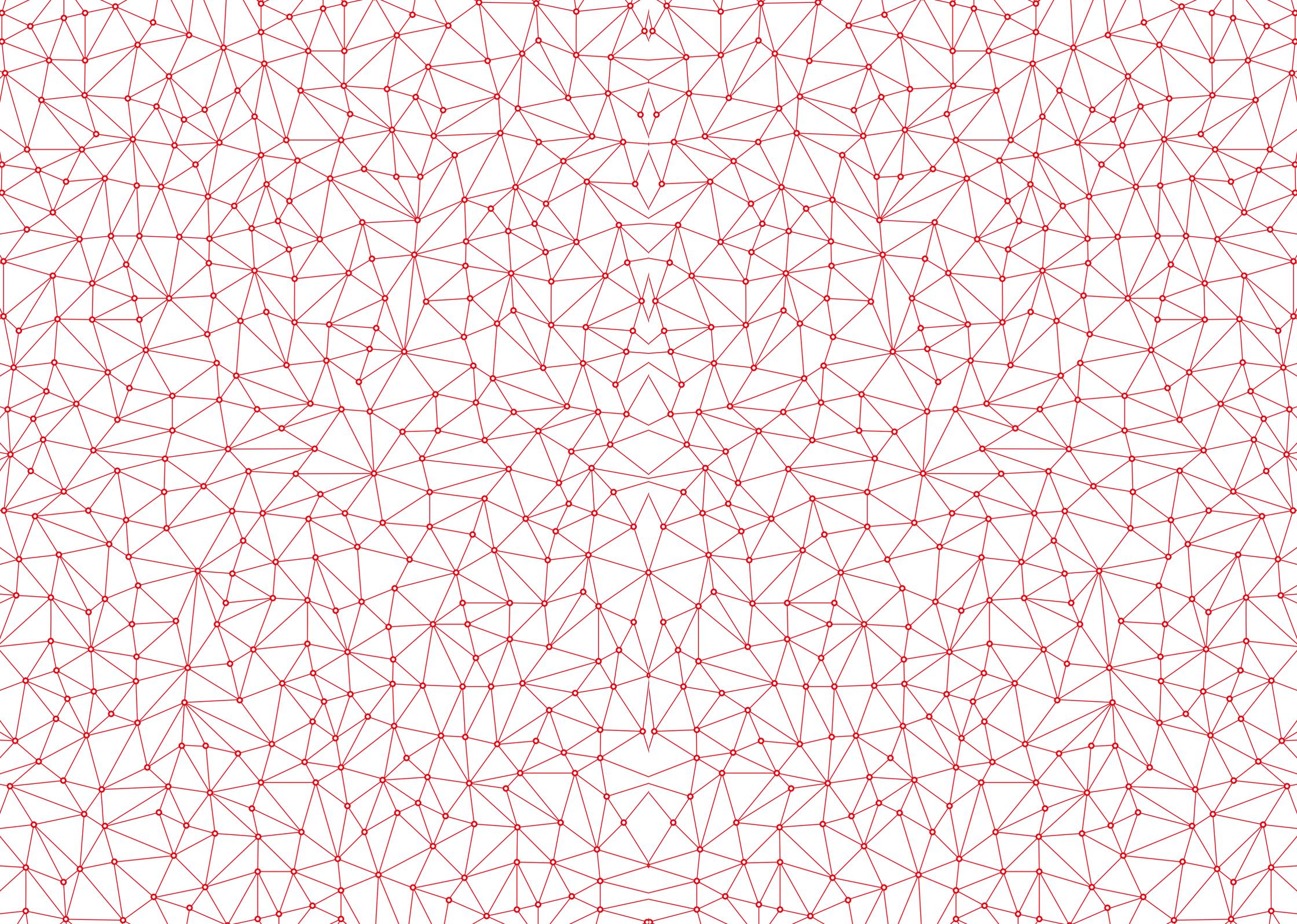




# Digital Ethics

Trust in the Digital World

A Compendium by eco – Association of the Internet Industry



# Digital Ethics

Trust in the Digital World



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## Foreword

**by Dr. Katarina Barley**

German Federal Minister for Justice and Consumer Protection

We need to talk about digital transformation and ethics. For too long now, only the former has been considered, while the latter topic has been neglected. The rate of digital transformation is accelerating and we as a state must do everything we can to keep up with the times. Because new technologies entail not only new opportunities, but also new risks and consequences. Some sectors of the digital world are not yet covered by legislation. This is a situation that we as a society cannot afford to leave as it is.

