither Wallenberg nor Martel see a lack of willingness to change on the part of family firms. "There are examples of family businesses that have been around for a long time," says the Swedish banker. "Probably they were pretty good at innovating and changing, otherwise they would not be in business anymore." ◆


RETRAIN the HUMAN
EQUAL PAY OR WE WALK AWAY
EQUALITY FOR ROBOTS
POLITICS

UNITED AGAINST THE ROBOTS

SPIRIT OF '68 – Automation is expected to eliminate millions of jobs. Philip Jennings, leader of the UNI Global Union, is working to recover trade unions' lost ground.

CHRISTINE HAAS &
JON MARTÍN-CULLELL (TEXT)
LUKAS RAPP & TOBIAS SCHREINER (PHOTO)
KATIE CHAPPELL (ILLUSTRATION)

Some call him the global warrior for workers' rights. And indeed, Philip J. Jennings gets emotional when talking about the well-being of workers. "I call on the students to take up the spirit of 1968!" he said during a debate with a representative of employer groups on the St. Gallen Symposium's main stage. "There is a revolution in the world of work, and this generation should push for people to be put in its centre."

This revolutionary roar would be familiar to the founders of the International Students' Committee, which established the symposium as a reaction to the left-wing, student-led protest movements that swept Europe in 1968. Jennings has led the UNI Global Union, an organisation representing 900 unions, since its creation in 2001. He is the face of a trade union movement looking to recover lost ground, at a time when robots are poised to take over millions of jobs.

The numbers are daunting. According to the OECD, 14% of jobs in developed countries are at risk of being automated, and a further 32% are likely to go through significant changes. The trade union movement is not new to such levels of disruption: They originated during the first industrial revolution at the end of the 18th century. Can today's technological change bring unions back to life?

On the ground, the reality is quite grim. In many European countries, the number of union members is decreasing. According to data from the European Social Survey covering the period from 2002 to 2014, union membership in Germany went from 19% to 15%. In Denmark, a country with traditionally high trade union coverage, it fell from from 77% to 69%. Jennings blames the declining membership on the "fluidity" of the labour market and shorter job tenures.

> *"Unions should be much more innovative and aggressive in trying to attract young people."*

One answer to this fall in support, he says, is to rethink outreach. "Unions should be much more innovative and aggressive in trying to attract young people," Jennings says. "We should go out into schools and places of higher education."

Jennings draws inspiration from the biggest German union, IG Metall, which has opened offices in universities.

On the opposite side of the debate, Roberto Suárez Santos, acting Secretary General of the International Organisation of Employers, which represents 150 national employer organisations, thinks unions need to modernise: "Their way of working is very conservative." Indeed, the labour market has become much less homogenous than it used to be. Automation has done away with the typical nine-to-five office routine. Alternative forms of work, such as freelancing, are on the rise. In the US, for instance, 36% of the workforce is freelance, according to 2017 data from the Freelancers Union. The instability inherent to such jobs complicates the negotiation of collective agreements. Jennings, however, seems optimistic. "Freelancers and unions belong together," he says. "It is a relationship that works." ↦

As an example, Jennings cites a sector-wide framework negotiated for workers of the film industry in the US. "There are a number of people saying that we are not going to fix this enterprise by enterprise. We really do need to have a more sectoral approach to establishing labour standards in the sector."

A response to automation

There is one issue on which both employers and trade unions seem to agree: The need to retrain workers. "We have to anticipate the upcoming scenario and develop new skills," says Suárez Santos.

In that regard, Jennings demands more concrete action. "We have a lot of conversation about how everyone needs to adapt and get new skills," Jennings says. "This requires investment in human capital, otherwise where will people go?" he asks.

Besides, Jennings argues, there are neither enough policies helping workers to retrain, nor are existing programmes sufficiently funded. "Adult education is a massive growth area both for public institutions and the private sector. This requires a new degree of financing."

Two hundred years ago in England, where unions were still illegal, workers took a radical road in response to the introduction of machinery. The so-called Luddites burned and destroyed factories and mills across the country. Rather than destroying machines, workers' dissatisfaction with the status quo is being felt at the polls: Brexit and the election of Donald Trump as President of the United States are widely seen as expressions of this discontent. "It is not just the transformation of work, but the insecurity people feel, and the sense that no one is looking out for them," Jennings says.

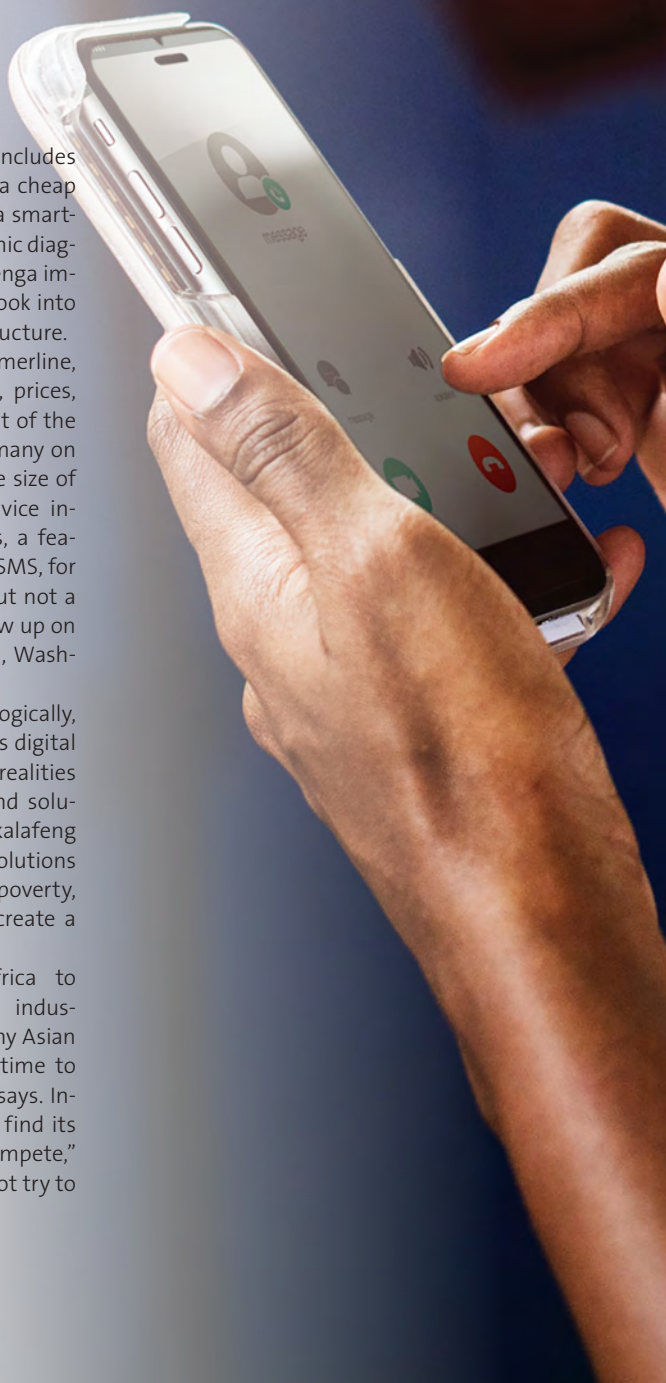
During the debate in St. Gallen, the audience was asked if they thought employers were doing enough to protect their employees from the negative consequences of automation. Two-thirds said no. Jennings takes hope from this result: "I think we are winning the argument that we cannot leave people behind, he says. Businesses and unions should work together." ◆

Philip J. Jennings

AFRICAN PROMISES

AFRICA – Technology has the potential to expand Africa's middle class. Thebe Ikalafeng says the continent must find its own way to prosperity – a move that's already under way.

SEBASTIAN BEUG (TEXT)



The discussion about automation, digitisation, and their implications is completely different in Africa. "For us, technology is not about automation, but about how to make it easier for us to solve our major problems," says Thebe Ikalafeng, a marketing expert and consultant. African policymakers are focused on more pressing problems, like poverty, reduced access to markets and market information, and financial services. In many countries, a new generation of African entrepreneurs has started tackling these issues using approaches specifically tailored to African realities and cultures.

The mobile payment service M-Pesa launched in 2007 by Safaricom, Kenya's largest mobile-network operator. Originally, it was developed for microfinance loans. For in-bank transactions and withdrawals, M-Pesa relies on a Safaricom agents network. One study found that in rural Kenyan households that adopted M-Pesa, incomes increased by five to 30 percent. "More than 50 percent of the Kenyan economy goes through M-Pesa. This shows you how technology in Africa is an enabler," Ikalafeng says. Prior to M-Pesa, 5% of Kenyan adults had a bank account. Now 77% do.

Or take WinSenga, an app and a toolkit developed by three Ugandan students aimed at lowering maternal and child mortality rates after birth. Rather than installing an ultrasound machine in hospitals with uncertain power supplies, WinSenga provides a toolkit for nurses and healthcare workers which includes a horn-shaped stethoscope with a cheap microphone that is plugged into a smartphone. In a country where ultrasonic diagnosis is lacking in hospitals, WinSenga improved healthcare in a way that took into account local context and infrastructure.

Another example is Ghana's Farmerline, which helps farmers track crops, prices, and markets. In Ghana, 42 percent of the population works in agriculture, many on small scale farms with an average size of 1.2 hectares. The Farmerline service includes advice via voice messages, a feature to reach illiterate farmers, or SMS, for farmers who have a cell phone but not a smartphone. Its founder, who grew up on a farm, now runs offices in Accra, Washington, and Zurich.

Though relatively simple technologically, M-Pesa and Farmerline show ways digital devices can be adapted to African realities to great effect. "Africa should find solutions that match African needs," Ikalafeng says. "Every country must create solutions which bring their people out of poverty, which create opportunities and create a better life for their people."

Ikalafeng does not want Africa to industrialise via labour-intensive industries such as textiles, the way many Asian countries have. "We don't have time to go that old, expensive route," he says. Instead, he wants the continent to find its own path. "Of course Africa can compete," Ikalafeng says. "But they should not try to match Europe or America." ◆

What would you do if you didn't have to go to work everyday?

CATHRINE BRAY & LAURIANNE CROTEAU (TEXT)
KARINE BRAVO (PHOTO)

Ryan Hreljac, Canada

"If I didn't have to work anymore, I would volunteer."

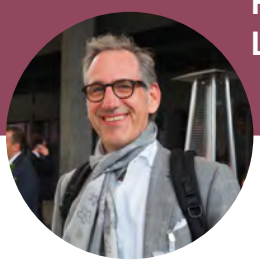
Franz Amesberger, Austria

"I would have a lot to do with my company, and also with my family, my friends, and everyone around me."

Seow Bei Yi, Singapore

"It would allow me to do investigative journalism, and take a few months for one story, instead of covering the news daily."

Hans-Jürgen Schmitz, Luxembourg



"I would build cars. I love restoring cars."

Surbhi Dwivedi, India

"I would travel more to discover new cultures and study behavioural psychology to understand them on a deeper level."

Guy Standing, England

"For me, work is what we do, not for ourselves, but what we do for our loved ones. Leisure and creative works blend in together."

STANDING UP FOR WELFARE

BASIC INCOME – Around the globe, automation is a concern for policy makers, who see a rising need for welfare as jobs disappear. But potential solutions are often derided as socialist utopianism.

SEBASTIAN BEUG, KIZZY BRAY & LAURIANNE CROTEAU (TEXT)
TOBIAS SCHREINER (PHOTO)

Automation and digitisation will threaten the livelihoods of billions of employees. Yet another consequence is less widely discussed: In the Western world at least, automation may mean the end of the welfare state as we know it. Policymakers around the globe are trying to shape its future, whether with a universal basic income, more vocational education, or technological progress.

Many Americans and Europeans fear that digitisation will cause turmoil in labour markets as globalisation did two decades ago. Though technology-driven mass unemployment may seem unrealistic today, economists observe an increasing polarisation between well-paid, highly-skilled positions and low-paid, precarious occupations.

In most Western nations, taxation systems to finance welfare transfers rely on labour, despite capital-intense production becoming increasingly important. Usually, profits from capital gains are taxed at lower rates than wages.

With automation on the rise, the gap between rich and poor could widen: "More and more income is going to those who have property: physical, financial or intellectual. Less and less income is available for people relying on labour, who already are facing declining real wages," says Guy Standing, an economist at the University of London.

European utopia

Potential answers for the challenges to come include different tax regimes, which rely more on the gains from capital, sovereign wealth funds to redistribute the gains from automation, or – the best known scheme – a universal basic income (UBI), Standing's personal favourite.

Standing co-founded the Basic Income Earth Network (BIEN), an association of academics and activists promoting UBI. "Everybody in society deserves to have basic security and conditions where they are sharing a dividend from the collected wealth of past generations, and the resources that belong to all of us," Standing argues.

Romanticised for a long time as socialist utopianism, UBI is now becoming a mainstream idea. Policymakers in Finland ran a two-year experiment in which 2,000 people received a UBI transfer instead of unemployment benefits. Switzerland's voters rejected the introduction of a UBI in 2016, although 23% of voters backed the concept. Business leaders including Tesla's Elon Musk and Siemens' CEO Joe Kaeser have become advocates for the concept, too.

Standing cherishes the idea's growing popularity. An older generation of Social Democrats tend to still oppose it, he says. "I think it is because they want a paternal state. I do not believe in paternalism," Standing says. "I believe in freedom."

On the other hand, Standing considers entrepreneurs advocating for UBI applause from the wrong quarter. "I worry because I do not want to dismantle the social state," he says. "We need services, social care, health care – they shape our society."

Despite its growing recognition, UBI and Standing still face many questions. It remains unclear how it would be financed, and whether every citizen should get the same sum or if a UBI might be based on profession, wealth, age, or citizenship. Potentially, the UBI could be realised as a negative income tax: The transfer would depend on a citizen's level of income, but lose its universal character. ↦

"A universal system says: We are all part of a community, we all need basic security," Standing says. Taking care of basic needs would, however, have labour market implications as well. In several experiments in the US, economists found that cash transfers reduce work effort, at least modestly.

American opportunities

The negative effect on work effort is the main reason why Philippa Malmgren, a robotics entrepreneur and former policy advisor to the White House, opposes the UBI. "We should not pay people not to work," she says. Malmgren does not believe in the end of work. "We see record numbers in employment everywhere from the US to China."

Wealth redistribution, whether via UBI or a negative income tax, does not work for her. "We need more growth in the economy which creates more tax revenue and adds jobs," she says. "Redistribution by itself is not the answer." To promote growth, she advises policy makers in the West to place more emphasis on small- and medium-sized enterprises, through tax cuts, for example. US data shows that firms with less than 500 employees account for 47.8% of US private-sector employment and 41% of total payroll.

Malmgren argues that university graduates will not be the only ones with jobs in the future. When she tried to hire PhDs for her robotics company, she found they were only able to fly a drone on a computer screen. Building, welding and assembling a physical drone requires employees with vocational training. Now, Malmgren hires people with experience building toy planes or toy railroad trains. "You do not need artificial intelligence skills to do this."

Toy trains and drones may be nerdy examples, but there are other blue-collar jobs that are critical for the economy: Garment workers will always be needed, Malmgren claims. "A large problem is we have assumed everybody is going to college and getting a white-collar job," she says. "But there are many jobs that require more vocational skills. In fact, we have labour shortages in these areas."

