

Everything under control?
How we steer our lives
between autonomy and
dependence.

AUTOonomy

COVER STORY AUTOnomy:

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Determining the position: The *Polarstern*, a German research vessel, is at sea in the central Arctic Ocean. Frozen to an ice floe, the icebreaker will be spending a year drifting around with the sea ice. There are 300 scientists from 19 countries on board working in shifts. The biggest Arctic expedition in history is researching the climate system of the North Pole region as the epicenter of global warming. Its goal is to achieve a better understanding of climate change and collect data to develop more accurate climate models. Where is the *Polarstern* now? Follow the ship at www.mosaic-expedition.org. 





together

WHO AM I? THE QUEST FOR THE INNERMOST SELF, FOR WHAT MAKES US AND EIGHT BILLION OTHER INDIVIDUALS UNIQUELY HUMAN, HAS PREOCCUPIED US FOR AS LONG AS WE HAVE LIVED. WE FIND ANSWERS AS WE ENCOUNTER SOCIAL, CULTURAL, AND POLITICAL CONCEPTS THAT DEVIATE FROM OUR OWN. HAVING THE FREEDOM TO LEAD INDIVIDUAL LIVES IS WHAT DRIVES MORE ADVANCED SOCIETIES.



Rabeya and Rukaya (3) are Siamese twins from Bangladesh. Their bodies grew together inside the womb at an early stage of development. Twins like these occur approximately once in every one million live births. Most are joined superficially, while others share organs or limbs. In 2 percent of cases, the twins are joined at the head, like Rabeya and Rukaya. A team of 35 Hungarian doctors succeeded in separating the siblings in a 33-hour operation in August 2019. Both are healthy and can now begin their lives as autonomous siblings. But the siblings continue to share a special bond. It is usually the most enduring social connections humans have. It is involuntary and can be full of love and affection, conflicts and rivalry, or both at the same time. Scientists claim that the childhood relationship between brother and sister plays a significant role in determining our behavior. For example, we apparently assume our usual sibling position from our family in partnerships and peer groups, often subconsciously. Whether we show dominance or fit in well with others is not only up to us. The special bond between siblings can never be completely severed. 

$d=25'$
Light = "red"
 σ/\sqrt{n}

$d=9' 6''$
 $\sigma=.5''$
 σ/\sqrt{n}

Just imagine: A self-driving car with a driver on board is approaching a pedestrian crossing signal. Two children suddenly start crossing the street against the signal. How should the car react? Should it run over the children and protect the driver? Or should it veer away into oncoming traffic, killing the driver and potentially other innocent bystanders? It is a moral dilemma with no solution. And yet, if we want machines to act autonomously in our midst, we need to determine which behavior is more acceptable. The Media Lab at the Massachusetts Institute of Technology has now launched a trial with its Moral Machine. Situations like the one described above can now be interactively simulated at www.moralmachine.mit.edu. Not only do the results help the researchers to develop the decision-making rules for artificial intelligence – they are also a sure-fire way to wreak havoc with our own moral compass. @

autonomous

1 OR 0, LIFE OR DEATH: AUTONOMOUS MACHINES ARE DOING MORE THAN JUST TAKING OVER COMPLEX TASKS. THEY ARE ALSO MAKING MORE AND MORE DECISIONS THAT AFFECT OUR BODIES AND OUR LIVES. WE ARE ALREADY ACCUSTOMED TO NOTION OF PEOPLE DETERMINING THE FATE OF OTHER PEOPLE. BUT HOW MUCH POWER ARE WE SURRENDERING TO THE MACHINES AND HOW MUCH AUTONOMY ARE WE KEEPING?





Around one billion people currently reside in the 50 biggest cities in the world – and the figure is rising. Megacities are therefore becoming increasingly important for their national economies. As a result, a global competition has emerged between cities for capital, the best minds, expertise and creativity. The big city is refining its image, usually according to some variation of the promise of being “greater, smarter, and more sustainable.” While features such as digital infrastructure and low tax burdens are attractive to companies, cosmopolites also value soft factors such as cultural diversity and recreational value. Spectacular structures are the most essential and visible element of this city branding, such as the 2.3-kilometer long High Line park, which was built between 2006 and 2019 on an old freight rail line on Manhattan’s West Side. It receives seven million visitors per year. Throughout the world, iconic architecture – in forms as diverse as skyscrapers, museums, or spectacular parks – has become a symbol of how megacities strive to be unique, and how globalization determines and standardizes the reality of our lives and work. ☐

Taking Responsibility

OUR FREEDOM IS OUR MOST PRIZED POSSESSION. WHEN USED CORRECTLY, DIGITALIZATION CAN HELP US TO MAKE OUR LIVES MORE FLEXIBLE AND THUS SELF-DETERMINED. THIS DOESN'T JUST APPLY TO OUR PRIVATE LIVES – DIGITALIZATION HAS BECOME INCREASINGLY INFLUENTIAL IN THE WORLD OF WORK. GREATER AUTONOMY AND SELF-DETERMINATION BENEFIT BOTH **INDIVIDUALS** AND **COMPANIES** – AND THAT'S WHY NOW IS THE TIME TO CREATE THE IDEAL FRAMEWORK CONDITIONS.

Digitalization is fundamentally changing the way in which we live, work, and communicate. The seemingly infinite options offered by new tools and services across all areas of life have created opportunities for even greater self-determination that were previously inconceivable. Elderly and disabled people, for example, want to be able to live independently and at home for as long as possible. Age-appropriate assistance systems and networked smart home components for everyday life make living independently a possibility. However, one prerequisite for the acceptance and success of such solutions is that they do not restrict people in terms of their data privacy and personal rights. If this is not the case, we will have to pay a very high price.

TRUSTING EMPLOYEES

The trend towards gaining greater autonomy has been a mainstay in the world of work for a while now. Thanks to digital possibilities, many people can now avail themselves of greater freedom and flexibility in their work – at least in theory – as technology has made it possible to work irrespective of time or place. But this must be accompanied by a new understanding of how work is organized. If employees want to take on more responsibility for how their work is set up, then their managers have to be willing to trust them. Self-determined work doesn't equal irregularity, haphazardness, or a lack of discipline. For managers, this means having to further develop so that they can continue to lead successfully in this era of "new work." At the same time, it means that employees – especially young professionals – have to approach their new-found independence with a sense of responsibility. After all, working is all about learning from different experiences, seeing ideas through, and becoming both efficient and effective. In other words: It's about demonstrating loyalty to the company and its values and objectives, and in turn showing appreciation towards employees in a re-negotiated working relationship. Digital natives want to find more meaning in their work, rather than just material and economic security to maintain their lifestyles. The attitude their company has towards them is becoming increasingly important to them – they don't simply want to rise through the ranks at any price. For that reason, successful companies need to be able to balance the relationship between responsibility and freedom to create loyalty among both employees and customers. **■**

Dr.-Ing. Michael Fübi
Chief Executive Officer
TÜV Rheinland





Here I am, human

INTERNAL EXPERIENCES AND OUTSIDE INFLUENCES HAVE ALWAYS WORKED IN TANDEM TO SHAPE OUR PERSONAL IDENTITY. BUT NOW THAT WE LIVE IN A DIGITAL SOCIETY, **SELF-DETERMINATION IS BECOMING INCREASINGLY DIFFICULT**. ARE WE UP TO THE CHALLENGE?

Do you believe your destiny is in your own hands? Are your thoughts really free? Your favorite meal, which shoes you will put on today, which people you call your friends – are those really your own decisions? Proponents of the sim-

ulation hypothesis only have one answer to these questions. And that answer is no. At this point, it does not even have anything to do with marketing departments, advertising, and fake news influencing our consumer choices and behavior. Influential scientists are actually discussing the



possibility that we ourselves, our lives as a whole, the Earth, the solar system, and even our entire perception of the universe could be nothing but a simulation, a digital reality determined by others from start to finish, generated by gigantic, high-performance computers. It is unclear who is behind this simulation. It could be our descendants, a highly evolved version of humans, who regard us as something like an entertaining video game. There is also speculation that an alien civilization or an all-powerful god has created it all. Swedish Philosopher Nick Bostrom is the creator of the simulation hypothesis, a theory that seems crazy at first. His paper “Are You Living in a Computer Simulation?” has been making waves since its publication in 2003. Cosmologists and philosophers believe that it is entirely possible that our world is only a digital creation and that every

thought, every perception, and every action is calculated by computers. Some even assume that the notion that the physical universe is actually real could at some point be as obsolete as the geocentric view of the world. Others, such as astrophysicist and Nobel Prize winner George Smoot, are more cautious, but nevertheless unwilling to exclude the theory as a model for explaining the world. The most prominent supporter of the simulation hypothesis is probably the tech visionary and Tesla and SpaceX founder Elon Musk.