It is estimated that there will already be 50 billion connected devices worldwide by 2020. Not only computers and cell phones, but also washing machines, refrigerators, aquariums, light bulbs – even simple electrical appliances will soon be connected to the Internet. This growth is exponential and unstoppable. These devices not only make our daily lives easier; they also collect data from which conclusions can be drawn about our everyday behavior, lifestyle, and thought processes.

Possible consequences of the mass collection of personal data became apparent in March 2018. That is when it came out that the data analysis company Cambridge Analytica had used data collected from Facebook to microtarget and influence political decision-making in the US election campaign. People were shown political messages depending on how they were assessed: scaremongering messages for the disheartened and hate messages for the angry masses. It shows the economic and political power that large platforms and service providers have online, with user data in the millions at their disposal that they can evaluate and commercialize.

Privacy and self-determination are also very important in the digital world and enjoy special protection. The commercial analysis of private data for targeted advertising touches on the right to informational self-determination. Political manipulation endangers democratic processes. We need clear rules that set limits for companies.

In the coalition agreement, we therefore stipulated that we would create more transparency in the algorithms. We need obligations to inform and notify if, for example, scoring algorithms are used. But we also need a discussion on ethical standards in the digital world. The IT industry and companies must take action. Now that many companies have already committed themselves to corporate social responsibility, it is now time to devote efforts to corporate digital responsibility.

This is also advantageous for companies. Responsible handling of data is an important criterion for many citizens. The competition, which perhaps handles personal data better and more transparently, can quickly have a decisive advantage in the market.

We want to know more precisely which course we need to set here, especially when it comes to algorithms and artificial intelligence. This is why we have established the Data Ethics Commission in cooperation with the German Federal Ministry of the Interior (BMI). It is intended to provide results that can still be incorporated into the work of this legislative term. One thing is totally clear: This cannot be done without binding rules. In doing so, we must not lose sight of business interests, but we must still protect the rights of our citizens.

The “digital wilderness” can only be tamed legislatively if we have this discussion about ethical standards and find clarity about how we want to shape this new order to the satisfaction of all.

Only then can citizens and companies navigate their way safely in the digital world. The “Digital Ethics Compendium” makes a valuable con-

tribution to both advancing the discussion on this topic and to addressing different perspectives and questions.



**Dr. Katarina Barley**

German Federal Minister for Justice and Consumer Protection

## Steering the possibilities of digital transformation humanely and democratically

**by Dr. Klaus von Dohnanyi**

Chairman of the Advisory Board, Wegweiser Media & Conferences GmbH Berlin

In recent years, the debate around digital transformation in Germany has focused on the question of whether we can keep pace with global developments. The late start for digital transformation in business and administration and the predominance of foreign companies – especially, of course, US companies – in the markets of providers and consultants were worrying news. Will Germany be left behind in the international markets? Unfortunately, these questions are in essence still current.

In the meantime, however, one focus of the debate has shifted to a further aspect: the unintentional consequences of the so-called “disruptive technologies;” i.e. the unintentional and undesirable, even dangerous consequences of the digital transformation which is currently progressing at exponential speed. The questions of the possible negative consequences of digital transformation have now come to the fore on the title pages of both classic and new media; not only in Germany, but in the entire industrialized world.

Questions like:

- What does digitalization mean for jobs?
- Is it at all possible to successfully retrain or further educate large parts of the traditionally employed population in today’s education and training structures?
- Will educational selection on the basis of digital literacy skills divide

society even more so than today's education system already does?

- What impact will the possibilities of artificial intelligence have on warfare?
- What does the entire virtual development mean for the foundation of our democracy, which has been built on the basis of a multitude of so-called self-evident secondary virtues such as decency, respect for law and order, or tolerance?

It is these and many other aspects that should motivate us to discuss more openly the consequences of our actions and non-actions. On the one hand, it remains certain that no aspect of the digital transformation can be stopped, just as little as the use of the bicycle, the stagecoach, the train, the airplane, or the telephone once was. On the other hand, however, the effect of these "disruptive technologies" certainly goes even deeper than Gutenberg's printing revolution; it is probably most comparable with the introduction of writing 4,000 or 5,000 years ago. However, the dispute on recollection vs. written memory once conducted in Greece and reported by Plato had no consequences: Writing won, as digitalization is winning today.