To prepare the welfare state as we know it in Western countries for automation, Malmgren also suggests adjustments. Currently, US insurance and pension funds stick with one company. In the EU, they are non-transferable between member states. "The system would work much better if people could take their insurance with them or could work for five employers part-time," she says.

AI could actually make welfare systems more efficient. "AI could make government expenditure much more transparent, if not crystal-clear," Malmgren says. "That will put an end to a lot of unnecessary government spending."

The downside of governance through AI, however, can be observed in China. With the recently introduced Chinese Social Credit System, every person is awarded a score on social compliance. Looking at pornography or parking illegally lowers scores, and prevents people from obtaining certain permits. It is easy to imagine welfare transfers depending on social compliance. "We have to be very careful about such systems," Malmgren says. "They could become authoritarian systems in conflict with democracy." Luckily, China is not the model for Western welfare schemes right now.

After all, short-term labour market and social security reforms in reaction to automation may be modest. If automation causes mass unemployment one day, it may push policy makers to establish a universal basic income – and bid farewell to the welfare state as we know it. ◆

Philippa Malmgren

FUTURE FACTOR: POLITICS

RANA KHALED (TEXT)
TOBIAS SCHREINER (PHOTO)

Heather Evans

In her role as a senior advisor at the Canadian Ministry of Economic Development and Growth's Disruptive Technologies Unit, Heather Evans spends a lot of time telling businesses in the Ontario area how to adapt to new technologies in order to stay competitive. She expects machine learning will augment and improve the work that she does for the civil service. "The world we are living in today is improving incredibly fast, and the way we work as policymakers and civil servants cannot keep pace unless we integrate the new tools," she says.

That is not to say she doesn't have concerns. Automated decision making, for example, could lead to a crisis in democratic governance, which is why laws to address the issue are a pressing concern.

Jack Chambers

Irish politician Jack Chambers works as a representative of the people of Dublin West in Dáil Éireann, the lower chamber of the parliament. He's also a spokesperson for Ireland's Republican Party, Fianna Fáil, on defence issues. The 28-year-old politician is closely following his government's efforts to embrace new technologies. "Humans may be irreplaceable, but technology represents a huge challenge not only for Ireland as a country, but also for Europe and the globe," Chambers says. "Inevitably, AI will replace some jobs, but I do not think it will have the predicted effect of diminishing the human labour force." In his opinion, it is the responsibility of governments to give people the opportunity to move forward, perhaps in the form of training programmes and skills courses.

Surbhi Dwivedi

The National Students' Union of India is an association that was founded in 1971 to "empower the student community to create responsible citizens and leaders" – and Surbhi Dwivedi is one of its general secretaries. Her particular interest is social activism for defending gender equality and democracy, something she sees as threatened by the influence of new technology – particularly the power of social media to negatively impact democracy. "I am worried about the false propaganda that spreads on social media networks, especially when people do not have the tools for verifying data," Dwivedi says. "Integrating AI in politics poses a big concern because politics is based on trust, and now political campaigns are mostly marketing-based."

FADING FORTUNES – Could Social Democrats revive their fortunes by offering solutions to turmoil caused by the third industrial revolution? German Social Democrat Sigmar Gabriel claims that automation should benefit employees, not just employers, and offers a concrete plan for an employment fund.

SEBASTIAN BEUG (TEXT)
LUKAS RAPP (PHOTO)

"IT IS ABOUT BRINGING ADDED VALUE TO SOCIAL SECURITY."

Social Democratic Parties across Europe are in decline. For instance, consider the recent electoral results in Italy, Germany, and France. Does this worry you?
Of course. I was chairman of the Social Democratic Party in Germany. We have to admit that the conditions under which Social Democrats succeeded in the second half of the 20th century are almost gone. There used to be a strong faith in collective representation. Today, people are more individualistic. Fundamental changes in our societies make it harder for Social Democrats. Obviously, we failed to adapt to these new conditions.

Many Social Democratic Parties are considered part of the political establishment. Meanwhile parties positioning themselves as anti-establishment are gaining momentum. Do they have better answers to the problems posed by automation?
Definitely not. Those who plead for [economic] isolation, plead for a programme to create mass unemployment. Germany is a country that depends on exports like almost no other. We produce more cars and more windmills than we need. Of our exports, 60 percent go to the rest of Europe. The "Germany is a payer country that bears the burdens of Europe" narrative is plain nonsense.

The German government of Christian and Social Democrats aims at full employment. However, in other European countries, particularly in southern Europe, youth unemployment is high. How can Europe get on the same track?
Unlike other countries, Germany has dual vocational education and training. A large proportion of young people are trained on the job. This way it is easier to enter the labour market after education and training than if they only learned in a classroom. This is the reason why the German model is so successful. However, it is hard to transfer. It is essential that employers accept vocational education and training as their responsibility. They do so in Germany because it is in their own interest. At the end of the day, we must invest extensively in research and development, also in southern Europe, and less in consumption. For too long, this was done wrong in Italy and Greece.

You say you are a Social Democrat and do not believe in the end of work. Why?
Until now, history has shown us differently. I can imagine that, if not politically guided, work will be distributed unevenly. There will be people who are well-paid and work a lot, and people who work very little and do not get much for what they do.

That seems like a bleak outlook. What can Social Democratic parties or politicians do to change the future?
We want to make sure that this inequality does not develop. So far, we have understood labour market flexibility in a way that meant employees had to adapt to their employers' needs. Automation offers a chance to do this in favour of the employee. I compare it to the unions' campaign for the five-day week in 1963. It was not about getting a day off work. The unions' posters advertised it with a boy saying: "Daddy is mine on Saturdays." Working and living should go more hand in hand. To shape this is a genuine task of social democracy.

What answers do Social Democrats have for the increasing gap between well-paid jobs for highly-qualified workers, and more precarious employment?
There is not a single answer. It is very important to create a new form of social security to which people entrust their own future and that of their children. This includes the question of how we deal with the future of work in a digital world? Jobs requiring middle and higher qualifications will be endangered too, including insurance brokers, bank clerks, designers or engineers.

Sigmar Gabriel

Sigmar Gabriel, 58, was Vice Chancellor of the Federal Republic of Germany from 2013 to 2018 and previously served as Minister of Foreign Affairs, Minister of Economic Affairs and Minister of Energy. He served as chairman of the Social Democratic Party (SPD) of Germany from 2009 to 2017, and promoted centrist, socially liberal, and pro-business positions. He started his career in state politics in the federal state of Lower Saxony, where he still holds a district as a member of the German Bundestag. At the 48th St. Gallen Symposium, Gabriel delivered a speech entitled "Challenges for Europe in the new international constellation – perspectives for work, innovation and economic prosperity."

What do you tell a bank clerk who won't be needed in five to ten years?
I cannot comment on every single job. I know that there will be better-qualified jobs left, and I know that the human-oriented service sector – jobs like teachers and nurses – will actually increase in size. For mid-level jobs, it may mean talking about a shift in qualifications.

You have proposed an employment fund. Is that a model that could be a solution for other countries, not only for Germany?
Yes. The idea is that every employee, trainee, or student gets some sort of financial contribution. They can use the money for the time they upgrade their skills or the time they are unemployed. The question is, how can it be financed? It could be a way to bring the added value from automation to the social security system. Why should Amazon, Google, or Facebook not contribute to the stability of our society? ◆

WARBOTS – Whether seen as a way to save human lives or as a great threat, there is no doubt that AI will bring deep changes to the battlefield.

CECILIA ARREGUI (TEXT)
KATIE CHAPPELL (ILLUSTRATION)

WEAPONS OF AUTOMATED DESTRUCTION

In April 2018, the Robotic Complex Breach Concept demonstration was conducted by troops from the United States and the United Kingdom at a base in southern Germany. Autonomous weapons were deployed to perform a variety of tasks, including a remote-controlled breaching of a mock-up enemy position. "U.S. military replaces soldiers with robots in first-of-its-kind training exercise," read an April 2018 Newsweek headline.

The episode made clear that artificial intelligence and robotics are already widespread in the warfare industry, and that their applications will continue to grow. Dileep George, co-founder of Vicarious, and Marek Rosa, CEO and CTO of Good AI, both manage companies that aim to develop human-level AI. In the midst of an increasing technological arms race, the two entrepreneurs give their perspective on what the future of war will look like, and whether the unavoidable transformations in the job of soldiers will be for better or for worse.

Machines making decisions?

Any technology has both positive and negative effects. As a society, "we figure out the best ways to apply it," George says. However, the Indian researcher has his doubts when it comes to lethal autonomous weapons: "I do not think it is an idea that we should rush into without a lot of thinking," he says.

He is not alone. In 2017, 116 leaders in tech companies from 26 different countries signed an open letter pressing the United Nations to ban the use of "killer robots" in warfare. Marek Rosa was among them. Nonetheless, he knows it is a trend that cannot be stopped because of the so-called security dilemma: States are scared that if they do not build such technology fast, somebody else will. Still, the Slovak entrepreneur insists, good uses of AI can "save soldiers' lives by not putting them in physical danger in the first place."

Soldiers of the future

George and Rosa agree that the work of soldiers as we know it is about to come to an end. Military technology is already enhancing human capacities, and shortly warfighters will be able to make split-second decisions with the help of artificial intelligence and augmented reality toolkits. "The individual will still make the decisions, but will be provided with researched information that will help them be more accurate," George explains.

A widespread argument against automated weapons goes like this: By saving lives on one side of the conflict, you are probably killing more people behind enemy lines. George believes this reasoning is counterintuitive. "War has always been about the advantage of one side over the other," he responds. In fact, AI can reduce the number of casualties by coldly analysing the battlefield, without worrying about self-preservation "If the emotional decision factor on the field is removed, maybe things become safer," argues George.

And while Rosa agrees that weaponised robots with the capacity to determine when to shoot are not a good idea, "even people are not that good at deciding who to kill." For him, it is important to distinguish between using artificial intelligence to attack, killing as many people as possible, and using it to limit casualties both on the civilian and enemy sides. "AI can also help soldiers do the latter, and then it would actually be good for everyone," he says.

Most of these technologies already exist. However, their developers still cannot guarantee predictability and zero-failure functionality, and there is still a way to go before they can extensively be used in the battlefield.

The good guys' responsibility

Could AI still be used the wrong way in warfare? Undoubtedly, as the technology becomes cheaper and more accessible, it can end up in the wrong hands. AI can also be hacked and reprogrammed. Terrorism or other threats might even grow. "Once we let it out, it may be hard to control," says George.

As AI experts and entrepreneurs, George and Rosa feel a certain responsibility to reduce the risk that technology might

bring. Good AI even started a challenge for its workers offering prizes for those who submit proposals on how to avoid a race. And, of course, they both work to raise awareness, by participating in the St. Gallen Symposium and other events. One burning question is how open researchers in the field should be about their discoveries. According to Rosa, cooperation is always more beneficial than competition, and that is a way to reduce conflict and risks.

On the other hand, a report titled "The Malicious Side of Artificial Intelligence" was released in February 2018 by multiple respected researchers from the US and the UK. With the aim of prevention and mitigation, the document suggested, among many other things, not spreading research broadly until the associated risks have been assessed. It's an approach that gives George pause: "Not putting ideas out there is going to kill innovation rather than control the bad guys."

Far from now

As weapons become faster and more effective, Rosa imagines a future without human soldiers. War itself will be reimagined, he says: Instead of machines killing people or other machines, confrontations will be more about information, because it is a much more efficient way to fight.

That's the optimistic view. For a pessimist, the full mechanisation of war is a grim prospect. For example, without soldiers there might be fewer worries about military action. "When a person is included in the loop, the empathy that they will have for other human beings becomes part of the equation of controlling any conflict," George says. "Removing that empathy from the conflict is a disastrous decision." ◆


SCIENCE
←New York
Hyperloop
Los Angeles→

HYPERLOOP – Dirk Ahlborn, CEO of Hyperloop, shines a light on the power of innovative business structures fit for the Internet age.

SAMUEL LINDBLAD (TEXT)
TOBIAS SCHREINER (PHOTO)

"WE ARE TRYING TO MAKE AN 'IDEACRACY.'"

Dirk Ahlborn is a German-born entrepreneur who found success in crowdfunding projects. Ahlborn, along with a large team of workers spread across the globe, is now working to make Hyperloop travel a reality. The innovative system promises to transform transportation by reducing the cost of travel to almost nothing, decrease travel times tenfold and run on nothing but renewable energy. Both Ahlborn's past ventures and his leadership of Hyperloop have utilised unique and innovative business structures which Ahlborn claims are ideal for the Internet age. We sat down with Ahlborn and chatted about how Hyperloop's business model has fascinated business schools across the world.

What do you believe to be the most interesting part of Hyperloop's business structure?
Building the Hyperloop business model taught us a lot about communication. It used to be all about putting as many engineers as possible onto one problem, but we quickly realised that smaller teams are way more efficient. A team of more than eight people tends not to communicate as well as one with fewer members. Rather than having larger teams, we pose the same problem to different groups and see if they come up with different solutions.

How did you begin building the model?
We used a completely new model. I was part of a non-profit incubator funded by NASA that aimed to help entrepreneurs build a better company. Today, we do everything online – you do your grocery shopping, your dry cleaning, and you can find a partner online. When it comes to building a business, it tends to be you and a friend in a closed space trying to fix a problem that, after six or seven months, you realise nobody else cares about. If you could find, say, one hundred people who are as passionate as yourself and are willing to really offer their criticisms, insight, and contacts, you would be able to build a better company. When Elon Musk said he was too busy with Tesla, we used an online platform to source engineers who would be interested in the project and then offered to pick it up. We then asked those we found on the platform if they would like to work in exchange for stock options. If they agreed, we asked them to apply. They would only have to work a minimum of ten hours per week. After that, we continued to expand and went from a team of around one hundred engineers to the team of eight hundred that we have today.

What is the role of management in your business model?
Today, the company has around 800 employees across the world, in addition to fifty other companies and a large wider community that we consult with. Harvard did a case study about us and started teaching the case last year. The model changes the fundamental way we manage. Workers invest their time and spend less time with their families in exchange for engaging work that they know will pay off in the future. Our job as managers becomes ensuring that these people feel that their work is meaningful.

Is the hierarchical business structure a bad fit for the Internet age?
Some vertical organisation is still necessary, but there must be the possibility to connect the top with the bottom. Without that, the company becomes subject to the same limits that sees communication wither in larger teams. We are trying to make the company an "ideacracy" – based on who has the best idea, rather than who has the best title.

Do you think that these horizontal management structures can be applied to companies outside of the tech sector?
Yes – though it is easier with a fresh company. It takes a lot of commitment and a lot of effort. We do our hiring based on the individual qualities of the person and ensure that they are self-motivated and driven. I always say that if you are working with great people then there is no issue. Management problems come in when you are working with mediocre people who are less motivated. In the end, many people work in a distributed way – though that style of working is not for everybody. Transforming an existing business structure into ↦

a distributed model is difficult, and management may not be incentivised to make the switch. In addition, if things are going well for a company they are unlikely to change. A big problem in Europe right now is that the CEOs of the big companies are paid for today's results, not the results that are coming in ten years' time. Car companies, as an example, are doing well right now – but they are resistant to change and are, in effect, not futureproofing their business. A solution to this is for big companies to create independent subsidiaries that utilise new business structures.