VIRTUAL VERSUS REAL WORLD

Upon closer examination, the idea that our highly advanced civilization will one day have enough computing power and energy to recreate the lives of billions of individuals in a computer program

“HERE I AM HUMAN, I CAN BE HUMAN HERE!” – THIS QUOTE FROM GOETHE’S “FAUST” TAKES ON A NEW MEANING IN THE DIGITAL ERA: IN VIRTUAL SPACES, WE CAN LEAD A SECOND EXISTENCE AS A COMPLETELY DIFFERENT PERSON, IF THAT IS WHAT WE WANT.

is not that far-fetched. We have been moving in this direction for a long time. 3D virtual reality headsets and touch controllers already allow us to plunge into simulated worlds today, which use increasingly powerful graphics engines to achieve an immersive effect: The virtual environment becomes a primary reality for the duration of the game – similar to a dream. Open world games such as “Red Dead Redemption 2” and “Death Stranding” create such a believable illusory world that they make you forget the real world around you as your mind shifts completely over to the Western era or the post-apocalyptic future for a while. But the user cannot really act according to free will and self-determination in this environment since the limits are (still) set by the technology and the programmers. All the same, there is no reason why more comprehensive simulations will not be possible in the distant future. Now that Google has celebrated its first success with a quantum computer, self-learning software and sufficient computing power should not

be limiting factors going forward. The revolutionary computer was able to solve a mathematical problem in three minutes and 20 seconds, whereas the latest supercomputers would have taken an estimated 10,000 years to solve it.

AUTONOMY, HETERONOMY, AND DIGITAL DETERMINATION

Even if we were to dismiss the simulation hypothesis as untenable, it is worth examining how our identity and our desire for autonomy factor into the digital age. Professor Stephan Humer from the Fresenius University of Applied Sciences in Berlin says that certain issues need to be clarified in this regard. According to the Internet sociologist, very few people are aware that, as we casually surf our way through the digital world, we not only reveal our address and shopping preferences, but also directly influence our individual identity. “Our own identity is more influenced by the



Self-optimization: The way we see it, we are all competing for success and recognition. So, we invest time and money to push the boundaries of our personality. But we end up using the same nutrition guides, fitness apps, and success training courses that everyone else does.

digitalization of our society than many people would like it to be,” says Humer. Although we feel free in digital space – often even freer than in our analog existence – we tend to repress the limitations that digital life imposes. In the end, people online are subject to the influence of the state and the economy, laws, rules, and technical and economic framework conditions, just as they are in analog life. Moreover, we are extending our identity through our actions in digital space. Identity has always been an interplay between inner self-determination and external control. Now, a third determining factor is being added to this interplay: our digital personality. People are not necessarily the same on the Internet as they are in the analog world. This has many advantages – and also disadvantages. In a social network or chat, it is quite easy to trick another user into believing we are someone else, or even a real person who doesn’t actually exist. And because it is so easy, it is tempting to upgrade and alter our online identity by adding a few details here and there. For example, people looking for dates online will generally display an alias, some sugarcoated information, and an enhanced profile picture. In chats, it is technically possible for a woman to impersonate a man, or vice versa, without the digital conversation partner ever finding out. While we may think of these new possibilities for self-staging as an opportunity to freely explore our own identity, the Internet sociologist reminds us that we can of course be deceived by other users in the same way. If you distort reality and the gap between the analog reality and your digital identity is too wide, a conflict can arise when you meet your online date in person, for example. “Digital identity is not a purely psychological matter. It has deeper sociological implications. We are social beings that constantly exert an effect on each other,” says Humer. We are not only the person in front of the screen, but also the various virtual aliases who trade on eBay, search for partners on Tinder, and participate in discussions on Twitter. These days, you have to be able to use your imagination in order to develop an awareness of your own identity. This is because the digital part of our personality is largely detached from our body in

terms of both time and space. Stranger still, it only exists virtually in our imagination and in the imaginations of other digital personalities. Nor are zeros and ones enough on their own to represent our identity as a whole – we are more than just the sum of information fragments. And yet our overall identity is a product of all our analog and digital attributes. This only increases the complexity of the interplay of experiences and influences that shape our identity.

DEEPPAKES: A NEW TREND

We therefore need to be fully alert in order to lead a self-determined life in the digital age. This is because we constantly have to recognize and evaluate what is real and what is fake in the digital world. And it is getting more and more difficult. For example, according to research by the Washington Post, the microblogging site Twitter is said to have deleted around 70 million fake accounts in 2018 alone. The anonymous accounts were spreading political propaganda, spam, and disinformation. For comparison: 126 million accounts are active on Twitter every day. On the social media platform Instagram, there are believed to be up to 95 million active bots that artificially “like” posts, which boosts their rankings in search hits and trends. Creating and trading these bots is a legal and widespread service. More recently, deepfakes have been causing a stir and appear to be the next step up from fake news. Deepfakes are videos that have been drastically manipulated via an app. People’s faces and bodies can be swapped, they can be made to say things they never said, and their bodies can be made to do things they have never done. It can be fun on the one hand, but at the same time, it is a massive and frightening attack on the identity of the individual being manipulated. YouTube videos of prominent figures such as Barack Obama, Hilary Clinton, and Arnold Schwarzenegger show how easy it is to make it appear as if people are saying certain things or to place them as individuals in a completely different context. The fact that statements can be falsified in written works has probably been known since writing was invented. The same goes for pho-

SELFIES ARE NORMAL IN THE AGE OF INSTAGRAM, FACEBOOK, AND TWITTER. BUT ISN'T IT STRANGE THAT WE ALLOW OURSELVES TO BE EVALUATED BY PEOPLE WE DON'T EVEN KNOW? IS THIS SELF-STAGING HEALTHY AT ALL?





Self-discovery: It begins with the first steps in life, then undergoes a transformation during puberty in a process through which people seek to define themselves in their unique qualities and goals.

tos, which can be faked for disinformation purposes. Until now, video and audio files have been thought of as nearly impossible to tamper with, and therefore a solid source of evidence. Deepfakes are now calling that into question. Even though the quality of these manipulated videos is still very inconsistent, it is becoming harder and harder to expose them as fakes. So seems that, in the digital world, we won't be able to believe our eyes and ears from now on. Deepfakes are therefore not only a danger to our freedom of opinion, since we can no longer trust what we see or hear, but they also significantly erode any control we still have over our own digital personality. Our digital self can even be completely hijacked by cybercriminals. For instance, if they use our profile to scam buyers on eBay, it is our digital identity that suffers the consequences of the loss of trust. The struggle for our identity in the digital age might be put to another test in 2020. That is when "Facebook Horizon" goes online, a candy-colored, social virtual reality world (see photo on pages 10–11). At first glance, Facebook Horizon is just another animation-based online community where the sun is always shining and the weather is

fine. The virtual reality headset and gesture controls allow millions of users to interact simultaneously and create an environment similar to an amusement park. Facebook CEO Mark Zuckerberg called the platform "another step towards building a social infrastructure that we believe will be important."

THE SECOND REALITY

There is talk of a "second reality" that will provide immersive social experiences. "The hardware has to be out of the way so that the software can take center stage," says Zuckerberg. It is unclear whether Facebook Horizon will be an additional part of the Facebook platform or completely separate. It is quite conceivable that Facebook Horizon users will not just communicate, flirt, and play. Businesses could also open virtual branches and service centers in this second reality and be available around the clock, staffed by personal avatars controlled by either real people or artificial intelligence. According to Statista, Facebook has around 2.45 billion active users worldwide at the end of 2019, and the trend is rising.