However, from my point of view, we are still not aware of how profound the effect of this change will be, and of how ruthlessly it will progress. That is why we cannot begin early enough to deal with the expected consequences and their possible controllability. Because this revolution will totally disrupt our society. And because of the exponential speed at which it is currently progressing, we must try today already to consider the possible consequences.

Marshall McLuhan, certainly the most important media scholar of the last century, wrote in 1964 in "Understanding Media – on the Extensions of Man": "No society has ever known enough about its actions to have developed immunity to its new extensions or technologies."

With this in mind, it is necessary today to understand fearlessly what change we are facing and what opportunities exist today and tomorrow to drive it forward, on the one hand, and to steer it in the interests of social cohesion and democratic citizenship, on the other.

# Ethical Standards for Digital Technologies: Evolution instead of Revolution?

by **Oliver J. Süme**

Chair of the Board, eco – Association of the Internet Industry

Digitalization and ethics – why is this a topic for a whole book? The digital transformation of our social, political, and economic systems is initiating societal changes in regard to our communication, our patterns of interaction, our world of work, and our value chains, not to mention our values and norms. As a result, many new questions and challenges are arising for politics, for companies, and for each and every one of us. Digital technologies which find their applications in the areas of artificial intelligence, data processing, the Internet of Things, or social communication platforms are always so-called dual-use technologies – meaning that they can be both a blessing and a curse, can be used for benign purposes or abused to criminal ends. Given this, when it comes to digitalization, we also need to ask ourselves the questions: How do we want to make use of digital technologies? How do we want to shape digitalization? Or more concretely, on the premise of ethically-based good behavior: How do we guarantee a good life for everyone in the era of digital transformation?

Of course, in conjunction with ethical behavior, the question of responsibility always arises. Who is responsible for ensuring that digitalization remains a blessing and does not become a curse? Who defines ethical norms, guidelines for behavior, and ultimately legally binding framework conditions for the development and use of digital technologies? As Europe's largest association of Internet companies, we at eco see not only politics as having a duty – we are strongly convinced that ethical guidelines relating to digitalization can only be developed

as part of a sustained dialog between society, politics, and companies within individual nations, and across borders worldwide. With their developments, products, and services, Internet and digital companies drive forward digital transformation and therefore certainly also should bear part of the responsibility for answering the societal questions that arise.

Oftentimes, companies have already taken on responsibility here, and have become active regardless of state regulations. An excellent example of this is the eco Complaints Office, which we have been operating very successfully under the auspices of eco for around 20 years. Together with Internet companies, and within a worldwide network, the Complaints Office works towards the rapid deletion of illegal Internet content such as child sexual abuse material (CSAM) or hate speech, and is a reliable partner in this for state-based law enforcement agencies.

This example brings me to a further important point in relation to ethics and digitalization: the question of the definition and enforcement of ethical norms. I have already indicated that a reform of our ethical behavioral norms can only be approached in the context of a process that involves the entire society. But does enforcement also require a reform of our legal system? I am of the opinion that it will need to be much more a case of evolution rather than revolution. Even today, the Internet is no longer a legal vacuum – despite regular proclamations to the contrary by critics. In Europe in particular, we already have a tight legal framework for the Internet. In addition, many conflict cases in the digital world are solved with the legislation from the analog world, for example in the area of competition law. As a result, I am convinced that we do not need a flood of new legal framework conditions and regulations; instead, we must initially apply and, if necessary, adapt our existing legal culture to the new technologies.

It is my belief that digitalization will also make necessary a re-thinking of the possibilities for shaping the political system. Self-regulation,

true governance rules, and ethics in digitalization can better capture complex, innovative, and future-oriented issues than rigid laws that are limited to retrospection can. This is the motivation for an ethical debate and ethical behavior of the Internet industry.

I therefore wish at this point to thank Wegweiser GmbH and Oliver Lorenz for the opportunity that eco was given to participate as a partner in the Congress on Societal Dialog Ethics & Digitalization in Berlin in April 2018. This compendium is basically a summary and continuation of the topics, positions, and discussion points on the topics of ethics and digital transformation that arose during the congress. I hope that we can thus contribute to the societal debate on ethical questions relating to digitalization, and in so doing, further the dialog between civil society, politics, and companies.



**Oliver J. Süme**

Chair of the Board, eco – Association of the  
Internet Industry



**Focus 1 –  
The State & Framework Conditions**

Can the state keep  
pace with the  
momentum of  
digitalization and still  
achieve social progress  
for all through  
technological innovation?