Do you see it as a problem that managers at many private sector companies are paid exponentially more than their lower-level employees?
The issue is that you want to attract the best people. Unfortunately, that is the reality, and it is reiterated throughout other levels of management. Less-skilled labour that is easily trained and easily replaceable is a cost factor that must be considered, though having a middle ground that sees all workers participate in the company profits is a good solution to this. In our case, everybody is a shareholder. I think it is important to be transparent about why management earns what it earns, and to ensure that everybody in the company does well when the company succeeds.

So is class a barrier when it comes to becoming the kind of knowledge worker sought by these new business models?
We have people in India doing ten hours per week and people in the US doing the same work for the same pay. All it takes, in essence, is a computer and an Internet connection. This makes the barrier very low. At Hyperloop, the way we work is, a lot of the time, without direct payment – you, together with everybody else, create the value of the company and prosper with it. It is less of a payment and more of an opportunity. Ten hours per week seems a sweet spot that anybody can manage to do. Two hours over five days is less time than many people spend in the gym. Of course, if you have a very busy life with a new child or something similar, then you may be unable to commit to the time but, mostly, you could take on the work. The only real barrier is motivation.

What motivates Hyperloop employees?
All of the people at Hyperloop are trying to fix transportation. They have a reason for doing their work, and it is not to become rich. We see this in the company a lot – those who are seeking only the financial benefits tend not to last long. It is about having an opportunity to build a transportation system the way it should be done. ◆

Dirk Ahlborn

German-born Dirk Ahlborn is an entrepreneur with 15 years of executive experience in Europe and North America. Ahlborn lived his early years in Berlin and most of his adult life in Milan. Initially trained to work in banking, Ahlborn moved to Los Angeles in 2009. Ahlborn now runs Hyperloop Transportation Technologies, which hopes to build a high-speed tube train that transports its passengers at a maximum speed of 1,223 km/h, potentially reducing the travel time from San Francisco to Los Angeles to only 36 minutes. In addition to his position at HTT, Ahlborn also serves as CEO of Jump Starter, Inc., a crowd-sourcing and crowdfunding portal.

PLAYING FOR A LIVING

FUN & GAMES – The gamification of work is supposed to motivate and excite us. While this may sound appealing, some critics suggest that we should be cautious, particularly when it comes to the management and psychological issues that gamification poses.

KALENDRA WITHANAARACHCHI (TEXT)
KATIE CHAPPELL (ILLUSTRATION)

Good news, nine-to-fivers! Your working lives could soon get an exciting makeover due to the innovative rise of occupational gamification. By placing a focus on challenge and achievement, the gamification of work is a strategy designed to motivate employees to perform better on the job.

So how does it work? Let's take the example of Bluewolf, a global business consulting firm based in New York. Beginning in 2012, Bluewolf created a programme called #GoingSocial in order to incentivise employees and enhance their commitment to building the company.

Now called PRIME, the programme makes heavy use of gamification techniques: Bluewolf's employees get points for internal and external networking, for publishing a post on Bluewolf's blog, and for sharing content on LinkedIn and Twitter. These points and rewards – which range from T-shirts to lunch with the CEO – are then presented on an individual employee's "Pack Profile," which can be accessed on the programme.

All of this sounds like a blast, right? For employers, it's certainly got advantages. According to Alain Dehaze, CEO of the Adecco Group, the gamification of work has given recruiters a new way to educate and train workers. "Gamification is a tool to leverage the impact of education and training," says Dehaze. "You learn faster through a game."

Adecco is also incorporating gamification concepts into its recruiting efforts. It recently introduced a "CEO for one month" programme. Essentially a high-powered management trainee selection process and internship programme, the global challenge selects 47 finalists from a pool of over 200,000 applicants from around the world. The final 47 work alongside the company's country CEOs; the final ten candidates compete at a management "boot camp" for a spot shadowing Dehaze himself as global CEO for a month. (The finalist also earns a USD $10,000 "salary.")

The unconventional recruiting approach – which involves team-building exercises for candidates along with elimination rounds – is a way to set the Adecco Group's recruitment process apart using gamification techniques. It's an appropriate approach for an HR firm that wants to stand out.

A catalyst for learning

Dehaze's arguments ring true to Jamaican physicist Dominic Mills-Howell, a postdoctoral student at the International Centre for Theoretical Physics in Trieste, Italy and Leader of Tomorrow whose essay for the St. Gallen Wings of Excellence ↦

Award was entitled "Artificial Intelligence, Gamification, Culture and the Amistics of Human Development". "The main idea behind the gamification of work is to accelerate the learning process", says Mills-Howell.

Gamification, Mills-Howell says, can be very beneficial to the employee. For example, a video-game style leader board is a way to publicly recognise an employee's achievements. This therefore motivates people to always perform their best.

Re-defining work in a more creative sense

Dominic Geissler, M.A Candidate in Business Innovation and Design Thinking at the University of St. Gallen, is also optimistic about the gamification of work. This is because the phenomenon may allow us to re-define what work means.

"Nowadays, work means income-generating activities. In the future, work will be about pursuing your leisure activities. On the side, you'll get additional basic income," says Geissler. Gamification of work promises a double advantage in the sense that it might enable individuals to really have fun with their jobs – and also get paid for enjoying themselves.

On the other hand, gamifying a workplace is not a straightforward process. "To have long-term success, you have to really think about how specifically you use game mechanics in order to achieve goals," says Geissler. Game-design experts must create gamification techniques that are actually going to motivate the employee.

Geissler argues, for example, that just relying on a leader board is a problem: After an employee gets to the top, they may not be interested in gamification anymore. In contrast, an employee who is struggling to compete with their peers on the leader board may feel "disengaged" with the concept of gamification. Companies need to ensure that they are always coming up with something new and creative.

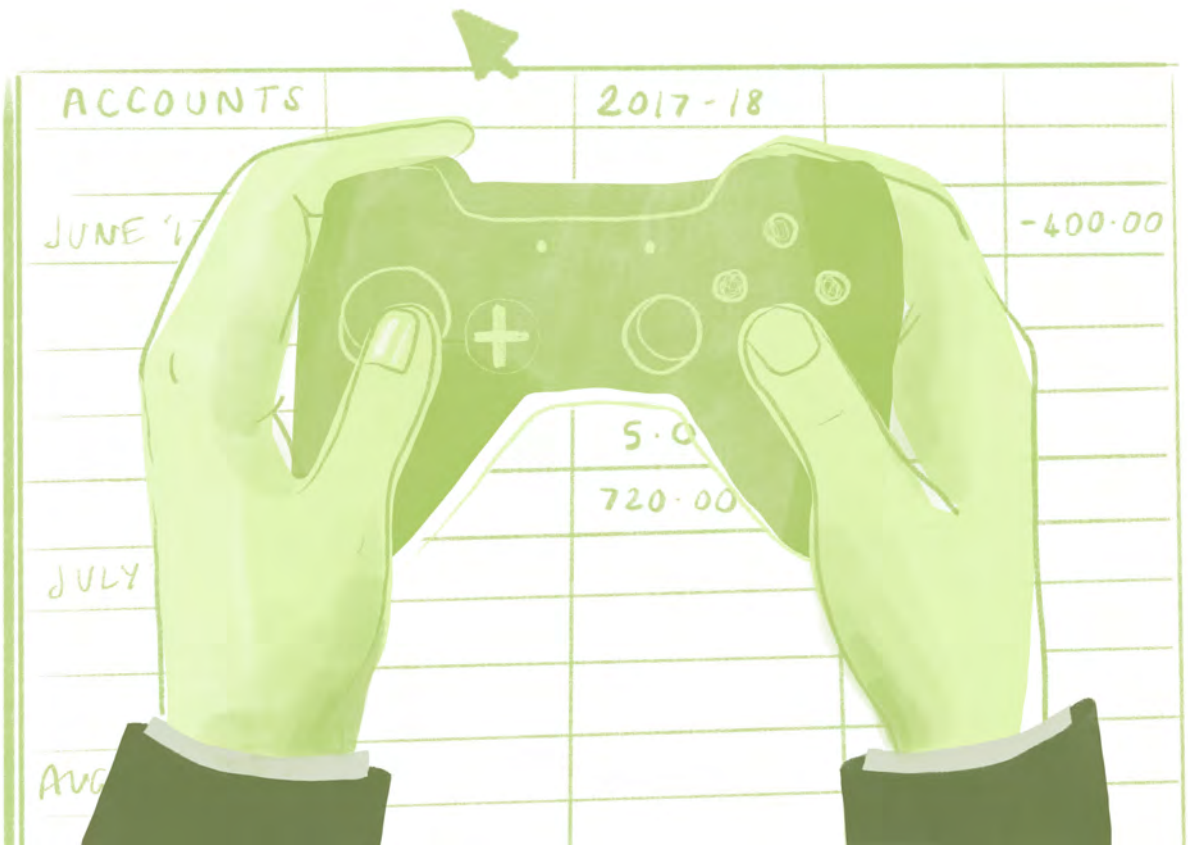
"You are kind of giving people a drug"

To Stefan Kießling, M.A. candidate in Philosophy and Business Administration at Copenhagen Business School, gamifying a workplace is comparable to giving employees a kind of drug. In other words, it sometimes verges on the immoral: The most powerful gamification techniques have the dangerous capacity to really get into an individual's mind. "Gamification can cause employees to become very competitive with one another and this can therefore lead to individuals feeling distressed," says Kießling.

Because of these factors, Kießling agrees with Geissler and argues that one must be very careful when designing the elements of a gamification platform.

So is gamification a blessing or a curse? For Bluewolf, the #GoingSocial programme was definitely a blessing: Ten months after its initial launch, its blog traffic tripled, and visits to its website from social media platforms rose 68 percent. The approach was so successful Bluewolf expanded and continued it. The programme is now known as PRIME; Bluewolf executives claim it's boosted staff retention, project volume and revenues.

And at Adecco? Applications for their innovative recruiting programme are up, and it has become an annual event. The future of work, it seems, may be fun. ◆



FUTURE FACTOR: SCIENCE

LAURIANNE CROTEAU (TEXT)
LUKAS RAPP & TOBIAS SCHREINER (PHOTO)

Michaela Musilova

Since she was a little girl, Michaela Musilova dreamt of going to space. "Astronauts are superheroes, and I wanted to be one as well," she says. Today, Musilova is an astrobiologist and aspiring Marsonaut – an astronaut who goes to Mars – working with NASA. From the existence of aliens to how life formed on Earth and what the future of humanity might be, she studies the most essential questions of life in the universe. She believes artificial intelligence is the key to future space missions. "AI could help build a colony on Mars by sending robots to collect soil and 3D printers to build bricks," she says. "It could then assemble houses so that the astronauts have homes ready for them to live in."

Akash Gupta

Mechanical engineer Akash Gupta is co-founder and CTO of GreyOrange, an automation start-up providing warehousing and logistics solutions. He recently designed an autonomous mobile robot capable of handling all the steps of warehousing, from handling goods to delivery. The robots understand their environment and can cooperate with each other. According to Gupta, the future of robotics means including robots in our everyday lives, as we do with our smartphones. "AI and robots will need to adapt to an environment built for humans - with sidewalks and stairs, for example. I imagine the robot of the future looking more and more like us."

Anna Beukenhorst

"I don't see robots replacing humans in healthcare anytime soon," says Anna Beukenhorst, a PhD student at Manchester University studying healthcare. She uses the data from everyday devices like smartphones, smartwatches and other wearables in her project "Cloudy with a Chance of Pain," an app investigating the relationship between the weather and symptoms associated with chronic pain. "Artificial intelligence helps us by processing a big amount of data, but expert knowledge is needed to actually make sense of it. The opaque black box system doesn't work in healthcare."

FAMILY TREE – From the manipulator arm to the potential ethical robot: A timeline of six main technological breakthroughs in the history of robotics, explained by inventor Ronald Arkin.

CECILIA ARREGUI (TEXT)
KATIE CHAPPELL (ILLUSTRATION)

ROBOTS OF YESTERDAY, TODAY, AND TOMORROW

1961 *1972* *2002*

The Unimate became the first mass produced industrial robotic arm in 1961. It basically consists of an automated piece of equipment that can make repetitive and highly accurate movements. "The factory was a whole lot easier [for early robots] because you can engineer the environment to the needs of the robot, rather than the machine trying to figure out the real world," Arkin explains.

Developed between 1966 and 1972 by SRI International, Shakey was the first robot to combine logical reasoning with physical action. It used formal logic provers to build models of the world and reason through them. According to Arkin, the system was a breakthrough for traditional AI at the time, though its innovations are not used much anymore.

Some of Arkin's early work included faster-reacting robots that were usually bio-inspired, modelled after insects or other small animals. They stopped relying on an internal concept of the world and shifted towards "using the world as its own best model," in roboticist Rodney Brooks' words. Such a paradigm paved the way for Roomba, the autonomous vacuum cleaner, released in 2002.

For at least six decades, advances in the vast field of robotics have been occurring at a dizzying pace. There is no doubt that these ever-evolving machines have already changed the world and will continue to do so. "We cannot exaggerate the potentials of the technology we are building," American roboticist and "robo-ethicist" Ronald Arkin says.

For non-experts, it is hard to distinguish real developments and their applications from science fiction creations and conspiracies. But Arkin does not think robots will ever replace humans. Instead, he argues, shaping tomorrow's robots is more about paying attention to how the know-how is moving forward and ensuring it delivers things humanity desires. Says Arkin: "The future is not to be feared, it just needs to be managed."

Arkin has been programming software for robots since the early 1980s. As the Director of the Mobile Robot Laboratory at the Georgia Institute of Technology College of Computing, he feels proud of all the machines he has created. In a way, they are like his own children.

In order to understand the past, present and possible future, Arkin explains the trajectory of robots in six basic chronological steps, classifying them according to the main technological breakthroughs that led to paradigm shifts in their use. ◆

2013 — *Tomorrow* — *In the future*

At the beginning of the twenty-first century, advances in probabilistic robotics enabled all sorts of new capabilities, such as map-building. This technology, for instance, helped make possible the development of driverless cars. If Arkin had to choose one robot to capture today's spirit, he says, it would be Atlas, by Boston Dynamics.

Human-robot interaction is a discipline that has been rapidly growing. From Arkin's perspective, the next big leap will be designing devices people trust. That will result in humans feeling more comfortable around the automated machines. It involves understanding how humans relate to such objects. According to Arkin, they could take any physical form.

Taking it one step further, and probably taking advanced humanoid shapes, these machines will behave in a way that fits "human socio-cultural norms." People will be treated with respect by the robots, who will also expect to be regarded that way. Says Arkin: "We should allow them to become part of our society, considering them partners and not slaves."

WHAT COMES AFTER THE CAR?

LONG ROAD – The automotive industry faces an unknown future. New technologies have already led to a demand for new skills from the automotive workforce. This threatens to leave many workers behind.

STEFANIE DIEMAND (TEXT)
TOBIAS SCHREINER (PHOTO)

Wilfried Porth arrived in St. Gallen by car. As a member of the Board of Management of Daimler AG, this might not be surprising, but he was far from alone: A large number of students, leaders and speakers did the same.

Even though motor vehicles are the most commonly used modes of transportation today, another future may lie ahead of us. If the most extreme predictions come true, only 20% of Americans will own a car in 15 years. Instead, carsharing systems and self-driving cars may be their first choice for getting around. The number of passenger vehicles on American roads is also expected to plummet, from 247 million in 2020 to 44 million in 2030.