THE IMPORTANCE OF DIGITAL COMPETENCE

This is around one third of the world's population. Much of these people's lives could soon be taking place in a new digital cosmos and their digital identity may acquire a greater significance for their own selves. The theory that our universe is merely a simulation suddenly no longer sounds so absurd. But how can we develop and protect our identity in an autonomous way? "People are different when they're digital. But they shouldn't let themselves be forced into being a certain way. They should decide for themselves how they want to be as much as possible," says Internet sociologist Stephan Humer. Lifelong learning, especially the acquisition of digital

competence, plays a key role. Not everyone has to have programming skills, but we should all be aware of how our digital identity is becoming increasingly important for our self-determination and personal freedom. It is now a regular part of life to handle security tools such as passwords, PINs, and TANs with confidence, to protect personal data, and to know and demand your civil and consumer rights. It may not always be easy, but it should be worth our effort – for our own sake. 

NOT ONLY HAS ARTIFICIAL
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Forgetting ourselves: Our personality is shaped over a lifetime. Only when we start forgetting what makes us different do we lose ourselves.



Father Clemens Kascholke SJ (Society of Jesus) is the Director of Vocational Pastoral Care and the key contact for aspiring Jesuit novices. The secondary school German and religion teacher also runs the future workshop SJ in Frankfurt, Germany.

“Without the call of God, I would never have accepted this way of life. Never.”



“It was a calling”

SHOULD I TAKE THE JOB? DO I WANT CHILDREN? WHAT MAKES ME HAPPY? THESE ARE CHALLENGING LIFE QUESTIONS. IN THE FUTURE WORKSHOP OF THE SOCIETY OF JESUS, FATHER PATER CLEMENS KASCHOLKE HELPS YOUNG PEOPLE FIND THEIR SELF-DETERMINED WAY IN LIFE.

Father Kascholke, when did you know it was your destiny to become a priest?

For a long time, it wasn't even an issue. My family is Catholic and I was also a senior altar server. But people would half-jokingly say things like "Clemens is going to become a priest," and that made me wonder. I was fascinated by theology as a science, so that's what I studied. But did I want to become a priest? I had no idea. It wasn't until I got to know Jesuits and their open-minded spirituality that I thought, that's a good way for someone like me, a devout Catholic in the 21st century, to live.

Were you sure that you were doing the right thing?

The decision to join the order is absolute – it affects your entire life. In that sense, a religious order is not the same as a company, which also has a corporate identity that people are supposed to identify with. But after work, you go home and enjoy your private life. I wanted to try it, so I became a novice in 2011. The training is called *Formatio*. It allows both novices and orders to see whether they fit in to this framework, this way of life prescribed by the order. It is an intense process of self-examination and inner confrontation, and still is.

You give up a lot of personal freedom by joining the order, don't you?

Of course, I had to align myself with the three vows of personal poverty, unmarried chastity, and obedience. And not just in the simplest terms of "no money, no sex, no ego." Instead, I asked myself: Do these restrictions lead me to greater freedom? I couldn't justify this way of life for myself based on pure logic. It was a calling. When

in doubt, I have always looked to God and asked: Do you really want me to follow this path? Without the call of God, I would never have accepted this way of life. Never.

Why do young adults attend the future workshop?

Their main question is: "How do I map out a meaningful life?" Many are unable to decide on a path due to the sheer number of possibilities. They don't want to miss out on any opportunities by making a choice. We help our guests to make decisions based on a self-determined, positive attitude. In doing so, it helps to acknowledge that our life is not entirely in our own hands, and that it will always be fragmentary, whatever I decide. Perfection is something only God can give.

How can that work in practical terms?

It's like in the *Formatio*: First you have to know yourself, face up to the positive and negative sides of your personality, and find your strengths and limits – under God's watchful eye. We offer a place of retreat where it can all happen. A person who wants to choose a new path in life needs a period of silence and tranquility, with nothing to distract them. It could take a weekend or it could take a year. It may seem like navel-gazing, but new horizons only open up when you retreat into yourself. Self-determination also requires reflection and communication with others. I get help from my fellow brothers, with whom I share many of my thoughts. The close friendships I have outside of the order are also incredibly important; they allow me to gain new perspectives through conversations. In the end, others often see us differently and more clearly than we do ourselves. ☑

“Does it have to be that brand?”

OUR HOME REFLECTS OUR IDENTITY IN TWO WAYS: AS A PRIVATE PLACE OF RETREAT, IT GIVES US THE FREEDOM TO BE OURSELVES. AS A SHOWROOM, IT PRESENTS THE IMAGE WE HAVE OF OURSELVES TO OTHERS. INTERIOR ARCHITECT **SUSANNE VOLKENS** BRINGS BOTH OF THEM TOGETHER.

Ms. Volkens, give us your spiel: Why would we need an interior architect?

People should be able to be themselves at home, and their home should reflect their personality. That's what I help them achieve. But there's more to it than just buying a beautiful sofa and matching curtains. Good interior architecture is a holistic, complex interplay of colors, shapes, surfaces, materials, light, and room structure. The apartment or house becomes a living space individually tailored to the customer. Our home is the most important and perhaps the last place to which we can still retreat, where we recharge our batteries for work, and recover from the stress of the outside world. It is important to be able to arrange this place the way we want and need it to be for ourselves. On the other hand, we are social beings who like to present ourselves to other people – friends, the boss, the neighbors. We do this with our clothes, our cars, and also our homes.

Do your customers know what they want?

What they all have in common is that they lead very individual lives and want to define and differentiate themselves through their homes. Some are interested in design and know quite a bit about the latest trends and brands, but they hire me as a specialist to add that stylish, professional finishing touch, so to speak. Others are uncertain and overwhelmed. They like a lot of things, but they don't know what works with what. In those cases, I can decide for myself how the rooms will be divided and what to use in terms of furniture and colors. A lot of people come to me because they really don't feel at ease in their own homes. They are often starting a new phase in life – the kids have moved out or a marriage has ended. Then I get involved and we figure out how we could change the home to fit their new life.

How do you figure out what the customer needs to feel well in their home?

It takes a lengthy, personal planning process with many discussions. Empathy is important. I often become like a member of the family for a while, or a good friend. Sometimes we grow so close that it's hard to let go of each other again after the project is over. After all, the customer talks about very personal matters. I see their most intimate spaces, open all the closets, go into the bathroom and the bedroom. We talk about their desires and what needs to change. But I know how the project is going to work out. The rooms are often used for the wrong purpose and tend to be cluttered. There is a lack of quiet spaces and everyday functionality. So we restructure the rooms in a completely different way. Transforming the living room into a kitchen is a radical idea most people wouldn't come up with on their own. But in order to sustainably improve lifestyle and quality of life, sometimes walls have to come down before the right structures can be built.

What is luxury for you and your customers?

Luxury is being able to organize and live your life freely as an individual. If the work I do is exactly suited to a given person or family, it is perfect and not interchangeable. It becomes totally exclusive. Many customers only think at first in terms of brands. But the label on the product is actually not important. The concept has to be right, the idea of what works best for the customer. Which products we use to get there is a secondary consideration. Does it have to be that brand? All right, then it will be that brand. But I do try to get people to say, “This is about me, not an image!” Then the kitchen, bed, and chairs are made by a carpenter – not some “big” name. In terms of individualism and self-realization, it doesn't get much better than that. 