## Ethics in Digitalization

by **Henning Lesch**

Head of the Capital Office and Head of Policy & Law at the  
eco Association

Societal values and the conception of what should be seen as “good and right” are subject to constant change. Rarely do they appear in a revolutionary manner, but rather as a gradual – if unsteady – process of development, in which the changes do not manifest themselves directly and obviously. And yet, every so often an event occurs which raises the question of what we see as “good and right,” and what we as a society reject as unacceptable. Added to this is the fact that this conception does not always find unanimous acceptance – either globally, or even in different parts of Europe. The classical world that existed before the fourth industrial revolution – in which nation states determined laws and enforced them within their respective jurisdictions, and could see this as a product of their values and norms that in turn determined our ethics – is on the verge of a radical change.

Digitalization, and the Internet as its key technology, is raising new questions for traditional approaches. And existing rules and values need to be discussed anew against this backdrop. While a few years ago it was, for example, quite simple to prohibit a publication and destroy already printed copies, it is no longer readily possible with a home page – and even less so with one that is hosted abroad, and therefore not initially subject to national law.

In Germany, for example, there is currently an active debate on the topics of hate speech and freedom of opinion in the Internet, and how these are to be demarcated. This debate, and the resulting Network Enforcement Act (NetzDG), illustrate both the tension between the values in question and the challenges for defining and enforcing rules that should express these values.

The NetzDG also shows that – through the global character of the Internet and the rapid technical developments that are occurring – both the definition of these rules and the values that act as the basis for them need to be discussed anew, again and again. A fundamental insight would be that – similar to other global phenomena such as limiting emissions in response to climate change – a singular, nation-state approach does not always help, and that legal regulations alone are not sufficient. Rather, they often lose themselves in empty political symbolism or completely miss the mark.

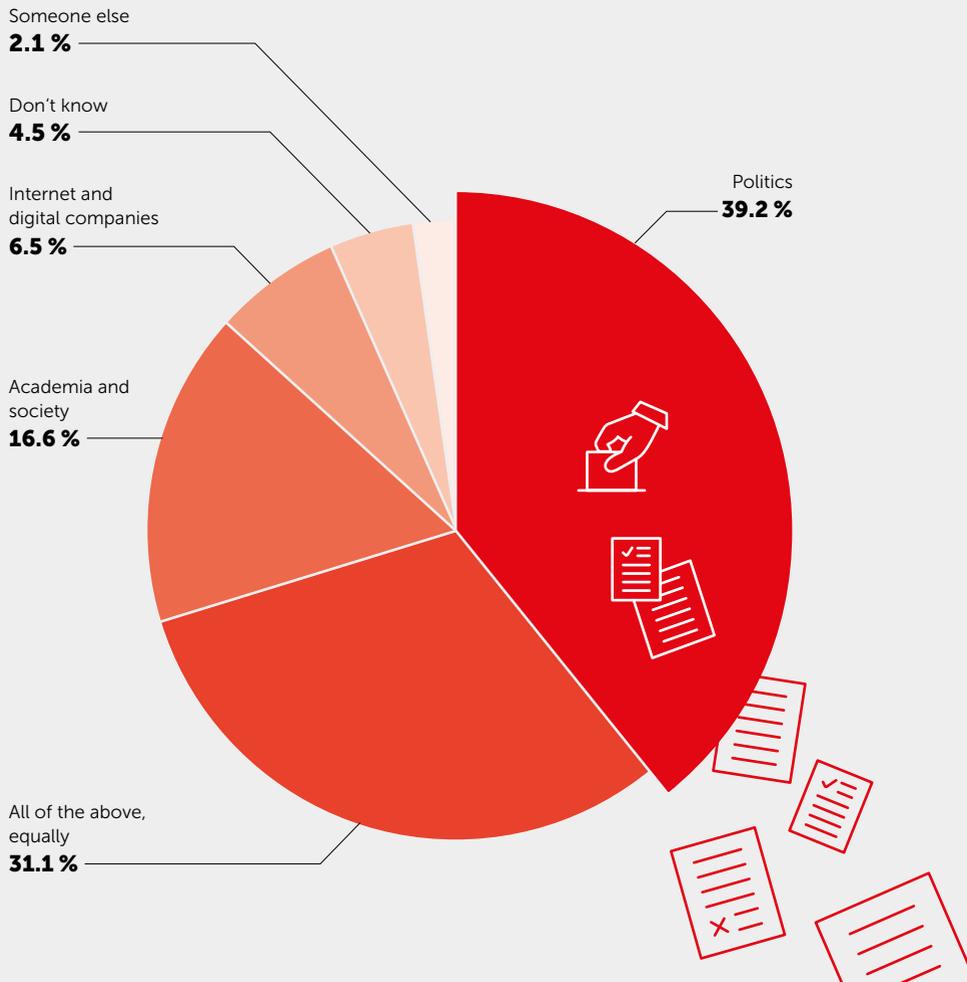
Added to this is the fact that digital technologies are penetrating new areas more and more strongly. Whether in the health sector, in manufacturing, at the office, or when shopping: digital technologies and assistants have already become a fixed component of everyday life for the majority of the population. The capability to process, combine, and maintain data and information to a hitherto unknown extent poses as many questions for industry, society, and the state as dealing with the possibilities of automation and the increasing use of (partially) autonomous systems does. How are traditional economic and industry branches changing, and where do they stand in relation to the digital economy? How will work be organized and shaped in the future – economically and individually? In the context of the transformation now in full swing, these questions cannot always be answered *ex ante* and concretely. We perceive the changes, see the emerging developments, the opportunities and potential – but also the risks, the anxiety, and the uncertainties that accompany increasing digitalization and interconnectedness.