Not only one vision

"Everyone is talking about carsharing, which is a fast-developing business model and getting more and more attractive," Porth says. The company is developing different ecosystems for urban mobility. Recently, Daimler AG and BMW Group announced that they want to combine their carsharing businesses to shape the future of mobility. The joint venture also includes ride-hailing, parking and electric-vehicle charging. "We cannot rule out any technology," he says. "To focus on only one technology would not be clever."

The Daimler executive points out that car companies' need to maintain a diversified portfolio of technologies means combustion engines have not yet reached the end of the road. "At the moment, technologies are declared dead that are not really dead at all," Porth says.

But, with China, the world's largest car market, looking to ditch gas and diesel cars in favor of cleaner vehicles in the future, there are signs that the internal combustion engine has a limited future. "The question is whether a modernised combustion engine, the fuel cell or a battery-charged electric vehicle can create the best overall ecological footprint in specific use cases. For example, you have to take into account where the energy for e-mobility comes from," Porth says. And that, says Porth, is not something that the customer has to worry about at the moment – a claim which many analysts, investors, and car buyers might disagree with.

There might be another group that has something to worry about. Carsharing systems and new engine technologies could leave many automotive industry workers without jobs. The automotive industry is an important factor for the worldwide labour market: Today around 13 million people in Europe and 7 million in the US work in the car industry.

Different skills will be required to produce the cars of the future, however. New machinery, automation and products like electric vehicles will demand new skills from the automotive workforce, while other skills will no longer be needed.

For example, while a gasoline or diesel engine consists of more than 1,000

parts, there are only around 200 parts in electric engines. A study carried out by the German Automobile Association and the Ifo Institute claims that with the end of combustion engines around 600,000 jobs in the auto industry would be threatened in Germany alone.

Retraining workers is one possible fix. "We have always prepared people for new challenges," says Porth, whose responsibility as a Daimler board member includes human resources. "It is true that the challenge we are facing seems bigger than those we have dealt with in the past, but change, innovation and evolution is nothing new for us. We have a 130 year history of managing change successfully."

Game-changing technology

Changes in the automotive industry do not only affect car manufacturers, they also have an effect on upstream industries such as steel, chemicals, or textiles, as well as on downstream industries including car repair and mobility services.

Wolf-Henning Scheider has been CEO of ZF Friedrichshafen AG – an industry giant with more than 146,000 employees – since February 2018. What could new technology mean for one of the biggest automotive suppliers in the world? "We have experienced some upheaval over the last few decades, says Scheider. "However, in the end we always came through with more employees."

Scheider says that the car of the future will look simpler. But this car will need different technologies, utilising "fewer mechanical and more electronic components."

Like Porth, Scheider believes that offering more employee training could solve qualification issues. "We already train our workers," says Scheider. "But I do not want to play down the fact that the need for some skills is decreasing, while the demand for others is on the rise."

But is this really enough? If the electric motor is built by only a few people, what happens to the surplus workers? Scheider says that some challenges are too big for companies to solve alone. As jobs come under threat by automation and shifting technology, cooperation with the government is important to manage this change on a macroeconomic level.

So is the car industry ready for the revolution? That depends on the kind of revolution we will face. Porth says their business model might change in the future, but it will not be totally different. "We will sell cars, but we will also sell mobility," he says. ◆

SOFT SKILLS – We have all been told creativity, high-level thinking, and empathy are all assets in the workplace that would be hard to get out of a robot. So how can we adapt our education systems to train for the future?

LAURIANNE CROTEAU (TEXT)
LUKAS RAPP & TOBIAS SCHREINER (PHOTO)

LEARNING FOR A POST-LABOUR AGE

> *"Artificial intelligence could help by developing and adjusting the curriculum of the kids, individually, every month, based on their performance."*

Lisa Mallory

Amidst all the talk of robots taking our jobs, the future of education is often assumed to be radically different – as though we will need entirely different skills, and hence an entirely different educational system. But experienced educators suggest the system we have may serve us well in the future, if only we can tweak it a bit. That means the real question is not why should we bother learning in the future, but how can we best prepare ourselves for the unpredictable decades to come?

Learning to learn

At the symposium, education experts agreed that the key change to the educational system of the future will be finding a way to make learning life-long. Vocational training is one way. Online courses are another. But a far more fundamental skill, one that is vital to begin teaching now, is knowing how to learn. "When shaping our educational system, we should not look for a particular outcome because the world will always be changing," says Justin Lee, founding partner of the Walden International School in Ontario, Canada. "Schools need to focus on creating life-long learners."

To cope with the challenges of the future, classes should get practical. "We should not just learn for our exams; we


Rajeeb Dey

> *"When shaping our education system, we should not to look for a particular outcome because the world will always be changing."*

need to be able to reflect on situations," says Rajeeb Dey, an Aspiring Leader who founded Learnerbly, a platform connecting employees to learning and development opportunities.

Putting students in real-life situations, where they have to resolve a problem, helps them not only learn from one another but also make links between their courses and real life. "Why do we stop wanting to learn certain subjects at some point?" Lee asks. "For me, it comes down to not understanding the purpose behind them and not grasping the concept."

Failing: the key to resilience

One of the hardest things for students and parents to cope with is failure. That, too, needs to change. With failure comes resilience, which will be especially needed in the age of automation. "A lot of learning comes from experience," says Dey. "You have to be willing to fail, to take a risk, and be comfortable with uncertainty."

Although this lesson can be taught at school, Dey believes it is a shared societal responsibility. Says Dey: "Parents should encourage their children to take risks and be uncomfortable, encourage teachers to take risks and fail, and prepare society to be more open to failure."

There is a darker side to failure, one that society may find hard to accept. "You have winners, but inevitably losers," says Leader of Tomorrow Lisa Mallory, a high school humanities teacher in Alberta, Canada. "I do not see how to build a system that works for everyone, especially if you are trying to teach a certain set of skills or knowledge that everyone has to learn."

Incorporating tech in the classroom

Just changing the system is a huge challenge. Textbooks – let alone pedagogical approaches – can take years to update and reform. How can schools be adapted to cope with fast-moving technological change? "It is very expensive to update education systems constantly, and impossible to manage politically," Mallory says.

Perhaps new technologies could be part of the solution. "Artificial intelligence could help by developing and adjusting the curriculum, individually, every month, based on their performance," Mallory says. With computers helping take care of part of their jobs, teachers could focus on giving children individual attention.

There are concerns to this increasingly automated approach to learning. Mallory worries that personalised curricula risk making education itself impersonal. "We use technology to allow the students to move at their own pace and do their own projects," she says, "but then their learning is not connected with their surroundings."

The solution may be a mixture of strategies: Classroom learning and field trips, technology and human contact, and working in large groups so that children develop social skills, all while personalising learning through individual tutoring. No matter what, our approach to education – and our teachers – has to be flexible to keep up with a society changing at an exponentially faster rate. ◆

Dominic Barton

WHEN HOME IS A WINDOW SEAT

JET SET – Some business leaders and creative minds have to constantly travel for work. How does this change the meaning of home and family life?

CECILIA ARREGUI &
SAMUEL LINDBLAD (TEXT)
LUKAS RAPP & TOBIAS SCHREINER (PHOTO)
KATIE CHAPPELL (ILLUSTRATION)

Dominic Barton's black overnight bag has travelled hundreds of thousands of miles. Inside a zippered pocket are odds and ends: Letters from his mother, family pictures, and other small presents. He finds it funny when, once in a while, the airport workers screening his luggage look at him with a strange face. And, when he has the chance of staying in the same hotel for a few nights, he takes those items out and places them on a shelf or bedside table. The objects Barton carries around are his way of feeling at home while away.

And Barton travels a lot: As global managing partner of McKinsey & Company, he was on the road 300 nights in 2017. Running a firm and being constantly on the move is a lifestyle that many young people desire. For some, it is a status symbol, and a way to merge work with adventure. The spread of the Internet and the decreasing cost of transportation have allowed many entrepreneurs and "creatives" to become digital nomads. But how does this change the meaning of home? Is it a sustainable way to live?

Flights are a means to an end

Headquarters in London, staff in Barcelona, wife in New York, family in Milan, and a company active in 113 countries: Brian Pallas, CEO of Opportunity Network, likes to say he lives on a plane. In the last year, he took over 300 flights. Roughly, that works out to six flights a week.

When he wakes up, the first thing Pallas asks is: "Am I on a plane or a bed?" For him, flying is amazing. His phone does not constantly ring while in the air. He rarely sees take-offs and landings, since he is usually asleep. He travels light, with only a backpack. He says it all comes down to loving what you do. "That way travelling is worthwhile because of what it achieves," he says. Flights are a means to an end, and not the other way around."

Not everybody thinks in such practical terms. Yumna Al-Arashi is an American artist based in London. She travels a lot, first to shoot her films and then to present them in festivals. She sees the possibility of moving around almost as an act of protest. Half Yemeni and half Egyptian, she is aware of the privileges her US passport gives her. Most of her family can't leave the Middle East.

"The younger version of me would say 'Oh my God! How cool, how exciting!'" Al-Arashi says. "But, you know, it kind of loses its magic after a while." For her, moving around is not sustainable in the long-term. Not for her body, not for the environment, and not for her mental health. ↦

When you're travelling most of the year, little things can make a hotel room feel a little more like home. We asked four road warriors at the symposium what they bring with them while on the go.

Antoine Levy: **A novel in French**

Yumna Al-Arashi: **Her father's school ID**

Remembering their roots

Growing up in a rural Canadian town, just going to Vancouver once a year was a big deal for Barton. "We could not travel much, but my parents would tell me stories about different countries and what was going on there while having dinner at the kitchen table," he says. He always dreamt of exploring the world. Now, once in a while, he wishes he was not on a plane.

The idea that living as a nomad changes the definition of home seems clear cut. It becomes a somewhat fluid concept, in Al-Arashi's words. It is not a place anymore, but simply where the people you love are.

Florence Brigat, a Tahiti-born Frenchman living in London, recalls how his father would always manage to make it home before he was asleep as a child – though cannot imagine a scenario in which he would have time to start a family. "Travelling so much certainly is glamorous, but I would want to have as much time for my children as possible," Brigat says. "That does not seem possible right now. I am happy as I am."

Family relationships are a recurring theme. Levy defines the trade-off between wanting to settle down and the desire to explore the world as a matter of priorities at any given time in a person's life. "Ideally, I would just start a family and then take them everywhere with me," he laughs.

"The last time I saw my father was the first time we saw each other in four years," Al-Arashi says. Still, he is always with her: she has been carrying around his school ID from the American University in Cairo, from when he was young, everywhere she goes. "It is a nice reminder of what he did for me to be able to have the privileges that I have to make what I can do right now."

Global versus local

"McKinsey has offices in 65 countries, so I will never be able to do my job effectively sitting in one place," says Barton. Pallas, Brigat and Al-Arashi find themselves in a similar situation. So do many others. Barton is certain that, although it's a minority lifestyle today, the travel trend will continue to grow. "I still think the world will be more global," Barton says. "Ideas cross borders. You have got to interact with people, you have got to see markets."

On the other hand, technology also enables some people to live more locally. Workers whose jobs can be done digitally sometimes decide to move to small communities. "I think that it is amazing to be able to raise a family in a quiet place and still be able to be global at that level," Barton says.

Yet being a digital nomad comes at a cost. Al-Arashi, for example, tries to cut other things out of her life to balance her own carbon footprint. Meeting diverse people is what Pallas likes the most. But, even for the most extroverted travellers, in the long run constant travel tends to be lonely. There is also the risk of becoming untethered. "I think you need a base for

Florence Brigat: **A bracelet**

Brian Pallas: **A laptop charger to stay connected**

resilience," Barton says. "You get setbacks in life and you need people and spaces that make you feel safe."

All about disciplines

So what does it take to survive – and thrive – as a digital nomad? "I need to stress this strongly," warns Barton. "It is possible to travel 300 nights a year and still find a balance in life." It is vital to find an equilibrium between family, a partner, work, and hobbies. And vital to possess the discipline to make it all work: Exercising, reading books, playing music. Looking ahead in the calendar and finding the right moments to spend time with loved ones, even if it requires moving things around. Finding a peer to share experiences with and talk about life.

A bracelet, a book, an old student ID from her father. A bag full of family memories. There is always something that makes these people feel safe, somewhat at home. Many young professionals are starting to follow in Barton's footsteps. Slowly, he is getting prepared to pass his punishing routine on to the next generation: This summer, he plans to step down from his globe-trotting leadership role. "What I am trying to do now is putting my things in order," he says. "But you do not need to wait until you are over 50, you can start to find discipline during your first year of work." ◆

HAVE WE REACHED THE END OF RETIREMENT?

AFTER WORK – An ageing society. An unaffordable social security system. Old people working longer, youngsters looking for work. Is it time to rethink how we organise our working lives?

CECILIA ARREGUI & RANA KHALED (TEXT)

Counting the days until Friday. Packing up your office, saying goodbye to your colleagues, and going home. From Monday on, being idle. The idea of cliff-edge retirement is rarely appealing anymore. Life after work is a fast-changing concept that needs to be adapted to modern times.

Working longer

Yair Piña López is a Mexican physics student who works as an analogue astronaut for NASA. He goes on missions that simulate Mars' conditions on Earth to conduct research that will help design future trips to that planet.

However, as much as he may love his job, Piña plans to retire at around 35 in order to have time to build a family. Lisa Kikuchi, a Japanese entrepreneur in the agri-tech business, dreams of retiring at around 40, to enjoy her life and think about what she has achieved. "Maybe after a decade I'll have the energy again and decide to go back to work and start something new," she says.

Such unorthodox life plans reflect a new reality: Some well-educated young people want their retirement to differ radically from that of their parents. "The Japanese government may be able to support my father and his generation, but I cannot expect the same when my time comes," says Kikuchi, who is 29.

Kikuchi's attitude reflects a growing understanding that individuals must prepare for retirement: Workers need to plan the lifestyle they want and save the money they will need. Yet early retirement, the way she or Piña imagine it, is a luxury that the vast majority of the world population cannot even dream of. So, is retirement really a planned decision or more about individual circumstances?

Given that people are healthier for longer, the trend seems to be towards people retiring later, not earlier. Many workers have the capacity and motivation to carry on working for longer than the traditional retirement age. Rather than a so-called "cliff-edge" retirement, numerous people are opting for a phased leave-taking, explains George Magnus, a British economist and author of the book "The Age of Ageing." They either do something else a few times a week or keep working in their chosen fields on a part-time or flexible basis.

According to Matt Flynn, the director of the Centre for Research into the Older Workforce in the UK, "what defines the right time for a person to retire is when they are capable of leaving work and have the desire to do so." Everybody should have a stake in managing their career, he says.

For some people, of course, it is much easier to continue working than for others. It becomes especially hard for those who have jobs that require physical strength, such as construction workers, paramedics or firefighters. A better model needs to be created, "in which people can change roles later in life, similar to how younger people change jobs," says Flynn.

Lump of labour fallacy

Not everyone agrees. "Just because you are living longer does not mean that you should cling to your formal job. You should leave space for the younger generations," says Bogolo Kenewendo, who became Botswana's Cabinet Minister of Investment, Trade, and Industry in April 2018.