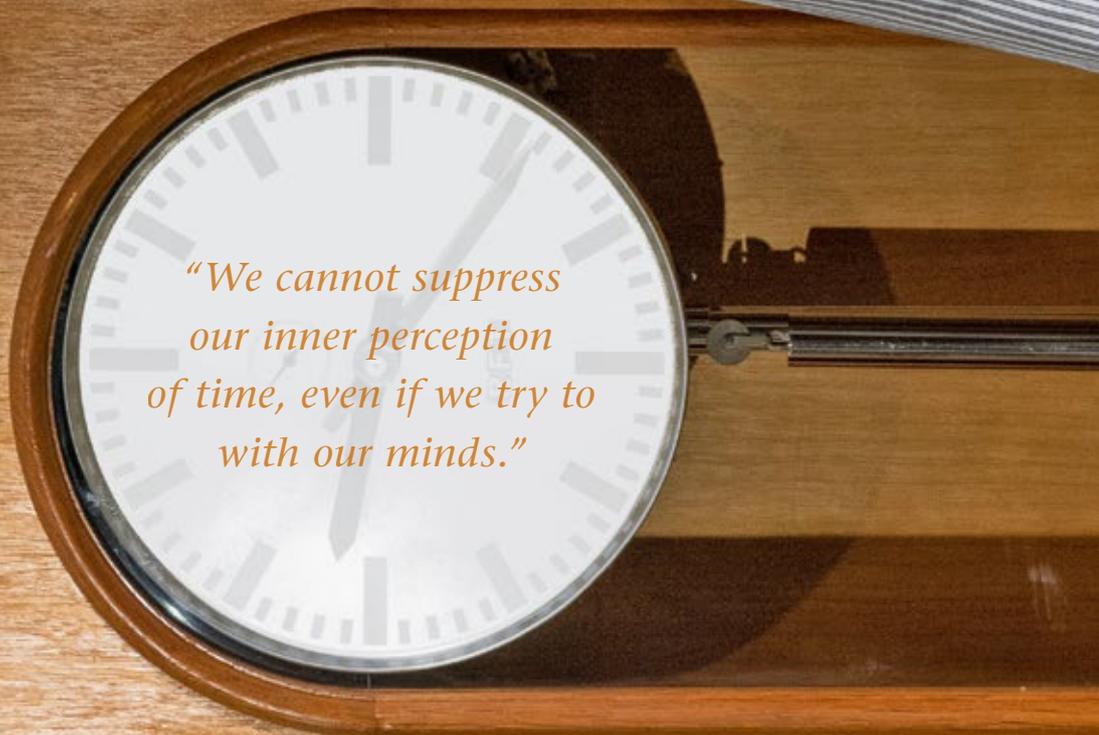
A woman with short brown hair, wearing a black turtleneck, blue jeans, and black boots, stands leaning against a white pillar in a modern, empty room. The room features large windows with a view of a city and water, and a ceiling with recessed lights. The floor is marked with blue lines.

“Luxury is being able to organize and live your life freely as an individual.”

Susanne Volkens runs the interior architecture firm Volkens & Wiese together with Petra Wiese. Based in Cologne and Cape Town, the duo plans and executes exclusive, individually tailored interior design projects for properties all over the world.



Swiss historian Professor Eduard C. Saluz has been the Director of the German Clock Museum in Furtwangen in the Black Forest since 2003. The museum is part of Furtwangen University. In addition to technical history and clock-making, the museum also explores the constantly changing way we view time.



"We cannot suppress our inner perception of time, even if we try to with our minds."

“We’re doing it wrong”

HUMANS BELIEVED THEY HAD GAINED CONTROL OVER TIME WHEN THE CLOCK WAS INVENTED. BUT THE CLOCK ONLY SHOWS A PERCEPTION OF TIME, SAYS **PROFESSOR EDUARD SALUZ**, DIRECTOR OF THE GERMAN CLOCK MUSEUM. THERE IS ANOTHER, NATURAL TIME THAT REGULATES OUR LIVES.

Professor Saluz, the Meridian Conference took place in Washington 135 years ago, after which the earth was divided into 24 time zones. Why was that necessary?

Up until then, the world was a patchwork of different local times – it was temporal chaos. But as technical developments advanced, time had to be synchronized. People began connecting to each other more and more between cities, by telegraph and rail. Without standard time, it would be impossible to organize a networked train schedule, for example. There were serious accidents in the USA due to trains being sent onto what was supposed to be an unoccupied track at the same time. Then, the railway companies quickly introduced a standard railway time. Since sea charts were also being standardized around the world, the global time zone system followed, based on the zero meridian in Greenwich near London. Today, most countries use Coordinated Universal Time as a time standard.

The time zone system isn’t mandatory?

Not at all. It’s true that a lot of things would be easier if everyone were to adhere strictly to the system. But luckily our world is culturally diverse. For instance, China spans across five time zones but only uses the one in Beijing. The country draws its greatness and identity from a centralization of power in one place, which is the capital. Even time has to be regulated according to that place. It’s a sign that shows everyone: whoever decides what time it is holds the power.

Doesn’t all that clash with our internal clock?

We distanced ourselves from our natural perception of time long ago. We notice this most of all when we switch to and from daylight saving time or when we have jet lag. But our body still reacts

to the sunrise, to morning, noon, and night. We cannot suppress our perception of time, even if we try to with our minds. It’s unhealthy to live in constant conflict with our internal clock.

Should we take a more sensible approach to time?

Yes, we should. There is a clock in the museum from the Black Forest from around 1860. It has an image of a boy coming home from school. He is showing his slate to his grandmother and little sister. Written on it in English are the words “Time is money.” Capitalism teaches us that time can be transformed into money with the division of labor, automation, and digitalization. Today, billions are traded within microseconds at the stock exchange. The more we fragment time, the more money we can make. But we generally don’t make more time for ourselves.

What do you personally find fascinating about clocks?

I think they’re incredible. From a subjective point of view, time does not pass in a steady manner at all. And then we suddenly develop this abstract idea of steadily passing time and make it tangible with a complex device, the clock. This is how people freed themselves from natural time. It was an almost godlike act of creation and a defining moment marking our entry into the modern era. This machine even shows us that the course of the sun isn’t consistent. We have a very old clock in the exhibition that shows both the irregular time of the sundial and the regular time. The sundial was abandoned entirely around 1750. Paris clockmakers boldly claimed that the sun was lying about the time. Man felt superior to nature. Even now, this is basically how we think about time, whereas in fact we’re the ones getting it wrong. ☑

Agriculture feeds people. But while small-scale farmers in developing countries are fighting against hunger in their regions, high-tech industrial agriculture is serving a totally saturated market. A market in which a third of all food ends up in the trash, according to the EU. Low prices are the main reason behind this waste in over 50 percent of consumer cases. On the one hand, meager rations of maize porridge ensure survival, but on the other hand, around one third of pork production goes to waste. It is a fallacy that the modern agricultural system in wealthy nations serves to fight world hunger. Only a minute fraction of the food produced in those countries is of any benefit to populations in crisis. Were it not for these wasteful consumption patterns, the agricultural system could feed around 12 billion people. But according to UN estimates, 821 million of the nearly 7.7 billion people on our planet are suffering from hunger.

DOPING FOR GROWTH

It is clear that farmers in developing countries also benefit from the accomplishments of modern agriculture. For example, they can use discarded production machines or special seeds, such as hybrid maize. However, these seeds can also cause problems. The selectively bred plants produce a higher yield, but they also draw more nutrients out of the ground at the same time. Chemical fertilizer helps, but it also costs money. Many small-scale farms rely on traditional solutions that they trust and are less expensive. These methods are used to grow maize, beans, and peanuts. The crop residues stay on the ground, return to the soil, and maintain its fertility. UN organizations report that the yield in some areas increased by one fifth, even without the use of chemicals. Despite this success, the number of modern farming operations is on the rise in Africa and Asia, where more than two thirds of all starving people live. Chemical fer-

tilizers and large-scale monocultures are gaining ground. So are the pesticides and herbicides that go along with them. This development began back in the 1950s and 1960s in the industrialized countries. Combined with the specialization of farming operations and technical progress, it enabled food to be produced in ever greater quantities. At the same time, it is the reason why agriculture is directly and indirectly responsible for 40 percent of the world's greenhouse gas emissions, which result from production, processing, transport, consumption, and waste disposal. The excess supply drives prices down and leads to changes in consumer behavior. In many parts of the world, food is no longer a means to an end. It is a product that is continually losing value on the global market. In order to stay competitive, farmers try to increase their production while lowering the additional costs. Overbred monocultures and mass livestock farming are ideal from a technical point of view. But they cannot work without chemical fertilizers, pesticides, and herbicides. Modern agriculture is caught up in a vicious circle that it can no longer break out of – and the consequences are horrific. Overgrazing, over-fertilization, and monocultures destroy fertile soil. Estimates from the German Federal Environment Agency claim around 10 million hectares are lost worldwide every year. Rainforests are cleared to cultivate soy, which is processed into concentrated feed and used as the basis for animal fattening. It is a practice that demonstrates the reckless exploitation of our planet like no other.