We must nevertheless find – at least preliminary – answers to the multi-faceted and complex challenges of a digitalized and connected world. This can only succeed if we create a societal consensus and offer orientation in the era of digital transformation. Rights, needs, and legitimate interests must be preserved, balanced, and brought into harmony if societal consensus is to be preserved and society is not to be split.

## What does the German population think?

### In your opinion, who carries the main responsibility for creating rules for the use of digital technologies?

The majority of the population wants the state to provide framework conditions for the use of digital technologies. But more than a third of the population sees a shared responsibility between politics, companies, academia, and society.



Politics and society are already to some extent discussing these questions and attempting to find answers. But industry and companies need to reassess their behavior in the context of digitalization. The assumption of social responsibility is gaining increasing importance for companies in the light of digital transformation. Alongside classic topics relating to “Corporate Social Responsibility” – such as environmental aspects, questions of employment security, and employment relationships in companies and in their supply chains – questions as to the consequences of technology and the discussion of ethically-oriented guidelines on particular aspects of digitalization are coming more strongly to the fore.

The self-regulatory approach, which has characterized the Internet since its beginning, demonstrates its effectiveness more and more often, also in other areas in which digital technologies are being used. It creates bridges to connect networks, services, and people with one another, and it shows the limits, the points at which elementary values are at risk.

eco, as the Association of the Internet Industry, has been advocating for an open, technologically neutral, and high-performance Internet for more than 20 years. As the voice of the Internet industry, together with our member companies, we are assuming increasing social responsibility for a digital transformation for the good of all, and an ethically-oriented digitalization – for example, through the intrinsically motivated and largely self-financed eco Complaints Office, which, in cooperation with companies and law enforcement agencies, is active in the fight against illegal content in the Internet and works towards takedown and the prosecution of perpetrators. And through supporting industry self-regulatory approaches, as the successful concept of the Certified Senders Alliance demonstrates. But also on an international level, with our activities in the area of Internet Governance.

Digital transformation demands a contemporary legal system and a review of formal and material law with regard to its suitability to digital topics. In order to shape the opportunities and potential of digital transformation positively, one of the central challenges will be whether we can succeed in transferring our societal ethics and the existing set of values to the digital era, and in further developing them. The current debate must involve the entire society and cover a broad spectrum of ethical issues in the area of digitalization, so that an ethical digitalization, shaped according to ethical values, can succeed. For this, a new definition needs to be discussed for the understanding of the roles of politics, the industry, civil society, and the media.

## Expert Opinions

In addition to the many positive possibilities and consequences that the age of digital transformation brings with it, there are also always recognizable negative side effects that have recently come increasingly into the focus of public debate. If we want to avoid a “techlash,” i.e. a setback that would hinder the overall development of the necessary digitalization process in Germany, then we must begin an open discussion of these issues without delay. The German federal government seems to have recognized this problem and is sending an important signal with the measures planned in the coalition agreement. However, the creation of a ministry for digital transformation as an effective central coordination point for digitalization continues to be ignored. So, what role can or must the state play in this discussion (possibly also in a regulatory capacity) so that this process of change leads to social progress from which everyone benefits?