Magnus, however, argues that the belief that there is a fixed amount of work available is what economists call the "lump of labour" fallacy, which seem intuitive at first but lacks empirical evidence to back it up. "In fact, we can let older people keep working or have different occupations for longer in life," Magnus says. "That should not take away the jobs that might otherwise go to younger people, which will probably be different jobs anyway." And, at least in the Western world, the ageing problem is not so much about people living longer, but about not having enough children.

But for Kenewendo, making room is not just about vacating a position. She says older people must monitor and direct the younger generations in order "to bridge the gap." For the 30-year-old economist and politician, retiring means leaving a formal job – but not stopping impact work.

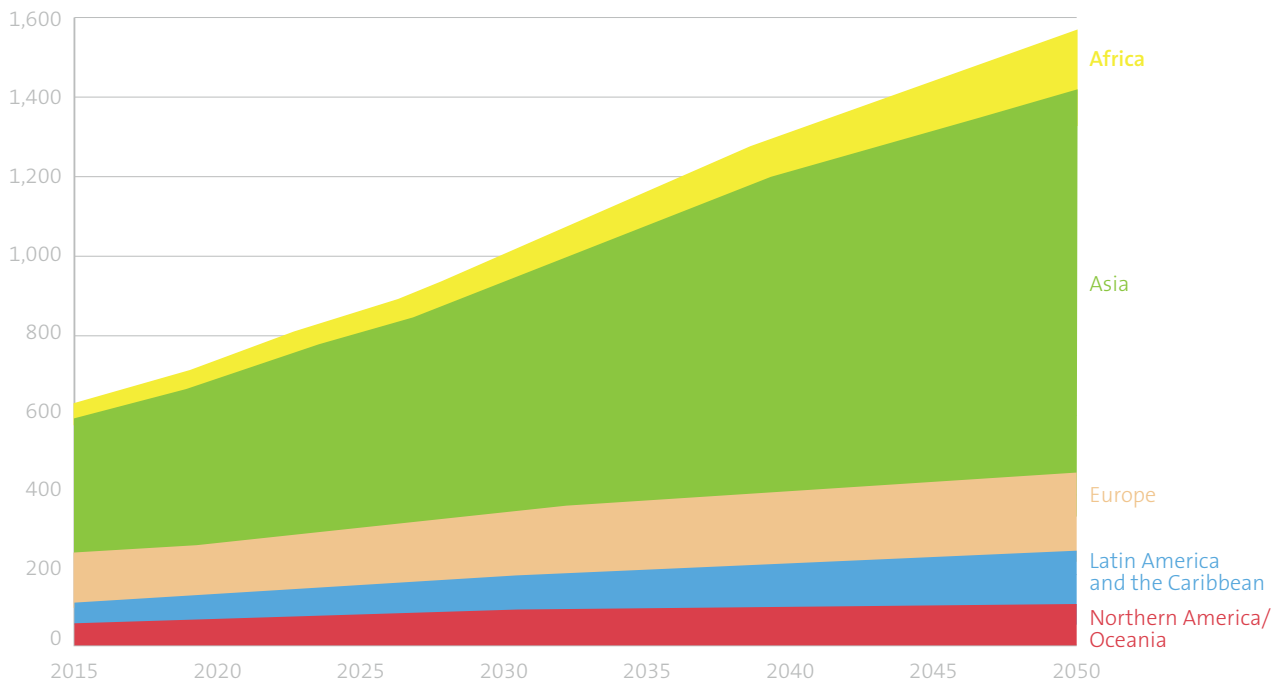
Dream retirement

According to Magnus, the social security system is a clear priority when it comes to making different forms of retirement possible. It needs to be changed and adapted: the commitment governments have made to provide pensions and healthcare will someday become unaffordable.

This challenge is something that the younger generation should think about: After all, they are the ones with the strength to demand changes and the ones most affected. But not all have opinions as clear as Piña, Kikuchi, and Kenewendo. Magnus admits it is usually hard to get young people interested in this topic. "People tend to start thinking about retirement when it is almost time for them to retire," he says.

That, experts say, is too late. "We need to have a grown-up discussion about entitlements and the tax burden," says Magnus. "We have to find a ways to fund the ageing society that go beyond simply raising revenues. This is very much about education and productivity." ◆

The number of people aged 65 and over is expected to more than double in the next 30 years, from 600 million worldwide to over 1.5 billion by 2050. The most dramatic increases will be in Asia and Africa.



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TECH IS TOO WHITE. AND THAT'S A PROBLEM

AI BLUES – Inclusion results in better products, more money and happier customers. So why is the tech sector still struggling with diversity?

LAURIANNE CROTEAU & CHRISTINE HAAS (TEXT)
LUKAS RAPP & TOBIAS SCHREINER (PHOTO)


Pavan Kumar

Google News' algorithms associated "he" with "doctor" and "she" with "nurse." Microsoft's AI chatbot Tay pledged allegiance to Hitler within hours of being online. COMPAS, a risk-assessment programme, predicted black defendants were more likely to commit further crimes than they actually were.

Artificial intelligence software is typically coded by white, young and privileged men – with consequences in terms of how they learn and function. But the bias carried by these algorithms may only be the tip of the iceberg when it comes to tech's impact on society. "Artificial intelligence can do good," says Ayesha Khanna, CEO of ADDO AI. "It can reduce disease, it can democratise access to infrastructure for the poor, but tech is a double-edged sword. And unless we manage it carefully, it could also do harm."

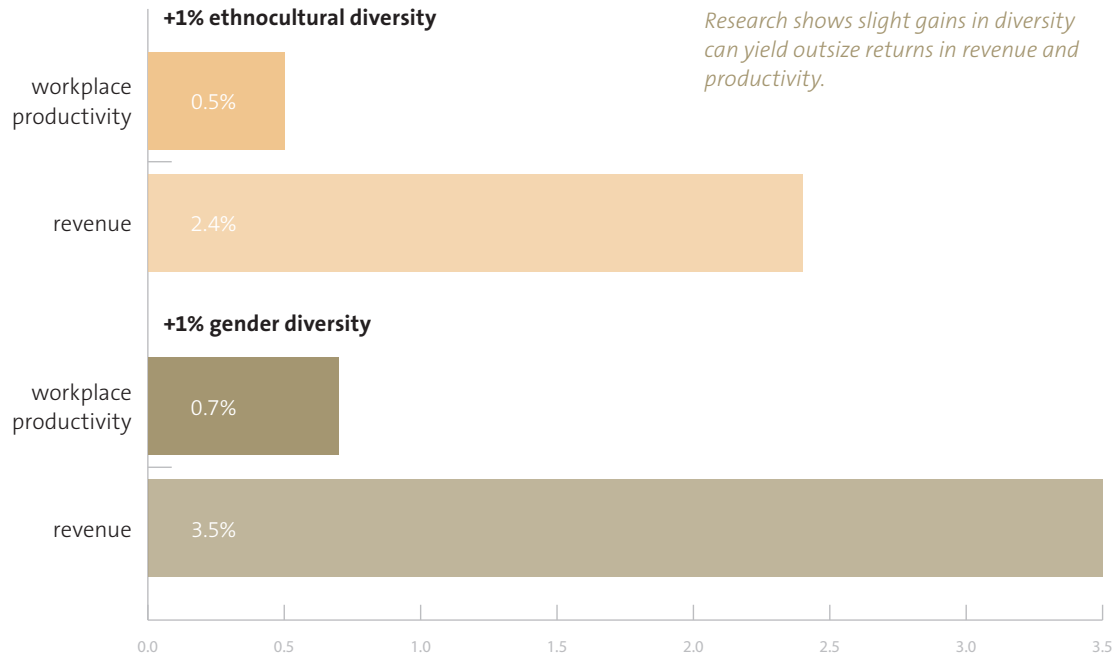
AI algorithms have repeatedly been racist, sexist and, well, biased. The problem is, the industry itself does not even know what lies under the surface. "In the world of AI, it is common knowledge that there are potential issues and pitfalls with the technology," says Heather Evans, advisor in advanced technologies for the Ministry of Economic Development and Growth of Ontario, Canada. "But there is not yet a good understanding of what these broad issues are."

However, awareness is growing, and there are solutions out there regarding biased algorithms. "It is never too late! These codes are written by human beings. A lot of these biases come from poor data. You have to add more data, diversify the data, and retrain the model," says Khanna.

Khanna can also imagine AI looking after itself eventually. "AI could be programmed to inspect other algorithms as they evolve and get fed more data."

A diverse team: the win-win situation

A diverse company culture not only helps create products that are fit for a broader audience, but also products that last longer. "If the objective of a team is to create a product which delivers a service, then your customers are probably a diverse group of people," Evans says. "You need to understand them, and it is very hard to understand the per-



Research shows slight gains in diversity can yield outsize returns in revenue and productivity.

source: https://www.cigionline.org/sites/default/files/documents/DiversitySpecial%20Report%20WEB_0.pdf

spective of someone whose life experience is so different than your own."

So why does the tech industry have such a hard time creating truly diverse workplaces? Some insiders blame the pipeline. "In engineering, there are definitely fewer female candidates with minority backgrounds who have a wide range and depth of experience," explains Pavan Kumar, co-founder & CTO of Cocoon Cam, which develops smart monitors to screen babies while they are sleeping. Kumar knows from first-hand experience how hard it is to create diversity in a start-up; 90 percent of the applications he gets are from men. What, then, is the best way to hire people from different backgrounds, ages, genders, and perspectives?

According to Zabeen Hirji, advisor on the future of work at Deloitte, the answer lies in changing the human resources department. "When you are going to hire from universities, you should take care to attract a diverse group of students," she says. "And that means that the people you send on campus recruiting visits should actually be diverse."

Khanna, meanwhile, argues that the solution lies in broadening the company's reach. "I look increasingly at hiring digital talents, people who work remotely," she says. "The moment I expanded my horizons, both in terms of geographical boundaries and whether I was hiring someone full time, part time, or as a consultant, my pool of talents got much bigger, and there was a higher chance that I found diverse talents."

Just hiring a diverse team is not enough: Companies must also include everyone in the debate. "As a leader, you want to empower your team so that they can have an opinion, so that they are heard," says Evans. "Because it is one thing for someone to have a comment, and it is another thing to be taken seriously."

Everyone, in other words, is responsible for creating representative AI. "We have to demand transparency and accountability with our algorithms," says Khanna. "We cannot be passive: We have to force and compel ourselves as human beings, but also the companies and the governments, to provide that sort of accountability." ◆

Heather Evans

"HOW ARE YOU FEELING TODAY, HUMAN?"

DR DATA – The biomedical sphere is making leaps and bounds in diagnosis and treatment thanks to data analytics and AI. But what does this mean for the role of the human physician?

KIZZY BRAY (TEXT)
LUKAS RAPP & TOBIAS SCHREINER (PHOTO)

Data analytics have begun to transform the world of medicine. An algorithm that can scan databases of randomised controlled trials, as well as actual patient outcomes, is something pretty revolutionary, if you think about it. If the whole world used data analytics, then a doctor's visit could potentially leave you with more answers than questions and concrete treatment plans rather than the usual "we could try you on this."

Rather than destroying healthcare jobs, in other words, AI has the potential to create the time and tools needed to make doctors more "human" again. "Data analytics and deep learning, transfer learning, machine learning, all these algorithms, are means for me to make best use of the existing data," says Claudia Süssmuth Dyckerhoff, a member of the board of directors for Roche Pharmaceuticals who holds a PhD in business administration from the University of St. Gallen.

Receiving a whole stream of data, including information collected by at-home wearable devices that will feed back to the hospital and track a patient's progress, means that a doctor's job will include a lot less uncertainty. "It's not about replacing jobs," Süssmuth Dyckerhoff explains, but "rather about using analytics to improve support."

But here's the fear: if AI can scan databases of every treatment plan, every randomised controlled trial, every case study ever, will certain jobs in healthcare become meaningless? Can a robot do a better job of diagnosis and treatment plans than a human ever could?

The answer is not so clear cut. Radiologists, for example, may be at risk, but according to Süssmuth Dyckerhoff radiologists are in short supply in countries like China to begin with. "What is important is training your own people to be ready," she says. "Some people need to be retrained. More data could even create jobs."

Technology is already making significant inroads. A team at Stanford University recently introduced an AI therapist dubbed "Ellie." The programme uses voice recognition, image recognition, and can scan hundreds of databases to provide appropriate responses to the patient. "Machine learning has been going on for years, but it's still early in terms of its use in healthcare," says Harvard University medical student Joshua Onyango. "If this is what it can do so far, in terms of providing very personalised healthcare, what can we imagine it doing in 20 or 25 years?"

Eventually, experts think robots might even allow doctors to be more human, so to speak. When it comes to the innate uncertainty that surrounds disease, treatment, side-effects, and mental health, sometimes a patient really needs a person to talk to. But physicians in today's overburdened healthcare system struggle with that task. Sometimes doctors simply just do not have the resources or time to be as holistic as we want them to be.


Claudia Süssmuth Dyckerhoff

Orest Firsov, an entrepreneur at New Body Technology, a digital healthcare service that tracks posture for users – many who have chronic health conditions – points out the fundamental benefit of AI in medicine. Automation that takes away the burden of "routine checkups and assessments" means doctors have more free time to be both more competent and more caring. Understaffing has left healthcare workers unavoidably robotic in practice, and perhaps we need AI to re-

lieve the burden of routine work as a way to restore humanity to medicine.

Not to be taken lightly, this time to humanise the patient could save healthcare jobs in the age of AI. "One thing that machines are going to have a very difficult time doing," Onyango says, "is understanding the cultural and emotional nuances that make us human." Tasks such as navigating social norms, symbolism, body language and empathy – all the little things that make us human and separate us from AI – will be difficult for robots to accomplish.