DESTROYED FOUNDATION

In the short term, modern agriculture can and has helped feed many parts of the world. But in the long term, it promotes climate change and destroys its most important foundation: the soil. Different ways of thinking and sustainable solutions are needed so that the earth can continue to feed all its inhabitants well into the future. **□**

In addition to soy, massive palm oil plantations are also cultivated on cleared rainforest areas. Palm oil is a highly versatile product.

Groundbreaking

TREES ARE GOOD FOR THE CLIMATE, WHICH IS WHY PLANTING CAMPAIGNS ARE BEING PROMOTED. WHILE THE FOREST HAS A QUITE STRONG LOBBY, THE GROUND EKES OUT A SHADOWY EXISTENCE. THE POTENTIAL FOR CLIMATE PROTECTION AND SUSTAINABLE AGRICULTURE IS HUGE.

High summer in the Serengeti. A dusty plain with no end, a desert-like, dead landscape. That's how it looks on the surface. But the soil beneath surface is teeming with life: billions of microorganisms, plant roots, and organic residues. With the onset of the rainy season, this subterranean cosmos also reveals itself to the superficial observer as the Serengeti bursts forth with greenery. Within just a few days, the dusty landscape transforms into a sea of grasses that provide a seemingly inexhaustible source of food for countless grazing animals in Africa during the winter and spring months. Unlike the other plants, the growth of the grasses is activated whenever animals bite them. This perfect co-evolution is how the grasslands grew into the Earth's largest biome. The Serengeti then gradually changes back into a barren landscape until the next rainy season. The herds move on, leaving their dung behind with withered plants on the ground, in which the lush roots of the grasses and plants partially decompose. It is exceptionally fertile and extremely



LARGEST STORAGE

The Earth's biggest natural CO₂ sink is the atmosphere. It stores around half of the world's CO₂.

DISSOLVED STORAGE

Around a quarter of the CO₂ disappears in the oceans. Physicochemical processes cause it to dissolve into the water, producing carbonic acid. The higher the CO₂ emissions, the higher the acidity of the oceans. The altered pH value of the waters has a negative impact on marine organisms. For instance, it affects the growth of corals and phytoplankton, which are the starting point of marine food chains and also of vital importance to humans. This is because the main component of plankton are species of diatoms, which produce well over half of the oxygen in our atmosphere.

ABOVE-GROUND STORAGE

Another quarter of the world's CO₂ reserves are absorbed by terrestrial ecosystems. This mainly involves plants, especially trees. Using light and water, they convert CO₂ into sugar, release oxygen, and store carbon through a process called photosynthesis. Trees store most of the carbon in their trunks. Some of it is also stored under the

50% Grassland soils can store up to 50 percent more carbon than forest soils.

beneficial for the climate. This is because the mass of organic residues is also causing the soil to store a lot of carbon.

HIGH STORAGE CAPACITY

“At least three times as much carbon can be stored under the ground than above the ground,” said Professor Ingrid Kögel-Knabner at the presentation of the 2019 German environmental award, which she received for her research on the storage of carbon in soil. It requires a high proportion of organic matter, the humus. But while CO₂ emissions are rising steadily – from just under 10 trillion tons to nearly 40 trillion tons in the past 60 years – humus soils are being lost. Natural, closed ecosystems like those in the Serengeti are growing scarcer. Intensive

farming and soil sealing account for the loss of around half of the humus soils. Slash-and-burn agriculture in rainforests is also a serious issue in many respects. An area the size of England was destroyed in 2018. The fire destroyed not only the Earth’s most important above-ground carbon reservoirs, but at the same time released the carbon stored in the trees as CO₂. The falling ashes are fertile and enrich the now exposed, nutrient-poor soils, which can nevertheless only be cultivated for a short time. Only barren soils remain after the clearing, and these are susceptible to erosion and useless as carbon stores. Less evident is the fact that fertile soils across the globe have been undergoing destruction for decades at a similar rate. Failure to rotate crops, the use of chemical fertilizers and pesticides, deep plow-

ing, and overgrazing are all factors that damage the soil microbial biomass. It loses its fertility and capacity to store water, leading to erosion. Intensive livestock or crop farming also has an impact. While artificial fertilizer is spread onto the fields, the livestock farms produce liquid manure that hardly anyone wants and end up transporting it to other regions. This “manure tourism” and the resulting over-fertilization pollute the soil and increase nitrate levels in the groundwater. “It’s not just up to farmers to protect the climate. But if, rather than exploiting the land, they regard themselves as landscape gardeners, they will automatically contribute to the well-being of the atmosphere,” says Dr. Anita Idel, a lead author of the UN global agriculture report. 



ground in the roots. The more untouched the forest, the higher the storage capacity of the entire ecosystem. Old, rotted wood is preserved and ultimately reaches the soil, allowing it to store even more carbon. But a forest can store much less underground than it can above ground.



UNDERGROUND STORAGE

Carbon storage in grasslands works in nearly the opposite way to a forest. The relatively small plants store comparatively less carbon on their surfaces. But while the root-shoot ratio for trees is 2 to 1, it is at least the other way around for grasses. With sustainable grazing or mowing, the dense root networks transfer a large amount of carbon into the soil, which supports the organic matter in the earth. “The roots of today are the humus of tomorrow,” says Idel. “The most fertile soils in the world, such as in Manchuria, the prairies of North America, and the Pampas of South America, are previously grazed steppe soils.” Another positive aspect of the grasslands is that the plants grow quickly and spread everywhere. This means that barren areas can be converted into fertile pastureland within a short time – much faster than in a forest. New humus soils are formed and the carbon storage capacity of the soil is increased.

Growing production

OUR PLANET PROVIDES US WITH AN ASTOUNDINGLY DIVERSE RANGE OF FOODS. BUT CERTAIN AGRICULTURAL GOODS SERVE AS THE CORNERSTONES OF OUR FOOD SUPPLY. HERE IS AN OVERVIEW OF GLOBAL PRODUCTION.

Nearly 38 percent of the world's land area is used for agriculture. Although meat consumption has increased almost fivefold in the past 50 years – from 70 million to over 330 million tons – vegetable and cereal crops are still the foundation of global nutrition. Sugar cane is by far the most produced food commodity. Sugar is extracted from the plant, which is also used as animal feed and fuel. It comes as no surprise that China is the world's leading food producer. The country produces around two thirds of the most common agricultural goods, putting it in the lead. As the most populous and fourth largest country on Earth, it covers a large area and has a high demand for food. Export figures also reflect this. A small country like Germany exports around a third of its agricultural goods and ranks third in the world, while China ranks fifth on this list. 📌

No other country makes as much money from agricultural exports as the USA at around 120 billion euros – a market share of just under 10 percent. Of the 20 most produced foods in the world, the country is a top producer of maize (2nd place), cow's milk (5th place), and soybeans (7th place). The USA is also the biggest importer of agricultural goods.



Brazil is by far the biggest net exporter of agricultural goods in the world. With a market share of six percent, it is the fourth biggest exporter, but it imports so little that the trade surplus was nearly 53 million euros in 2016. Looking at the world's 20 most produced foods, Brazil is a leading producer of sugar cane (1st place) and chicken meat (18th place).

85% > 60%

Eighty-five percent of the world's farms cultivate less than two hectares. Together they account for around 60 percent of the world's arable land.

The counterpart to sugar cane in the southern hemisphere is the sugar beet in northern latitudes. It is the eighth most-widely produced agricultural product in the world. Barley ranks 12th in this list. Russia is a leading international producer of both these plants.