**Iris Plöger**

Member of the Executive Board, The Federation of German Industries (BDI)

We all expect countless improvements in our lives from digitalization. In healthcare, we will find new solutions for chronic or life-threatening diseases. Autonomous driving will significantly increase road safety and save all road users time on a daily basis. Intelligent assistance systems will support us in our professional activities and make it easier to find a balance between family and career. Such profound changes in many areas of life will, of course, also have an influence on our regulatory framework. This is where the political arena is called upon. It must enable continuous and broad social discourse. The aim must always be to keep the legal framework as open to innovation as possible. Even though innovation cycles are getting shorter and shorter, regulatory quick fixes are not the appropriate response. This way, we can ensure that digitalization picks up as much momentum in Germany as in other regions of the world.

**Dr. Christoph Krupp**

Head of the Senate Chancellery, State Councilor for IT and Digitalization, Free and Hanseatic City of Hamburg

Citizens and companies rightly expect the same digital service quality from the state and the administration that they experience in their everyday and business lives. So, a lot still needs to change. All the more important is the question of who controls whom here: Does digitalization control us or are we in control of digitalization? Modern software architectures must allow us to steer digitalization in tracks that are consistent with our notions of democracy and freedom. Thus, the digital self-determination of the state must be guaranteed at all times. Decisions made by algorithms must be transparent and verifiable by analog means. The federal system must be strengthened and not give way to a new centralism. Services and registers must communicate with each

other, but not be merged. The level of transparency for citizens and businesses must increase. They need to know where their data is located and decide themselves who is allowed to access it.

**Anke Domscheit-Berg**

Member of the German Federal Parliament for Die Linke

The potential of the digital society is marked by extremes. The future is a continuum whose possible manifestations range from horror scenarios to visions of paradise. In the horror scenarios we find digital totalitarianism (see China's social scoring system and NSA surveillance), mass unemployment, warring autonomous weapons systems, hacked critical infrastructures, and child sex robots. The nicer vision of the future also gives us less work – but more fairly distributed and an unconditional basic income. Investments finance public-interest innovations that enable participation, protect the climate, feed us and make us healthy – in a society where public services and lifelong education are easy and accessible. Politics sets the course for the future that will become reality for all of us. For this we (at long last) need a vision of our desired society and a long-term strategy that leads to it.

**Dr. Anna Christmann**

Member of the German Federal Parliament for Bündnis 90/ Die Grünen

Digital transformation offers new opportunities to develop the world positively. Technical and social innovations can help us to master the challenges of the 21st century, such as the mobility revolution, energy transition, or the fight against rare diseases. Fast data centers and artificial intelligence will potentially change our society more than we currently suspect. It is the shared task of politics and society to shape digital transformation in the public interest. In the past, the German federal government has both failed to provide the necessary infra-

structure and failed to make the necessary efforts in data protection, IT security, and digital education in the form of a coherent digitalization strategy. With clear responsibilities, the necessary financial resources, and the know-how in the new technologies, we need to regain control over the question of what kind of digital transformation we want.

## The eco Complaints Office – Regulated Self-Regulation That Works!

by **Alexandra Koch-Skiba**

Attorney-at-Law, Head of the eco Complaints Office

Already today, digitalization has penetrated all areas of our society and has become a central economic factor worldwide. It is quite clear that our future, and the future of our children, is digital. Digital education is therefore becoming an increasingly key competence for participation in both working life and social life in a society that is increasingly being shaped by digital technologies.

For us, it is important that children and young people are able to surf the Internet without being exposed to dangers. The fight against illegal content and content which is harmful to young people is therefore a challenge that eco takes very seriously.

For around 20 years, eco has been successfully fighting against illegal content in the Internet, and doing this primarily through self-financing. The voluntary commitment has always been important for us as the Association of the Internet Industry, in order to strengthen trust in the Internet and to thus contribute responsibly to the betterment of our society.

Hotlines are an important point of contact for all Internet users: Many citizens shy away from reporting suspicious online content directly to the police, out of the fear that they themselves could end up being part of the investigation. This is especially the case when it comes to reports of child and youth sexual abuse material. At the same time, not all banned content directly represents a crime, meaning that the police are not always responsible.