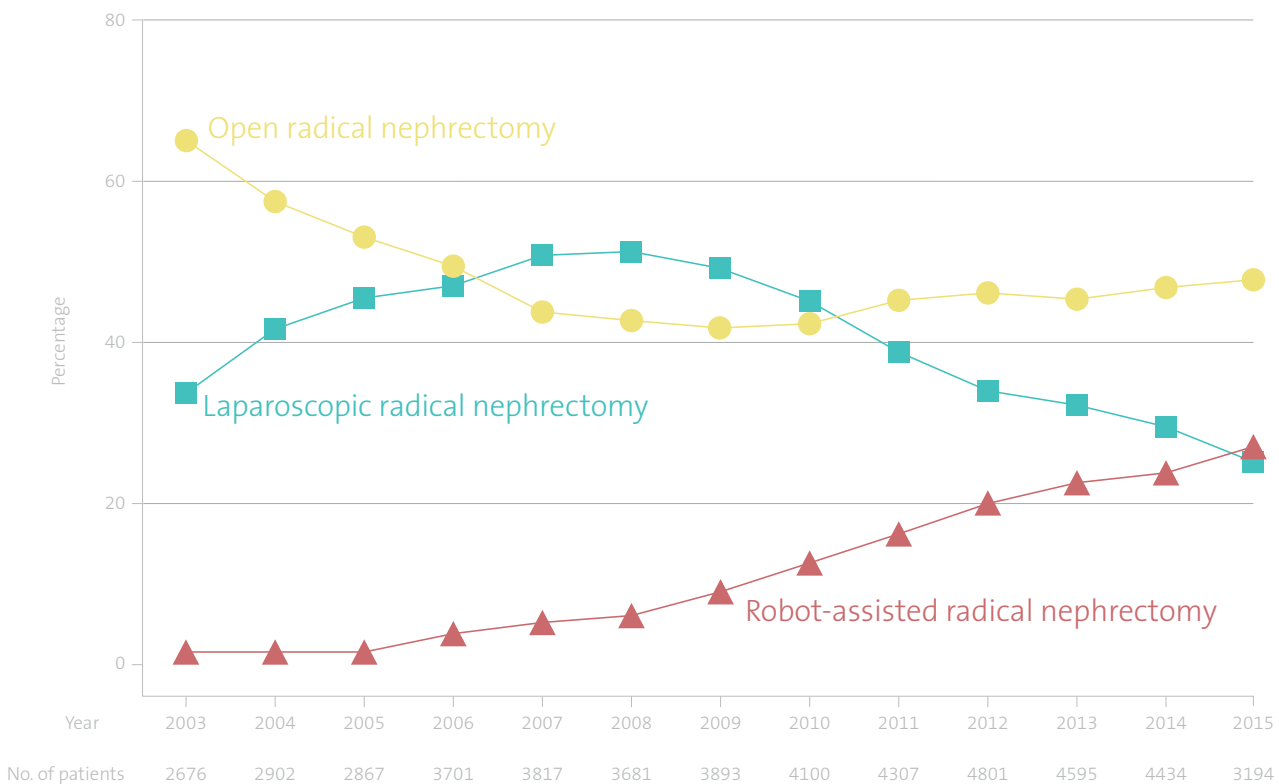
According to Valeriia Kasatkina, a Leader of Tomorrow researching the connectedness of Australia's social support systems for domestic abuse victims, AI could also help mobilise policy and care. If we have data analytics to help improve communication between the healthcare and social work sectors, then the role of the social care worker will become more efficient.

"On the organisational level, using data collection and information sharing platforms could provide relevant information about victims," Kasatkina says. This is vitally important for issues in cases of domestic violence. "Victims could have mental health issues, a child, or problems with drug addiction," Kasatkina says. "Drawing connections means all of their health and social care services could be coordinated."

The world of medicine and healthcare is changing, but for now, it seems that the changes are for the better. As long as doctors, healthcare providers and carers can fill the gaps left by machines, providing patients with the human touch, then there really is room for both man and machine in the future of healthcare. "The hospital will always be a space with a human touch," Süssmuth Dyckerhoff says. "Health is so human." ◆

Joshua Onyango

Numbers below each year represent the total number of patients receiving radical nephrectomy.



source: https://jamanetwork.com/journals/jama/fullarticle/2658321

NEW CLASS – Even if we can guarantee everyone in the world a decent standard of living, some people will always have more. The lopsided presentation of the good life on social media, meanwhile, raises hopes and expectations that are bound to be dashed.

SAMUEL LINDBLAD (TEXT)

THE INEVITABLE UNDERCLASS

Our expectations for how the world should be have changed dramatically over time. The lives of the average middle-class worker in 2018 and that of the average worker in 1918 are pretty much incomparable. As Nat Ware, a consultant and winner of the St. Gallen Wings of Excellence Award in 2017 and 2018 states, the lives most of us lead now are more opulent than those the royalty of earlier centuries enjoyed.

Yet somehow we are still unhappy. Stress and the use of anti-depressants has skyrocketed, and suicide is the most common cause of death in most parts of the world. The idea that having more equates to being happier – a concept that many of us accept without question – can effectively be thrown out of the window.

The expectation gap

This year's St. Gallen Wings of Excellence Award winner has presented research on this idea of social expectations before. In a 2014 TedX talk, Nat described this dissonance between expectations and reality as "the expectation gap." That is why, he says, we set the bar of what a life should be so high that we almost always fail to reach the standards we have set for ourselves.

There are, of course, other factors at play. Economic problems like job insecurity and rampant inflation certainly contribute to depression and sadness. Political divisions that polarise society and foster hostility among communities likely factor in, too.

But, in a world framed by social media, in which each user presents only the best aspects of their own lives, we cannot discount the role of the expectation gap in dictating how happy we are as individuals.

By surrounding ourselves with narratives that increase our expectations, we inadvertently condition our brains to believe that we should, for example, be a CEO by the age of twenty-five, or only eat vegan, organic bowls of quinoa. Our ability to absorb and internalise the media around us becomes even more dangerous when understood in light of the influencer economy and the distributed marketing techniques used by companies to subtly advertise products and services through promotions framed as genuine posts.

Dangerous influence

The failure to distinguish advertisements from real posts is something that Ware said was considerably more dangerous than traditional forms of media. His solution to the problem, though unlikely to be imposed by social media giants, would be to ensure that all advertisements were marked as sponsored, even if they were subtly presented by Instagram users.

The ability of social media to increase the expectation gap in terms of what constitutes a "good life" has profound consequences for a world beyond work. Universal basic income schemes have been deemed instrumental in building a better society, creating more space for creativity, reducing stress and helping tackle the trend towards poverty associated with long-term unemployment.

Yet wellbeing (at least above subsistence level) is very strongly linked to self-perception. People whose lives are improved by a universal basic income guarantee, for example, may still find themselves gazing upwards through the distorted lens of social media at people whose Instagram accounts seem to ooze opulence.

By continuing to shift our expectations through social media, we create a space for an entrenched underclass. It does not matter that those at the bottom are much better off than they would have been in the past in absolute terms. Nor does it matter that they are better off than dead kings. What matters is that, in an hierarchical system, those with less perceive themselves as less valued and valuable. In the absence of some grand awakening that dismisses unrealistic ideas of how a life should be lived, social media may in fact prove a powerful driver for social inequality. ◆

FUTURE FACTOR: SOCIETY

SAMUEL LINDBLAD (TEXT)
TOBIAS SCHREINER (PHOTO)

Lorenzo Schirato

"AI and automation are definitely going to fundamentally change the nature of research," says Lorenzo Schirato, a quantitative economic researcher from Italy. Modelling economic trends is a task he believes will be delegated to AI in the future. Because economics relies heavily on quantitative ability and advanced statistical modelling techniques, it often excludes those without technical training. "AI helps reduce the barriers to work in economic research, since those who are not as good at quantitative analysis will not be excluded from the discipline," Schirato says. The inevitable intertwining of economics with political, sociological and behavioural research will only be helped by the introduction of automation in the sector.

Yassmin Abdel-Magied

Though technological advancements have been touted as a solution to many industrial and work-related problems, their ability to transform how we communicate as individuals has received less attention. Yassmin Abdel-Magied is a mechanical engineer and women's rights advocate who worked for several multinational engineering firms after graduating from the University of Queensland. She uses social media to raise awareness, but platforms like Twitter and Facebook have exposed her to attacks that target her identity as a Muslim woman. "My hope for future technologies would be that they could be used to apply the social norms we have in real life to the online world," she says. A less hateful Internet would be in everyone's interest.

Naveen Tenetti

"The moments that I treasure each day are the five minutes that I spend with a patient," says Naveen Tenetti, a medical doctor and consultant at the Nossal Institute for Global Health in Australia. "The more I can delegate to AI, the more time I can spend with a patient figuring out how the complex ecosystem that is their body fits within the complex ecosystem that is society." Empathy, he says, is the most important aspect of medicine – and the ability to connect with patients is not something AI can easily replicate: "Without having to spend so much time on administrative functions and diagnostic processes, doctors can focus much more on wellbeing. I think that is one of the greatest things that could come from this technology."

"PEOPLE DERIVE DIGNITY FROM THEIR WORK."

BACK TO SCHOOL – The most important skill for the future is knowing how to learn, says former White House Chief of Staff Denis McDonough. "Fluency in technology is the easiest part of the equation."

JON MARTÍN-CULLLELL (TEXT)
LUKAS RAPP (PHOTO)

Denis McDonough used to go on night walks with President Obama at the end of the work day. In the course of one stroll, Obama told him about a technology which had struck him during a trip to San Francisco: A new device which could compare one X-ray image against millions of others. "It could be more precise and come to conclusions faster and, therefore, would be cheaper than if a doctor examined it," says a man who, as Obama's White House Chief of Staff, used to be responsible for 4,000 staffers. "The President said to me that being a radiologist used to be a good job, but that maybe it was going to disappear." That conversation stuck in his mind. When his time at the White House came to an end in 2017, he decided to focus on the topic of work, an issue he considers key for national security. "Our ability to handle the transition and effectively employ artificial intelligence has considerable implications for national security."

Technology has clear advantages but, at the same time, it could make many jobs redundant. Do you think the fear many workers have of losing their jobs is well-founded?

The fears are well-founded. At the same time, they might not be entirely accurate. However, the point is not to explain away somebody's fears: The point is to address them. The best way to do that is to ensure that our schools are performing at their best and that people have options to refresh their skills when they get out of formal schooling.

Whose responsibility is it to retrain? Should it be left to companies or be taken into governments' hands?

We need to reform the entire ecosystem of labour markets, which includes employers, educators, and workers. Our goal should be to bring greater transparency. Companies need to be more clear about the skills they need. Educators have to offer them on the marketplace, so that the worker can learn that skill. Local, state and federal governments also need to be part of this reform.

What skills do think workers should focus on acquiring if they want to cope well with the coming transition?

Obviously, there has to be a baseline fluency with technology, but I think this is the easiest part of the equation. The most important skill is knowing how to learn. In this economy, you are going to have to constantly retrain yourself. It will require a mental shift. Right know, we believe that you are done once you have gone through four years of college and that, from then onwards, all further training will be taken care of by your company. That is a mistake. If we do not build realistic options for people to continue to learn, we are going to fall back as a country.

President Trump's rhetoric on reviving the coal industry might have encouraged workers' hopes that there is still a future in their jobs. How do you make sense of this?
The important lesson here is that people derive a lot of meaning, worth and dignity from their work. Secondly, I think what we see in in the US is not a reflection of a hope of any particular job coming back, but a manifestation of the unease that there are no alternatives. As policymakers, we should enunciate a clear set of alternatives. The change that we have witnessed in the coal industry is a reflection of technology and the price of natural gas. President Trump, instead of looking into job alternatives for the future, is painting a picture that looks backwards.

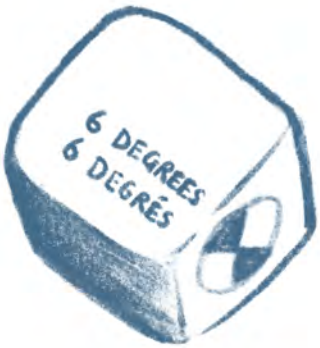
Can his discourse be an obstacle to the new skills agenda?
It could be, to a certain degree, an obstacle. But there are much bigger ones: the fact that the price of college is growing at astronomical rates, or the fact we have not removed the stigma from certain jobs. That is something President Trump could do a quite good job of changing. The way he shows such pride in miners and factory workers sends a very positive signal. I just wish it were on jobs those aspirations could be fulfilled in, rather than in sectors which, because of major technology developments, are becoming less labour-intensive.

Is there any job that robots will never be able to replace?
If you look at the past, the kind of tasks that got replaced were repeatable, less cognitive and less sociable ones. Machines do certain things extraordinarily well and efficiently. However, the things they do poorly they do very poorly. We should move towards a future where robots are not replacing humans, but teaming up with humans. In that scenario, I think you will see great productivity gains and, as a result, great wage gains, provided we make the investments we need for retraining and reskilling. ◆

Denis McDonough

Denis McDonough worked as an aide to the US Congress' House Foreign Affairs Committee before moving on to work for different senators. He served as senior foreign policy advisor during Barack Obama's 2008 election campaign. After Obama's victory, he joined the National Security Council, of which he became Deputy Head. He then served as White House Chief of Staff during Obama's entire second term. In 2017, he joined the Markle Foundation, where he focuses on employment issues. He is also a visiting fellow at the Carnegie Endowment for International Peace.

Adrienne Clarkson



THE 'BEAUTIFUL CHAOS' OF 6 DEGREES ST. GALLEN

CANADA CALLING – 6 Degrees conferences aim to bring conversations on inclusion to the forefront. Its first conference in St. Gallen was held this year. The conversations involved a wealth of audience participation, which was both challenging and self-reflective.

KIZZY BRAY (TEXT)
LUKAS RAPP (PHOTO)
KATIE CHAPPELL (ILLUSTRATION)

The 48th St. Gallen Symposium marked the first collaboration with the 6 Degrees event, organised by the Institute of Canadian Citizenship. The goal was to provoke conversation about inclusion and exclusion, and what steps we should be taking in order to create more ethical and tolerant societies.

The 6 Degrees conference itself included workshops and panels on a round stage. The main aim was to include the audience in the conversation. To that end, 6 Degrees staff threw around mobile microphones encased in soft, plush cubes.

In keeping with the symposium's topic, the day began with a panel on "Economies." The conversation revolved around diversity and inclusion within businesses and the workforce, with the speakers dedicating their mic time to talking about why such ideas are beneficial to companies and employees alike.

One of the speakers was Yulkendy Valdez. Her organization, Project 99, is focused on fostering millennial talent. She was enthusiastic about the 6 Degrees concept. "As someone who has lived this, as an immigrant to the United States, but also through the work I do, it's important," says Valdez.

Though 6 Degrees had featured speakers, it was unusual in its efforts to share the floor with the audience – many of whom had criticisms that needed to be discussed openly. One audience member, Yassmin Abdel-Magied, raised the issues she had working as an engineer for Shell, where panelist Peter Voser once worked as CEO. As a black, Muslim woman, Abdel-Magied found the claims Voser made on stage in regards to the inclusivity and diversity in his workforce to be somewhat off the mark in regards to her own experience.

This dramatic exchange set off a conversation around the room about what it means to fill hiring quotas and how, in fact, we must look beyond diversity numbers to make workspaces inclusive in a much deeper, rooted sense, such as working on diversity, acceptance beyond who you hire, and listening to workers about their issues and experiences. "Talk to ↦

me, not about me," Abdel-Magied said, a line which yielded applause from the rest of the room.

The unusual format and engaged audience got rave reviews. "This is exactly what needs to happen," Valdez says. "Often you go to a conference or a panel and listen. Maybe you get to ask a few questions at the end. But this is the kind of beautiful chaos that we need. I'm sure not everybody walked out satisfied, but that's better than not having the conversation at all."

The conference – which began as a three-day event in Toronto last year – is partly the brainchild of Adrienne Clarkson, a former Governor General of Canada. The intent is to be more inspirational than academic. "This is not a study of anything," Clarkson says. "It is involvement, it is a movement."

Clarkson describes the symposium as "super-national" – and as a perfect fit for a "super-portable" event like 6 Degrees. "I think it's very interesting to have points of view that are very different [among] people who are thinking about the same things, people want to share their ideas about belonging and inclusion, with or without natural borders," she says. "That's what it's all about: the movement of people, the movement of ideas."

The collaboration originated with Scott Young, one of the symposium's former Leaders of Tomorrow, who now works for 6 Degrees. After Young suggested a collaboration, the organisers saw the promise of working together. "Inclusion is something that should matter," says Rolf Bachmann, the St. Gallen Symposium vice-president.

Societies

In the next panel, on "Societies," the audience was asked whether people are naturally inclusive or exclusive. At one point Aya Chebbi, founder and chair of the Afrika Youth Movement, handed the mic to Abdel-Magied, who spoke articulately on the subject of representation. Her speech detailed the systemic discrimination Abdel-Magied had experienced in her line of work. "I'm tired," she said – tired of being the only black Muslim woman in her office, and tired of being "expected to be grateful."