The most populous country in Africa produces more cassava than any other country. The root of this plant, largely unknown in the northern hemisphere, is a staple food in many regions and the ninth most-produced food in the world.

In terms of the world's 20 most produced foods, India is a leading producer of buffalo milk (13th place) and bananas (16th place). It comes in second after China for wheat (3rd place) and rice (4th place).

It is remarkable how China's economic power is reflected in its agricultural production. The country ranks first in eight of the 20 most-produced agricultural products in the world: Wheat (3rd place), rice (4th place), potatoes (6th place), tomatoes (10th place), pork (14th place), watermelons (15th place), sweet potatoes (17th place), and onions (19th place). In addition, the 1.4 billion inhabitants are top producers of many other agricultural goods such as apples, kiwis, rabbit meat, tea, and walnuts.



Two worlds in harmony

THE BUZZWORDS INTERCROPPING AND BIODIVERSITY ARE IMPORTANT CONCEPTS IN SUSTAINABLE AGRICULTURE. BIOLOGICAL AND DIGITAL ASSISTANTS ARE ONE OF THE KEYS TO PRODUCTIVE FARMING AND MAINTAINING SOIL FERTILITY AND BIODIVERSITY.



Rotating crops in the fields, cultivating robust varieties, gently tilling the soil with plow, harrow, and hoe – these are all tried-and-true practices that have been implemented in arable farming for centuries. But they are of little interest in conventional agriculture. After all, it did exceedingly well with the support of products from the chemical industry. But none of this adds up anymore. The loss of fertile soils is just one of the problems. Flora and fauna are adaptable and have developed resistance in some cases. As a result, farmers are now battling superweeds like *Alopecurus myosuroides*. Genetic mutations caused by herbicides have made some species immune to the chemical weapons. While the non-resistant species are destroyed by herbicides, the mutant type spreads rapidly, causing severe crop failures. There is no chemical solution in sight. Industrial agricul-

ture is being attacked by pests that it either created itself or allowed to proliferate.

AUTONOMOUS SWARMS

Camera-controlled cultivators may help combat superweeds. Equipped with GPS and lane-keeping assist, they target weeds and pull them carefully from the ground. By contrast, agricultural machinery manufacturer Fendt's Xaver project may offer a different approach. The system is based on a swarm of small, autonomous robots that cultivate the fields. Until now, research has been limited to seeding robots that work independently from a logistics machine, consume little energy, and do not compress the soil. It is conceivable that such autonomous swarms could be deployed for various tasks in the future. For example, they could pull out weeds with great precision. Or they could remove companion plants before

Digitalization provides farmers with a wealth of data. Growth rates, irrigation, parasite infestation, and nutrient content are just a few examples. However, data protection is often inadequate.

The Xaver project could revolutionize agriculture. Instead of big machines, small, autonomous robots take over the work in the fields.

38% Almost 38 percent of the world's land area is used for agriculture.

the harvest and leave them on the ground. This would allow farmers to grow suitable companion plants at the same time in order to maintain or increase soil fertility. But superweeds are not the only problem – there are also animal pests that cause significant crop losses. A little moth is sowing fear on cornfields around the world. Big monocrop plantations are the perfect place for the European corn borer to lay its eggs. After hatching, the larvae bore right through the plants. But instead of pesticides, some farmers are turn-

ing to an unusual setup. At the first sign of corn borers, they launch drones that release *Trichogramma* wasps, the moth's natural enemy. The wasps deposit their own eggs inside the eggs of the corn borer. Then, wasps hatch in place of the voracious larvae and immediately begin looking for more host eggs to lay their eggs in. This digital/biological duo has already proven to be an effective control agent. Overall, digitalization has played a major role in agriculture for many years. Satellites that provide information

on the fertilization level of the soil, allowing fertilizing machines to be precisely programmed with the acquired data, are commonplace in the industry. So are sensors that deliver a wealth of relevant information about plants, animals, or other fields. The future of agriculture will depend much more on how these data and new technologies are implemented. Instead of further intensifying agriculture, the key should be to establish sustainable farming practices with high yields. ☑



These swarms of helpers are controlled via satellites. All the farmer has to do is manage them.

Veterinarian and mediator Dr. Anita Idel was a lead author of the global agricultural report. She teaches at universities and is the author of the book “Die Kuh ist kein Klima-Killer” (“The cow is not a climate killer: how the agricultural industry is ravaging the Earth and what we can do about it”). Her focus is on the untapped potential of sustainable grazing for soil fertility, climate, and biodiversity.





Wrong conclusions

VETERINARIAN DR. ANITA IDEL ALSO STUDIED AGRICULTURE AND BELIEVES THAT THE MAINSTREAM THINKING IN RESEARCH AND EDUCATION IS DISASTROUS. SHE IS CALLING FOR A RADICAL CHANGE IN THINKING WITH THE AIM OF GENERATING SOIL FERTILITY IN ORDER TO FEED THE FUTURE POPULATION.

Ms. Idel, is agriculture well equipped for the future?

Not if we go on this way. We have imposed a capitalist system onto living, finite resources. Animals, plants, and soils are being exploited and destroyed instead of used for their symbiotic potential. There is a great risk in doing so, initially for farmers and ultimately for every national economy. We experts are well trained in repairing, which is all that's being done. But we are only able to delay the destruction of previously fertile soils at best rather than avert it.

But the yields are constantly increasing.

That's true, but studies claiming that organic farming is not the solution due to lower yields are comparing apples and oranges. If you compare a field of organic corn with industrial cultivation, the yield of one growing season is indeed lower. But the consequences are completely left out of the equation. As a result of mineral fertilizer and pesticide use in the USA, millions of hectares of arable land have been taken over by resistant weeds. The loss of these areas never appears in any yield statistics. Studies designed in this way are highly unscientific because they externalize the costs of the damage, yet promise productivity and growth...

Why is that?

There's more money in it than in farming! Since the 1970s, the message propagated by leading agricultural economists was that high-tech, synthetic chemical fertilizers and pesticides, along with genetic engineering and biotechnology, can be used to maximize the production of animals and plants without limits. This is why, according

to the world agricultural report, disaster is looming not despite of but rather because of mainstream thinking in science and teaching. If the study design is flawed, the math may be right but the conclusions will still be wrong. The idea now is to move the cow, branded as a climate killer, off the pasture and give it more concentrated feed so that it emits less methane.

What needs to be done instead?

A systemic research approach would include the impact of concentrated animal feeding operations on the environment and the climate. The cow is a ruminant. It shouldn't be turned into something that competes for our food when it can protect the climate by being on pasture. We need sustainable agriculture. All the efforts going into research, education, and practice must be devoted to our basic resource: Agriculture will only have a future if we maintain soil life and, moreover, restore fertility to the soils.

How should farmers pay for this?

With the many tasks that farmers can, should, and must carry out, the product price is of course not adequate as an income. Biodiverse ecosystems require considerable financial support. There is plenty of money available for this in the EU, for example. But as a result of extreme lobbying, 20 percent of businesses receive 80 percent of the subsidies. And it's not just the way funds are allocated in favor of major investors – regardless of how they farm this land – that destroys livelihoods. There is also the global market and free trade, which aims to produce goods wherever it is cheapest. Only qualified external protection can prevent ecological and social erosion. ☐

The self-driving car is poised for launch. So is the “connected car” – a networked car that is connected to the Internet. Once cars are able to recognize road signs, communicate with other vehicles, or take alternative routes to avoid traffic jams and locate available parking spaces, the possibilities appear endless. The average motor vehicle today generates massive information flows, and we can expect a dramatic increase in data volumes in the future. It is still unclear whether automobile manufacturers are meeting the rigorous data protection requirements in place and how much control the driver has.