Our members (on whose initiative the Complaints Office was founded in the first place, with the establishment of the ICTF – Internet Content Task Force) also benefit from our service. The eco Complaints Office lawyers examine all reports and forward illegal content to law enforcement agencies and providers. In this way, illegal content is taken down quickly, and the perpetrators brought to justice.

We are proud of the good cooperation with our members, law enforcement agencies, and other hotlines, as well as our active support of committees and initiatives – this network makes the eco Complaints Office an ideal mediator between the industry, the state, and Internet users.

Given that there is always more strength in working together, and that the Internet knows no state borders, it is of particular importance to be well connected around the world. For this reason, eco is a founding member of the international network of hotlines, INHOPE. More than 45 hotlines from over 40 countries belong to the network, and they are able to forward reports to each other when the content reported is not hosted in the hotline's own country. The Quality Assessment Report published annually by INHOPE was a particular highlight in 2016, given that it provided evidence in all points of our exceptionally good work.

Internet service providers and Internet companies demonstrate a great deal of responsibility in the context of the successful cooperation between hotlines and law enforcement agencies. However, it needs to be clear: Consistent prosecution is essential to effectively combat crime in the Internet. The state must address the cause of the problem through effective prosecution of the perpetrators, and create a strong public awareness for illegal statements and content, through the fostering of media competence.

### How the eco Complaints Office works

The eco Complaints Office has been fighting against illegal online content for around 20 years. It is embedded in the system of regulated self-regulation and is especially tasked with improving youth protection in the Internet.

Internet users that come across illegal, in particular youth-endangering, online content can report this free of charge and anonymously to the eco Complaints Office at [international.eco.de/eco-complaints-office](https://international.eco.de/eco-complaints-office), [www.internet-beschwerdestelle.de/en/index.html](https://www.internet-beschwerdestelle.de/en/index.html) (the joint portal of the eco Association and the Voluntary Self-Regulation of Digital Media Service Providers (FSM)) or by email to [hotline@eco.de](mailto:hotline@eco.de). In addition, the eco Complaints Office is a partner of the German information platform for young people [jugend.support](https://www.jugend.support) and collaborates with the FSM hotlines and [jugendschutz.net](https://www.jugendschutz.net) on the processing of reports received over the platform. To effectively combat illegal online content, cooperation with other relevant actors is vital. eco therefore cooperates with, among others, providers, partner hotlines, and law enforcement agencies. eco is also a founding member of the international network of hotlines INHOPE and part of the German Safer Internet Centre.

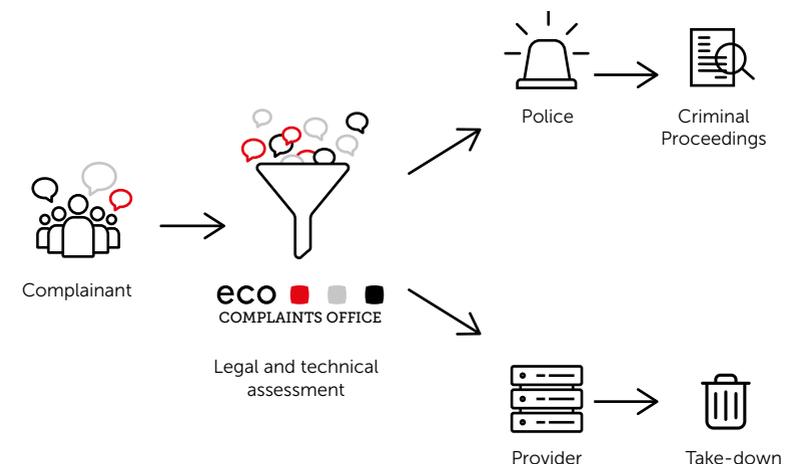


Fig. 1: How the eco Complaints Office processes complaints

**Simple and anonymous: Report a complaint**

The eco Complaints Office accepts complaints about all Internet services: World Wide Web, emails, exchange platforms, chats, newsgroups, discussion forums, and mobile content. The content can be hosted on both national and foreign servers.

**Complaints Office in Figures:**

In total in 2017, 27,660 reports (not including Spam and Usenet) were received by the eco Complaints Office, of which 4,063 cases were relevant. Worldwide, around 95% of the URLs eco found fault with were removed from the Internet (of these, around one fifth of the URLs, or to be precise 20.85%, were hosted in Germany).