Abdel-Magied had the eyes and ears of every member of the room glued to her. "The things that we are talking about are not abstract, they are our, they are my lived experiences. This stuff matters. This stuff is important. This stuff destroys people's lives," she said. "It's about history. It's about people saying 'Pick yourselves up by your bootstraps,' when there was a systematic, concerted campaign by colonists over hundreds and hundreds of years to destroy people so they would not be able to pick themselves up by their bootstraps."

Later in the session, Abhijit Sinha, co-founder of Project DEFY, a company which builds "nooks" of technology in developing communities to show people how to teach themselves – gave an impassioned presentation of his observations on how societies exclude refugees. He was impressed that there was room for dialogue during the event. "The interesting thing about the programme is that it actually does allow for difference of opinion, and there was difference of opinion," he said. "It is great to let that happen, and allow challenging points of views to come forward. I would like to see this happen in the very grassroots, where people have not been allowed to have an opinion."

The wide-ranging discussion at the event did not cover everything. For example, one audience member pointed out that the St. Gallen Symposium and its participants are very much part of the global elite. In such an elite room, perhaps the topic of inclusion should have elicited more discussions on economic redistribution. But that seemed to be lost amongst other, equally vital conversations.

According to audience member Celia Ramirez, a health practitioner from Mexico, 6 Degrees was an important space for listening and hearing different perspectives. "But this is just the first step," she said. "The second step would be a 6 Degree analysis of what happened afterwards. Let's meet again, let's follow up on what was said and what happened afterwards. Let's not just leave it there." ◆

TAKING FLIGHT – How has the symposium influenced the lives of former participants? For the 30th edition of the student essay competition, some former qualifiers came back to St. Gallen. Here are three of their stories.

CHRISTINE HAAS (TEXT)
LUKAS RAPP & TOBIAS SCHREINER (PHOTO)

WINGS OF EXCELLENCE ALUMNI

Geoffrey See

Bringing volunteers to North Korea to do training in entrepreneurship and business was an unpopular idea before Geoffrey See came to the symposium for the first time. "No one believed that the North Koreans were interested in this kind of knowledge or willing to change anything," See says.
However, after explaining his ideas to McKinsey's Dominic Barton and other Leaders of Today, he felt so encouraged that he created Choson Exchange, a Singapore-based organization that has provided training to over 8,000 North Koreans since See founded it in 2007. "We're thinking about bringing people from North Korea to the next symposium," See says. "That would bring them great exposure."

Kamil Mroz

The example of the International Students' Committee made the then-undergraduate Kamil Mroz feel that young people can have enormous impact. Taking them as a role model, he initiated a youth leadership scheme in Canada and North America to tackle the growing problem of unemployment in 2009. "I could convince a lot of professionals with political and economic backgrounds to give advice to young people on how to find a job," Mroz says. Many of the ones formerly receiving advice are now involved in high positions – even members of provincial parliaments – themselves. "Today I see the impact of what has begun in St. Gallen, and that is a great feeling."

Ashwini Vanishree

Before Ashwini Vanishree came to the 45th St. Gallen Symposium, she could not imagine getting much response to her ideas on preventing violence and abuse. Competing with students from the best universities around the globe – whose essays were mainly focussed on economics – made her feel insecure. After winning the competition, she felt encouraged: "People understood it is a topic, and that gave me so much confidence," Vanishree says. Right after returning to India, she started MUKTHA, a foundation supporting people who are in danger of physical abuse or mental illness. "Sometimes a little bit of acknowledgement is all that matters," says Vanishree.

WORK HARD, NAP HARD

TOBIAS SCHREINER (TEXT & PHOTO)

Some people are busy, other people are busier. And others are so busy that they barely find time to sleep. Therefore, many are perfecting the art of napping: Companies like Uber, Google and Ben & Jerry's install nap rooms for their employees, claiming that these make their workers happier and more productive. The Student Union of the University of St. Gallen runs a relaxation room with a wake-up service in the main building that was widely used during the lunch breaks or in between lectures at the symposium.

The nap as a method of quick revitalisation is the result of constant negotiation: How to maximise the benefits of sleep in a limited time. How much time do I need to invest to restore my body's energy? And even though a quick nap might be better than caffeine, it is not a solution for long-term sleep deprivation. The minimum amount of sleep one should get per night is six hours. Eight is ideal. If you cannot function without regular naps, this might be a sign your lifestyle is taking a toll on your body. Sleep is not like a bank: You cannot go into debt and pay it back later.

SPEAKERS

Each year, a distinguished faculty of eminent international personalities explores and develops its views on present and long-term issues in business, politics and society with a focus on economic processes within their relevant environments. This year, the following speakers joined the symposium:

Dirk Ahlborn
Co-Founder & Chief Executive Officer
Hyperloop Transportation Technologies Inc.

Grant Allen
Managing Director & Head of Ventures
ABB Technology Ventures (ATV)

Prof. Ronald C. Arkin
Regents' Professor & Director of the Mobile Robot Laboratory, College of Computing
Georgia Institute of Technology

Dominic Barton
Global Managing Partner
McKinsey & Company, Inc.

Cathy Benko
Vice Chairman & Managing Principal
Deloitte LLP

Marc P. Bernegger
Board Member
Crypto Finance AG

Bob Bland
Co-President
Women's March

Volkhard Bregulla
Vice President Global Industries Manufacturing and Distribution
Hewlett Packard Enterprise

Tyler Brûlé
Founder, Chairman & Editor-in-Chief
Monocle

Prof. Stephan Chambers
Director, The Marshall Institute for Philanthropy and Social Entrepreneurship
London School of Economics (LSE)

The Right Honourable Adrienne Clarkson
Co-Chair
Institute for Canadian Citizenship &
26th Governor General of Canada

Alain Dehaze
Chief Executive Officer
The Adecco Group

Rajeeb Dey
Founder & Chief Executive Officer
Learnerbly

Matt Flynn
Director
The Centre for Research into the Older Workforce

Steve Forbes
Chairman & Editor-in-Chief
Forbes Media

Nigel Fretwell
Chief Human Resources Officer
Swiss Re

Sigmar Gabriel
Member of the German Parliament &
Vice Chancellor of Germany 2013–2018

GAOWA Wulin
Director, Design Center
Beijing Electric Vehicle Co., Ltd

Dileep George
Co-Founder & Chief Technology Officer
Vicarious, Inc.

Lord Griffiths of Fforestfach
Vice Chairman
Goldman Sachs International

Prof. HE Fan
Professor of Economics
Peking University HSBC Business School

HO Kwon Ping
Founder & Executive Chairman
Banyan Tree Holdings Limited

Thebe Ikalafeng
Founder & Group Chief Executive Officer
Brand Leadership

Marianne Janik
General Manager
Microsoft Switzerland

Philip J. Jennings
General Secretary
UNI Global Union

Bogolo Kenewendo
Minister of Investment, Trade and Industry
Republic of Botswana

Ayesha Khanna
Co-Founder & Chief Executive Officer
ADDO AI Pte Ltd

Sung-Joo Kim
Chairperson & Chief Visionary Officer
MCM Holding AG

Hiroaki Kitano
President & Chief Executive Officer
Sony Computer Science Laboratories, Inc.

Elena Kvochko
Cybersecurity Expert & Technology Executive

Doris Leuthard
Federal Councillor of the Swiss Confederation

Gabriel Lim
Permanent Secretary
Ministry of Communications and Information of Singapore

Violet Lo
Founder & Director
Inclusive Business Lab & Inclusive Business Foundation

Adrian Locher
Founder
Merantix GmbH

George Magnus
Associate
University of Oxford China Centre

Philippa Malmgren
Founder
DRPM Group

Masatoshi Matsuzaki
Chairman of the Board of Directors
Konica Minolta, Inc.

Denis McDonough
Visiting Senior Fellow
Carnegie Endowment for
International Peace

Thomas D. Meyer
Country Managing Director
Accenture Switzerland

Michael Møller
Director-General Geneva Office
United Nations

Mona Mourshed
President & Chief Executive Officer
Generation

Mohandas Pai
Chairman
Manipal Global Education Services Pvt Ltd

Jacqueline Poh
Chief Executive Officer
Government Technology Agency
of Singapore (GovTech)

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Member of the Board of Management,
Human Resources & Director of Labor
Relations, Mercedes-Benz Vans
Daimler AG

Monika Ribar
Chairwoman of the Board of Directors
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Mark Riedl
Associate Professor
Georgia Institute of Technology

Jeremy Rifkin
President
Foundation on Economic Trends

Marek Rosa
Founder, Chief Executive Officer &
Chief Technology Officer
GoodAI

Susanne Ruoff
Chief Executive Officer
Swiss Post

Ruchika Sachdeva
Managing Director of Data Science
Practice & Applied Intelligence
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John Ralston Saul
President Emeritus
PEN International

Wolf-Henning Scheider
Chief Executive Officer
ZF Friedrichshafen AG

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Founder & Chief Executive Officer
Moya Power

Se-kyeong Song
Founder & Chief Executive Officer
FutureRobot

Prof. Guy Standing
Professorial Research Associate
University of London

Roberto Suárez Santos
Secretary-General
International Organisation of
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Minister for National Development and
Second Minister of Finance of Singapore

Nasir Zubairi
Chief Executive Officer
The LHoFT Foundation

TOPIC LEADERS

Topic Leaders act as ambassadors of the St. Gallen Symposium and through their presence and role promote dialogue between the generations. In doing so, they bring together the Leaders of Today and the Leaders of Tomorrow. This year, the following Topic Leaders joined the symposium:

Yassmin Abdel-Magied
Founder & Chief Executive Officer
Mumtaza

Prof. Omid Aschari
Managing Director, Master in Strategy and International Management
University of St. Gallen

Prof. Thomas Bieger
President
University of St. Gallen

Alexander Stephan Böhm
Associate Professor, School of Management
University of St. Gallen

Fabian Buder
Project Manager Future and University Programme
GfK Verein

Peter Day
International Journalist

Aiko Doden
Senior Commentator
NHK (Japan Broadcasting Corporation)

Katrin Eggenberger
Chief of Staff, Office of the Executive Chairman
World Economic Forum

Marcela Escobari
Senior Advisor at the Mastercard Center for Inclusive Growth &
Visiting Fellow at The Brookings Institution

Heather Evans
Senior Advisor in Artificial Intelligence and Quantum Technology
Government of Ontario

Peter Fischer
Economics-Editor-in-Chief
Neue Zürcher Zeitung

Prof. Elgar Fleisch
Director, Institute of Technology Management
University of St. Gallen

Prof. Christoph Frei
Associate Professor, School of Economics and Political Science
University of St. Gallen

Jason George
J.M. George, Inc.

Urs Gredig
Editor-in-Chief
CNNMoney Switzerland

Akash Gupta
Co-Founder & Chief Technology Officer
GreyOrange

Nils Hagander
Founder, Client Service Partner & Member of the Board of Directors
a-connect

Sigvald Harryson
Founder & Chief Executive Officer
iKNOW-WHO AB

Erwin Hettich
Manager Venturing and Ecosystems
Helvetia AG

Andrew Hill
Management Editor & Columnist
The Financial Times

Prof. Caspar Hirschi
Professor of History
University of St. Gallen

Rolf Hoefer
Partner
Rhetorical Crypto Capital

Riz Khan
International Journalist

Myriam Locher
Partner
Blackboat Internet GmbH

Leslie Maasdorp
Vice President & Chief Financial Officer
New Development Bank

Ritesh Malik
Founder & Managing Director
Innov8

Prof. Jean-François Manzoni
President and Nestlé Chaired Professor
IMD – International Institute for Management Development

Alexander C. Melchers
General Manager & Director
C. Melchers GmbH & Co. Singapore Branch

Ricardo Neiva Tavares
Ambassador
Embassy of Brazil to Austria

Andreas Neus
Deputy Managing Director
GfK Verein

Pranav Pai
Founding Partner
3one4 Capital

Prof. Jesse Ramirez
Assistant Professor for American Studies
University of St. Gallen

Alexandre Robicquet
Research Assistant
Stanford University

Prof. Winfried Ruigrok
Dean, Executive School of Management, Technology & Law
University of St. Gallen

Stephen Sackur
Presenter HARDtalk
BBC News

Viswa Sadasivan
Chief Executive Officer
Strategic Moves

Nina dos Santos
Europe Editor
CNN International

Pranjal Sharma
Consulting Editor
BW Businessworld

Prof. Siri Terjesen
American University, Washington, DC

Prof. Klaus W. Wellershoff
Chief Executive Officer,
Chairman of the Board & Partner
Wellershoff & Partners Ltd.

Felix Wenger
Senior Partner & Managing
Partner Switzerland
McKinsey & Company, Inc.

PLENARY SESSIONS

On both days of the symposium, Plenary Sessions were held in which prominent speakers introduced the major topics, discussed controversial issues and provided impetus for the upcoming sessions. The sessions were moderated by the Topic Leader to ensure that the participants had a voice in the discussions.

THURSDAY

INTRODUCTION
Three leaders from three generations present their visions on the topic "Beyond the end of work".

WELCOME
Lord Griffiths of Fforestfach (GB), Goldman Sachs International

WELCOME THE FEDERAL GOVERNMENT
Doris Leuthard (CH), Federal Counsellor of Switzerland

DEBATE: SETTING THE SCENE
Philip J. Jennings (GB), General Secretary, UNI Global Union
Roberto Suárez Santos (ES), Secretary-General, International Organisation of Employers (IOE)
Topic Leader: Nina dos Santos (GB), Europe Editor, CNN International

CHALLENGES FOR EUROPE IN THE NEW INTERNATIONAL CONSTELLATION – PERSPECTIVES FOR WORK, INNOVATION AND ECONOMIC PROSPERITY
Sigmar Gabriel (DE), Member of the German Parliament & Vice Chancellor of Germany 2013–2018

BEYOND THE END OF WORK
Philippa Malmgren (IE/US), Founder, DRPM Group
Prof. Guy Standing (GB), Professorial Research Associate, University of London
Marcus Wallenberg (SE), Chairman of the Board of Directors, SEB (Skandinaviska Enskilda Banken) AB
Topic Leader: Marcela Escobari (US/BO), Senior Advisor, Mastercard Center for Inclusive Growth & Visiting Fellow, The Brookings Institution

ONE-ON-ONE
Dominic Barton (CA), Global Managing Partner, McKinsey & Company, Inc.
Topic Leader: Stephen Sackur (GB), Presenter HARDtalk, BBC News

ANNIVERSARY SESSION:
30TH ST. GALLEN WINGS OF EXCELLENCE AWARD
The top six contributors to the St. Gallen Wings of Excellence Award pitch their ideas to an Expert Panel.

Stephan Chambers (GB), Director, The Marshall Institute for Philanthropy and Social Entrepreneurship, London School of Economics (LSE)
Thebe Ikalafeng (ZA), Founder & Group Chief Executive Officer, Brand Leadership
Elena Kvochko (US), Cybersecurity Expert & Technology Executive

A selection of St.Gallen Symposium impact stories

Keynote speech on the occasion of the 30th St. Gallen Wings of Excellence Award:
Steve Forbes (US), Chairman and Editor-in-Chief, Forbes Media

Host of Jubilee Session: Jason George (US), J.M. George, Inc.