MORE TRANSPARENCY IS NEEDED

When it comes to cars, the discussion around data protection raises many issues. A networked motor vehicle can create comprehen-

Driver in the glass car

CARS KNOW MORE ABOUT THEIR DRIVERS THAN THEIR OWN PARTNERS DO, AND PHOTOS AND VIDEOS OF NEW VEHICLES CIRCULATE ON THE INTERNET BEFORE THE MANUFACTURER EVEN HAS A CHANCE TO PRESENT THE VEHICLE. THE GROWTH OF DIGITALIZATION AND NETWORKING HAS CREATED **NEW CHALLENGES** FOR THE AUTOMOTIVE SECTOR. WHAT IS REALLY THE STATUS QUO FROM THE DRIVERS' PERSPECTIVE, AND THAT OF THE MANUFACTURERS?

sive personal profiles like no other product. Cars collect information about the driver's daily routine, trip details, height, and weight via the seat setting, number of passengers, contact lists, and taste in music. They can even analyze the driving style in order to determine emotional states. In the future, automobile manufacturers will also earn money with services that reveal a lot of information about the user. If a car is low on gas, not only will the nearest gas stations be displayed, but also the waiting times. What's more, gas station companies often entice drivers with coupons for car washes or a complimentary coffee to go. Restaurants and hotels have similar incentives. Transparency is needed to cope with these data streams. Automobile manufacturers must provide a list of all collected, processed, stored, and externally transferred data to the public for every model. Furthermore, vehicle owners should also be given the possibility of opting out, which would allow them to deactivate the unnecessary data themselves.

DATA SECURITY FOR AUTOMOBILE MANUFACTURERS

Digitalization hasn't just created problems for vehicle owners. The automotive sector is also fighting for the protection of its own data. "Some manufacturers have been running into problems because photos of cars that have not yet been released are being made available to the public," explains

Benjamin Herzog, Senior Security Consulting at TÜV Rheinland. ISO 27001, the current standard for information security, does not cover the special needs of the sector. This is why the automotive industry created its own testing label TISAX (Trusted Information Security Assessment Exchange) in 2017. Since the TISAX label was introduced, automakers have been requiring the standard from an increasing number of suppliers and service providers that process sensitive data from manufacturers. "Our experience has shown that companies sometimes don't know whether TISAX is relevant to them and, if so, which requirements they need to fulfill. So in addition to the audits, TÜV Rheinland offers assistance in clarifying the requirements with the customer and helping them prepare for TISAX," says Herzog. Every TISAX assessment is based on a catalog of information security requirements. This basic label applies along the entire automobile supply chain and can therefore also be required for media production or call center service providers. Suppliers that work with design data and prototype components must also implement measures to protect prototypes, such as the encryption of operational servers. TISAX labels must be updated every three years by undergoing another assessment. Due to increasing demand, TÜV Rheinland is currently expanding its capacities for TISAX consultations and assessments worldwide and is able to implement them within two to three months instead of the usual six months. 

There has always been a huge lack of transparency regarding the data collected by automobile manufacturers from their customers and drivers.



An aerial photograph showing a group of business professionals walking along a path. The path is flanked by large, dark green shadows of trees, creating a sense of depth and movement. The people are dressed in business attire, and their shadows are cast long and dark on the ground. The overall scene is set against a light, textured background, possibly a paved area or a light-colored ground.

Involve all employees

SUSTAINABILITY IS A DEFINING ISSUE IN OUR WORLD THESE DAYS –
ESPECIALLY FOR COMPANIES. IT IS ABOUT MORE THAN JUST COMPLIANCE
WITH ENVIRONMENTAL REGULATIONS.

Companies that want to operate sustainably and efficiently need to make changes to their management culture. In addition to efficient machines, they need employees who can help shape this transformation.

In today's fast-moving business world, factors such as safe and fair working conditions and environmental awareness are playing an increasingly important role: from the point of view of consumers, business partners, and stakeholders. Beyond its economic purpose, a sustainable company needs to take social aspects into account in order to contribute to the well-being of society. Pressure from buyers and politicians is growing, especially on companies that manufacture consumer goods, but also on the overall economy. Many customers no longer just want to buy cheap goods. They also want to know under which conditions the items are produced, imported, and exported. There are many indications that changes to the law will soon force all companies to operate more sustainably. Doing business sustainably increases the trust of customers, suppliers, and business partners, boosts staff loyalty, and makes companies attractive for employees.

DROPPING OFF AND PICKING UP EMPLOYEES

But how can it be implemented? "In order to become truly sustainable, all employees, from managers to apprentices, must be actively involved," says Thomas Tillmann, specialist in sustainable corporate management at TÜV Rheinland. The implementation strategy should be established at the senior management level and the management itself should set a good example. Sustainable corporate management must be implemented out of conviction and demonstrated in an authentic way. This will allow companies to influence their suppliers and require them to reduce packaging waste, for example. At the same time, the employees' working conditions should be monitored. A company can also exclusively use sustainably grown raw materials. "Another way to support climate neutral production is to use green power from renewable energy sources," says Tillmann. Are any machines on that don't need to be running? Are the lights always on in the parking garage? Are there any additional ways to save water, such as

upgraded systems or biodegradable chemicals? Doing business sustainably means being mindful of our everyday actions. Even small changes can make a difference. Perhaps the company could switch to fair trade organic coffee and every employee could be given a reusable cup in order to cut back on plastic waste. These changes make an immediate, visible difference for every customer and every employee and help increase their awareness of environmental protection and sustainable consumption. Switching on lights with motion detectors, switching off monitors during breaks, minimizing and separating waste – employees can be made aware of measures like these through workshops. "It's important to get employees involved so that they identify with the issue," explains Tillmann. He thinks that sustainability or idea competitions are a great way to do this. For example, companies could offer prizes as incentives for employees to bike to work. Whoever contributes the most towards reducing CO₂ is the winner. Employee health is also an essential part of running a more sustainable organization. In-house fitness programs, yoga at the workplace, or training sessions on creating a better work-life balance are just a few of the many options.

A STANDARD MAKES COMMITMENT MEASURABLE

The ZNU standard "More Sustainable Business" not only gives companies a solid foundation for their commitment, but also serves as a way to benchmark and audit the results. After introducing this standard, which functions as a useful management system, companies can undergo testing and certification so that everyone can see the results of their efforts, internally and externally. The ZNU standard is based on the German CSR guidelines and the 17 Sustainable Development Goals of the United Nations, which range from ending poverty and hunger to health and education to gender equality and sustainable consumption. The standard is open to all industries, is internationally valid, and therefore also ideal for companies with subsidiaries abroad or foreign suppliers. At some point, this way of thinking might be so ingrained in the company that it will become second nature for everyone. ☐



Hand-Crafted Freedom

SHE IS GERMANY'S MOST WELL-KNOWN MAKER: **LAURA KAMPF** TINKERS, BUILDS, DESIGNS, AND HAS TURNED HER PASSION INTO HER OWN BUSINESS. THE STAUNCH YOUTUBER TALKS ABOUT THE DO-IT-YOURSELF TREND AND HER MANUAL FOR HAPPINESS.

Ms. Kampf, what exactly do you do as a maker? Who is part of the steadily growing maker community?

The maker community is basically a group of people who like to change things and get things done. We are “problem solvers” who like to help ourselves and aren’t afraid to break a warranty seal or grab a tool.

How and why did you become a maker? Did you receive training in a craft?

It started while I was studying design. I wanted to find out whether my ideas and concepts were feasible in reality, so I started making prototypes, which was a bit daunting at first. For example, I made a tattoo machine from a milk frother and a two-meter-high cassette recorder. Unfortunately, I never received training in any craft, so I reached the limits of my abilities pretty quickly. But whenever something worked out, I would get really excited. That’s why I stuck with it and kept going. And I learned something new with every project.

What’s a regular working day like for you?

There isn’t much regular about what I do. Since I tackle a new project every week, there are always new challenges. I’m growing and working together with other makers and companies. For instance, this year I cut the roof off a Tesla, built a tankless water heater from scrap, and designed what is probably the world’s loudest bicycle. I drove in a car derby in the desert, and last week I made a very traditional piece of furniture out of wood. What I do is never boring.

Do you see yourself more as an artist or a craftsperson?

That’s a very good question. I think I’m at home somewhere between art, design, and craft. It depends on the project and my mood. Fortunately, I’m impossible to pigeonhole.