WRAP-UP THURSDAY
Jason George (US), J.M. George, Inc.

A CONVERSATION WITH MONA MOURSHED
Mona Mourshed (EG/US), President & Chief Executive Officer, Generation
Topic Leader: Nina dos Santos (GB), Europe Editor, CNN International

BACKGROUND SESSION

IOT AND ITS IMPACT ON SOCIETY
Volkhard Bregulla (DE), VP Global Industries Manufacturing and Distribution, Hewlett Packard Enterprise
Hiraki Kitano (JP), President & Chief Executive Officer, Sony Computer Science Laboratories, Inc.
Marianne Janik (FR/DE), General Manager, Microsoft Switzerland
Topic Leader: Prof. Elgar Fleisch (AT/CH), Director, Institute of Technology Management, University of St. Gallen

FRIDAY

WELCOME
Lord Griffiths of Fforestfach (GB), Goldman Sachs International

LECTURE: THE SMART THIRD INDUSTRIAL REVOLUTION AND THE FUTURE OF WORK
Jeremy Rifkin (US), President, Foundation on Economic Trends
Followed by a conversation with Lord Griffiths of Fforestfach (GB), Goldman Sachs International

NEXT GENERATION WORKFORCE – A READINESS ANALYSIS
Alain Dehaze (BE), Chief Executive Officer, The Adecco Group
Dileep George (US), Co-Founder, Vicarious, Inc.
Lawrence Wong (SG), Minister for National Development and Second Minister of Finance ofSingapore
Topic Leader: Nina dos Santos (GB), Europe Editor, CNN International

ONE-ON-ONE
Denis McDonough (US), Visiting Senior Fellow, Carnegie Endowment for International Peace
Topic Leader: Stephen Sackur (GB), Presenter HARDtalk, BBC News

TECHNOLOGY IN THE SPOTLIGHT: FUTURE OF TRANSPORT
Dirk Ahlborn (DE), Co-Founder & Chief Executive Officer, Hyperloop Transportation Technologies Inc.
GAOWA Wulin (CN), Director Design Center, Beijing Electric Vehicle Co., Ltd
Wolf-Henning Scheider (DE), Chief Executive Officer, ZF Friedrichshafen AG
Topic Leader: Pranjal Sharma (IN), Consulting Editor, BW Business World

TECHNOLOGY IN THE SPOTLIGHT: ROBOTICS
Prof. Ronald C. Arkin (US), Regents' Professor, Georgia Institute of Technology
Topic Leader: Pranjal Sharma (IN), Consulting Editor, BW Business World

WORKPLACES THAT WORK: A CALL FOR DIVERSITY!
Cathy Benko (US), Vice Chairman and Managing Principal, Deloitte LLP
Bob Bland (US), Co-President, Women's March
Sung-Joo Kim (KR), Chairperson & Chief Visionary Officer, MCM Holding AG
Topic Leader: Andrew Hill (GB), Management Editor & Columnist, The Financial Times

CLOSING SESSION
Tyler Brûlé (CA), Founder, Chairman & Editor-in-Chief Monocle
Topic Leader: The Right Hon. Adrienne Clarkson (CA), Co-Chair, Institute for Canadian Citizenship & 26th Governor General of Canada

WRAP-UP FRIDAY & PRESENTATION OF THE ISC TEAM
Jason George (US), J.M. George, Inc.

BACKGROUND SESSION

HUMANITY'S TO-DO LIST FOR A BETTER FUTURE
Michael Møller (DK), Director-General Geneva Office, United Nations
Topic Leader: Prof. Christoph Frei (CH), Associate Professor, School of Economics and Political Science, University of St. Gallen

WORK SESSIONS

The Work Sessions are the core element of the St. Gallen Symposium. They complement and expand on the Plenary Sessions and allow participants to directly exchange their opinions and experiences. In groups of about thirty participants, the Work Sessions provide the opportunity to take part in intense debates.

The new way of building companies in the internet age
Dirk Ahlborn (DE), Co-Founder & Chief Executive Officer, Hyperloop Transportation Technologies Inc.
Topic Leader: Sigvald Harryson (SE), Founder & Chief Executive Officer, iKNOW-WHO AB

A revolution in military affairs: A future of robots, warfighters, and the battlefield
Prof. Ronald C. Arkin (US), Regents' Professor & Director of the Mobile Robot Laboratory, College of Computing, Georgia Institute of Technology
Topic Leader: Riz Khan (GB), International Journalist

Become CEO of your career
Cathy Benko (US), Vice Chairman and Managing Principal, Deloitte LLP
Topic Leader: Nils Hagander (CH), Founder, Client Service Partner & Member of the Board of Directors, a-connect

How crypto assets are changing the (working) world
Marc P. Bernegger (CH), Board Member, Crypto Finance AG
Topic Leader: Rolf Hoefer (DE), Partner, Rhetorical Crypto Capital

The leaders we've been waiting for: Applying Women's March principles in business
Bob Bland (US), Co-Founder, Women's March
Topic Leader: Yassmin Abdel-Magied (SD/AU), Founder & Chief Executive Officer, Mumtaza

"Out-teach" your competition: Using learning as your competitive advantage
Rajeeb Dey (GB), Founder & Chief Executive Officer, Learnerbly Limited
Topic Leader: Pranav Pai (IN), 3one4 Capital, India

Active ageing through social partnership and industrial relations expertise
Matt Flynn (GB), Director, The Centre for Research into the Older Workforce
Topic Leader: Alexander Stephan Böhm (DE/CH), Associate Professor, School of Management, University of St. Gallen

Utopia, dystopia or neither? How AI will change work and society
Dileep George (US), Co-Founder, Vicarious, Inc
Topic Leader: Riz Khan (GB), International Journalist

Privacy in the era of big data
Prof. HE Fan (CN), Professor of Economics, Peking University HSBC Business School
Topic Leader: Peter Fischer (CH), Economics-Editor-in-Chief, Neue Zürcher Zeitung

The duality of technological change
HO Kwon Ping (SG), Executive Chairman, Banyan Tree Holdings Limited
Topic Leader: Viswa Sadasivan (SG), Chief Executive Officer, Strategic Moves

Africa does not need jobs
Thebe Ikalafeng (ZA), Founder & Chairman, Brand Leadership Group Ltd
Topic Leader: Ricardo Neiva Tavares (BR), Ambassador of Brazil to Austria

Global unions: Future impact on business and human rights
Philip J. Jennings (GB), General Secretary, UNI Global Union
Topic Leader: Prof. Jean-Francois Manzoni (CA/FR), President and Nestlé Chaired Professor, IMD – International Institute for Management Development

The future of work in an era of AI and automation
Ayesha Khanna (PK), Chief Executive Officer, ADDO AI Pte Ltd
Topic Leader: Myriam Locher (CH/DE), Partner, Blackboat Internet GmbH

New leadership for new workforce
Sung-Joo Kim (KR), Chairperson & Chief Visionary Officer, MCM Holding AG
Topic Leader: Prof. Winfried Ruigrok (NL), Dean, Executive School of Management, Technology & Law, University of St. Gallen

Cybersecurity as an enabler of growth
Elena Kvochko (US), Cybersecurity Expert & Technology Executive
Topic Leader: Katrin Eggenberger (LI), Chief of Staff, Office of the Executive Chairman, World Economic Forum

Challenges of the nation state in the digital age
Doris Leuthard (CH), Federal Councillor of Switzerland
Topic Leader: Prof. Christoph Frei (CH), Associate Professor, School of Economics and Political Science, University of St. Gallen

The future of work in a future-ready Singapore
Gabriel Lim (SG), Permanent Secretary, Ministry of Communications and Informaton of Singapore
Topic Leader: Prof. Jesse Ramirez (US), Assistant Professor for American Studies, University of St. Gallen

Never too young to lead
Violet Lo (GB/HK), Founder & Director, Inclusive Business Lab & Foundation
Topic Leader: Ritesh Malik (IN), Founder & Managing Director, Innov8

Artificial intelligence, the next core purpose technology? From human enhancement to market disruption
Adrian Locher (CH), Founder, Merantix
Topic Leader: Erwin Hettich (DE), Manager Venturing & Ecosystems, Helvetia AG

How will ageing societies work?
George Magnus (GB), Associate, University of Oxford China Centre
Topic Leader: Prof. Klaus W. Wellershoff (CH), Chief Executive Officer, Chairman of the Board & Partner, Wellershoff & Partners Ltd.

Cambridge analytica and the future of work
Philippa Malmgren (IE/US), Founder, DRPM Group
Topic Leader: Leslie Maasdorp (ZA), Vice President & Chief Financial Officer, New Development Bank

Management for sustainable growth: The revolution begins at the border
Masatoshi Matsuzaki (JP), Chairman of the Board of Directors, Konica Minolta, Inc.
Topic Leader: Aiko Doden (JP), Senior Commentator, NHK (Japan Broadcasting Corporation)

Skills for the 21st century digital economy
Denis McDonough (US), Visiting Senior Fellow, Carnegie Endowment for International Peace
Topic Leader: Viswa Sadasivan (SG), Chief Executive Officer, Strategic Moves

Employment for all in the new world of work
Mona Mourshed (EG/US), President & Chief Executive Officer, Generation
Topic Leader: Felix Wenger (CH), Senior Partner & Managing Partner Switzerland, McKinsey & Company, Inc.

India@2030: How Tech Entrepreneurship will create a $10 Trillion Economy
Mohandas Pai (IN), Chairman, Manipal Global Education Services Pvt Ltd.
Topic Leader: Pranjal Sharma (IN), Consulting Editor, BW Businessworld

Embracing the end of work: Living in a smart nation
Jacqueline Poh (SG), Chief Executive Officer, Government Technology Agency of Singapore
Topic Leader: Peter Day (GB), International Journalist

Siri, Alexa & Co. on the rise – brave new world around the corner?
Wilfried Porth (DE), Member of the Board of Management, Human Resources & Director of Labor Relations, Mercedes-Benz Vans, Daimler AG
Topic Leader: Andrew Hill (GB), Management Editor & Columnist, The Financial Times

The current approach to work is a direct attack on new generations
John Ralston Saul (CA), Co-Chair & President Emeritus, Institute for Canadian Citizenship & PEN International
Topic Leader: Lord Griffiths of Fforestfach (GB), Goldman Sachs International

Getting ready for the mobility of the future
Monika Ribar (CH), Chairwoman of the Board of Directors, Swiss Federal Railways SBB AG
Topic Leader: Prof. Thomas Bieger (CH), President, University of St. Gallen

AI creativity, entertainment, and work
Mark Riedl (US), Associate Professor, Georgia Institute of Technology
Topic Leader: Heather Evans (CA), Senior Advisor in Artificial Intelligence and Quantum Technology, Government of Ontario

Redefining the nature of work in a smart, digitally connected glocal society
Jeremy Rifkin (US), President, Foundation on Economic Trends
Topic Leader: Prof. Caspar Hirschi (CH), Professor of History, University of St. Gallen

Artificial intelligence: making a smooth transition to a radically restructured society
Marek Rosa (CZ), Founder, Chief Executive Office & Chief Technology Officer, GoodAI
Topic Leader: Alexandre Robicquet (FR), Research Assistant, Stanford University

New corporate life – getting ready for tomorrow's employees
Susanne Ruoff (CH), Chief Executive Officer, Swiss Post
Topic Leader: Sigvald Harryson (SE), Founder & Chief Executive Officer, iKNOW-WHO AB

Large enterprises vs. start-ups: The constant quest for innovation
Wolf-Henning Scheider (DE), Chief Executive Officer, ZF Friedrichshafen
Topic Leader: Prof. Omid Aschari (CH), Managing Director, Master in Strategy and International Management, University of St. Gallen

A happier future? Creating permanent positive emotions thanks to smart robots
Se-kyeong Song (KR), Chief Executive Officer, FutureRobot
Topic Leader: Akash Gupta (IN), Co-Founder & Chief Technology Officer, GreyOrange

The precariat under rentier capitalism
Prof. Guy Standing (GB), Professorial Research Associate, University of London
Topic Leader: Stephen Sackur (GB), Presenter HARDtalk, BBC News

Future of business as a driver in the work of tomorrow
Roberto Suárez Santos (ES), Secretary-General, International Organisation of Employers (IOE)
Topic Leader: Nina dos Santos (GB), Europe Editor, CNN International

Automation in Healthcare – and what does it mean for the human workforce?
Claudia Süssmuth Dyckerhoff (DE), Member of the Board, Hoffmann-La Roche AG and Clariant AG
Topic Leader: Riz Khan (GB), International Journalist

Will we run out of work in Switzerland?
Valentin Vogt (CH), President, Swiss Employers Confederation
Topic Leader: Urs Gredig (CH), Editor-in-Chief, CNNMoney Switzerland

Making our cities work better
Lawrence Wong (SG), Minister for National Development and Second Minister of Finance of Singapore
Topic Leader: Alexander C. Melchers (CH/DE), General Manager & Director, C. Melcher GmbH & Co. Singapore Branch

Evolving financial services
Nasir Zubairi (GB), Chief Executive Officer, The LHoFT Foundation
Topic Leader: Leslie Maasdorp (ZA), Vice President & Chief Financial Officer, New Development Bank

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ISC TEAM

LOÏC FAVRE (TEXT)
MATTHIAS BLANK (PHOTO)

The St. Gallen Symposium is influenced by the members of the International Students' Committee to an extent that we probably cannot measure. Each and every year, 30 extremely motivated young people with very different backgrounds come together to work for the future of our generation.

What I was most astonished by was how much fun we had, while working so hard. I believe the 48th ISC Team was defined by the inclusion of every single one of the team members, by the respect we had for one another and by the capacity to accomplish more together than each individual might have alone. This unique team spirit gave us the amazing opportunity; to innovate, to challenge and to hold on to our core values.

MAGAZINE TEAM

RUBEN DIELEMAN (TEXT)
LUKAS RAPP (PHOTO)

You are looking at the creators of this magazine.

This group of talented people worked under high pressure, in and outside of this newsroom, to make sure that the conversations at the 48th St. Gallen Symposium would continue in print and online. Their creativity, ingenuity, drive, and professional attitude was impressive, especially because I mostly witnessed what happened from inside of the newsroom. Most of the magic happened while they were somewhere out on the campus reporting, illustrating, or photographing. As the editor in chief, I had the wonderful chance to be a part of this diverse team. Tobias Schreiner, Kizzy Bray, Samuel Lindblad, Stefanie Diemand, Katie Chappell, Cecilia Arregui, Christine Haas, Sebastian Beug, Kalendra Withanaarachchi, Rana Khaled, Jon Martín-Cullell, Laurianne Croteau – remember these names, for they may appear at the top of some breaking news story or insightful piece you will be reading in a couple of years. I am so glad and thankful to have worked together with them.

In the newsroom, Andrew Curry, Manuel Heckel, Tu Loan Huynh, Brian Tagle, Carla Baum, and Loïc Favre provided me with the absolutely essential support that was needed to make this magazine. I could not have done without their comments, feedback, and their sharp eye, both for detail and the bigger picture. Thank you all so much, I thoroughly enjoyed working together with you!

From left to right:

Tobias Schreiner
Manuel Heckel
Kizzy Bray
Loïc Favre
Samuel Lindblad
Brian Tagle
Stefanie Diemand
Katie Chappell
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