More and more people are using their free time to do something practical. They would rather tinker around

*“For me, making things by myself
doesn’t mean I’m trying to save.
It gives me the freedom to build things
the way I want them to be, regardless of
how unconventional that might be.”*

Her workshop is bigger than her apartment. It’s where she comes to life. The Cologne native feels most at ease here, surrounded by boards, her workbench, jigsaw, and cordless screwdriver. On her English-language YouTube channel, the design graduate documents her projects and stays in touch with a continually growing fan base and maker community.



PMP 71
TNT
01 05 74
12 Stück
Brutto: 45 kg

in their spare time instead of watching TV. How do you explain the do-it-yourself trend?

I think people are getting more and more fed up with consumption. The non-stop availability and endless selection of goods is often overwhelming. When I go to a furniture store to buy a table, there are 50 different models to choose from. But none of them are made for me. The table is designed to meet other requirements: Is it cheap to produce? Can it be easily shipped? What's trendy right now? None of that has anything to do with me. For example, I want my dog Smudo to be able to sleep under the table, but I've never seen a dining table with an integrated dog bed in any furniture store. But what I can do is build one myself and live sustainably.

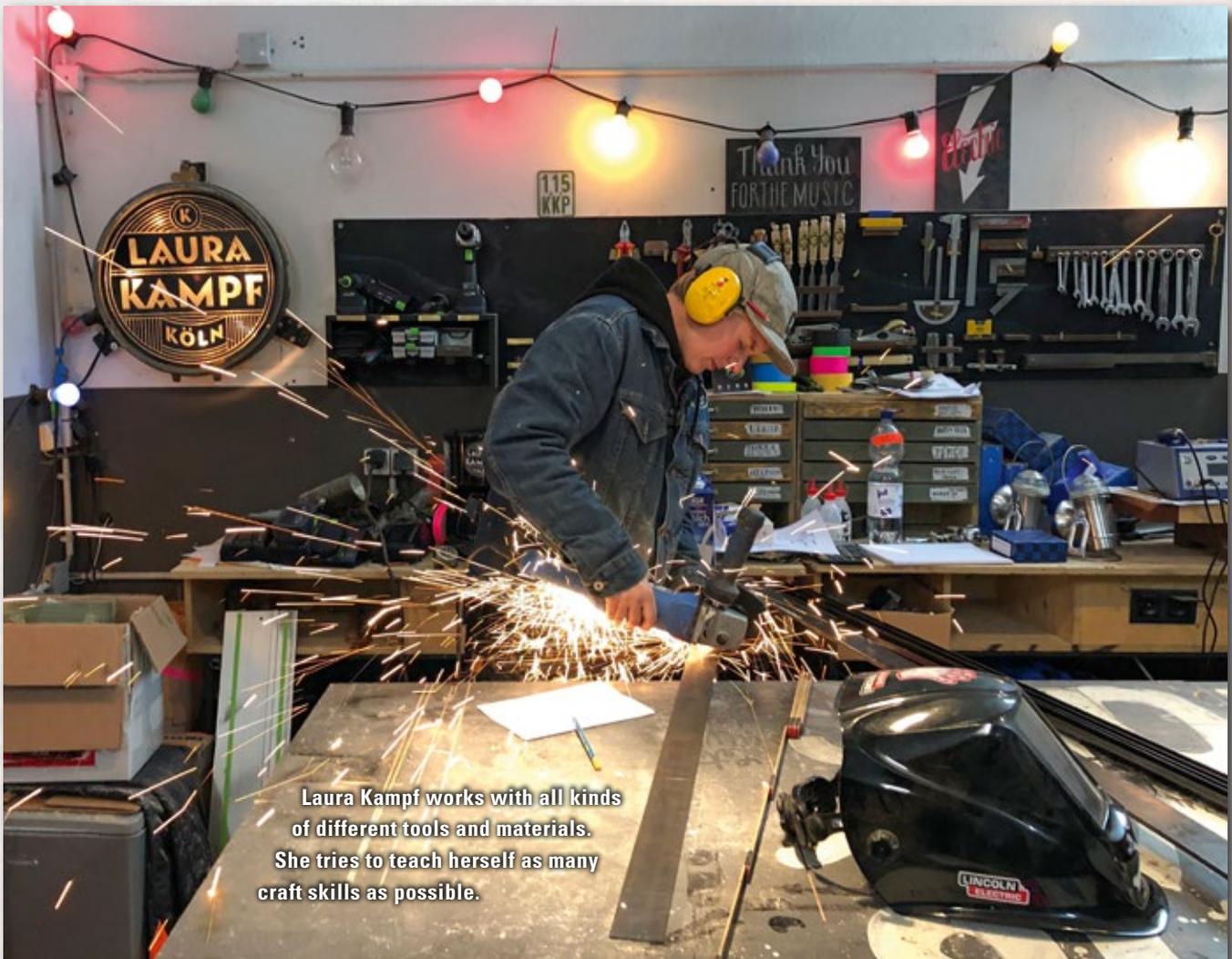
And save resources and money?

Exactly. I think more and more people are dis-

covering that making things yourself doesn't just mean saving money. It's also a way to express yourself, develop your tastes, and help yourself. It also shows that you're living sustainably. Just like we're always questioning where our food comes from, we're also becoming more interested in where our furniture comes from, like the wood for the table I mentioned. Awareness of sustainability is growing. If I build things myself, I get to decide. And if I repair something that's broken, I'm also making an impact because I've decided to fix what's already there instead of buying something new.

You're not just a maker, you're also a busy YouTuber. Do you see yourself as an entertainer or are you also actively trying to get others interested in your passion?

My aim is to use my videos to pass my enthusiasm and love of building things on to other people and inspire them to look at materials, furniture, and



Laura Kampf works with all kinds of different tools and materials. She tries to teach herself as many craft skills as possible.



“Do-it-yourself has the charm of creating something concrete.”

objects in a different way. A chair isn't just a piece of furniture you sit on – it can also be a statement. Maybe it's made of scrap or can seat two people, or it might simply be a bit more tailored to me. All of that is design, and that's what allows you to express yourself. Everyone who likes building, learning, and trying things out can do it.

You've turned your hobby into your job. Is that the ultimate autonomy and freedom? Do you still draw a line between your work and your free time?

The line between my work and my free time is actually quite blurry. If it were up to me, I would stay in my workshop the whole day and build. But because I've made it my job, there are other obligations I have to see to. I collaborate with several companies, travel a lot, and of course there is also a lot of organization and communication involved. But my goal is always to build as much as possible!

These days, we live in an individualized society in which people are increasingly under the illusion that they can live their dreams. What advice would you give to people who have decided to pursue self-determination?

It was very hard for me to find my dream. With all the possibilities and all the occupations out there, it's an enormous undertaking to find the right one. It's important to try things out and stay flexible in your mind. When I was 18, I wanted to become a film editor. But while I was in training,

I noticed that I liked working with the camera a lot more. That's how I got into photography, which in turn is how I came to design. And that's what ultimately got me to building. Now, I film every week and edit my own videos. In the end, my career

path didn't follow a straight line. If I hadn't tried things out, I wouldn't have made so many discoveries. So just do it. Start somewhere and keep going from there with everything new that you've learned. It's better than being paralyzed by indecision over all the possibilities.



Do-it-yourself YouTube channels are gaining popularity and the community meets up at maker fairs. In which direction is the scene headed?

I hope the scene keeps on growing. There can never be enough makers. Maybe at some point building your own furniture won't be a trend anymore, but instead it will just be normal. That would be amazing.

Laura Kampf discovered her passion for crafting while she was studying design.

And what are your personal goals?

I want to continue doing this for a while and see where this journey takes me. But my goal is still to spend as much time as possible in the workshop. In 2020, I'm also going to be in new episodes of the German TV show "Die Sendung mit der Maus" ("The Show with the Mouse") in the "Making Stories" section. My role in the show is to inspire kids and their parents to make their own things. ☑

“If you allow your will constantly to be overborne by another; if you give up your own preferences and inclinations, and become only another’s echo; if you live about as others desire, you will lose more and more, for this existence, the power of self assertion.”

Prentice Mulford, American journalist,
philosopher and writer

ABO

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