**Growth rates in hate speech: Balancing act with foundational democratic principles**

The German legislative initiative regarding the controversial Network Enforcement Act (NetzDG) was a central topic for the eco Complaints Office in 2017. Through this, phenomena like “Hate Speech & Co” came increasingly into the focus of public awareness. We experienced high growth rates in reports relating to racism – in comparison to the previous year, the number of reports received rose by more than 120 percent. However, reports relating to this type of offense in particular demonstrate time and again how important a careful legal examination is. 76 percent of the content reported was ultimately not objectionable under German law, and was in fact permissible. It is not unusual for legally borderline cases to be reported. It is always a balancing act with foundational democratic principles.



Further information can be found at

<https://international.eco.de/eco-complaints-office>

## The Certified Senders Alliance – How self-regulation can help increase the quality of commercial e-mails

by **Julia Janssen-Holldiek**

Director, Certified Senders Alliance

In the digital environment, legitimate marketers have been facing an increasing challenge to make their newsletters and commercial emails stand out against the background noise of spam. The eco Association approaches this challenge from two different perspectives. On the one hand, combatting spam itself is a task undertaken by the eco Complaints Office. On the other hand, it is also important to support companies, brands, and marketers who aim to rise above the noise by ensuring the quality of their marketing emails. This is where the Certified Senders Alliance (CSA) comes into play.

The Certified Senders Alliance (CSA) was established in 2004, as a joint project between eco – Association of the Internet Industry and the German Dialogmarketing Association (Deutscher Dialogmarketing Verband – DDV). It is the goal of the CSA to optimize the quality of commercial emails (e.g. newsletters, invoices, order confirmations, etc.) and raise them to an internationally accepted standard of quality. To achieve this, the CSA establishes and regularly updates legal and technical quality standards, certifies commercial email senders that fulfill and maintain these standards, and operates a whitelist for certified senders in cooperation with mailbox and spam-filter providers. In this way, the entire email ecosystem can work together to improve the quality and deliverability of legitimate marketing emails from serious senders.

Participants in the Certified Senders Alliance voluntarily subject themselves to the CSA rules of procedure, based on the CSA's quality stand-

ards for email marketing. The quality standards arise out of prevailing law and the technical requirements from mailbox providers. This includes, for example, ensuring compliance with data protection law, such as the EU General Data Protection Regulation, as well as technical procedures like DomainKeys Identified Mail (DKIM) and Sender Policy Framework (SPF) for email authentication.

But perhaps you think that such an initiative could only represent a small drop in the ocean compared to those senders who do not comply with best practices. So, how can the CSA actually help to improve the quality of email overall, and how can this benefit the certified senders?

The answer lies in the whitelisting – the maintenance of an IP list which is used by participating mailbox and spam-filter providers – supported through education, and through bringing the emailing community together.

The CSA acts as a neutral interface between mailbox providers and senders of commercial emails. Mailbox and spam-filter providers want to keep their customers happy and customer inboxes free of junk. To this end, they make use of spam filters. If an email gets caught by a spam filter, it will not be delivered, or it will be delivered to the user's spam folder. This results in a loss of sender reputation, which has a long-term impact on the sender, as future deliverability will also be affected.

One problem that occurs here is that not only spam gets filtered out. It can be that legitimate emails – be they newsletters, order confirmations, or invoices – also get filtered out. This can pose a problem for both the sender and their customers, especially when relevant transactional emails are concerned.

Given that the IP addresses of CSA certified senders are on the CSA Whitelist, and mailbox and spam-filter providers can access this whitelist, CSA senders are protected from this risk.

This raises the bar for all senders. It means that there is a real benefit for marketers and brands to behave responsibly with their commercial emailing, in the knowledge that this will keep them on the whitelist, improve their reputation as a sender, and increase their chances of regularly landing in customer in-boxes.

Self-regulatory approaches are very successful when there is industry-wide engagement in finding a solution to an existing problem. This is exactly what occurs in the wider email ecosystem, when the different industry communities come together through their involvement in the CSA. Both the senders and the receivers have an interest in improving the email experience of their mutual customers, and they are able to work towards this goal within the CSA.

### **The certification process**

The CSA quality standards cover legal and technical admission criteria. Email senders that are capable of fulfilling these quality criteria can apply to be certified by the CSA.

To start the certification process, senders need to provide samples of their email marketing for legal and technical examination. These are assessed in relation to the CSA Criteria. Emailing experts from the CSA will then support the sender with any aspects that need to be improved. A final stage is approval by the CSA certification committee, which includes representatives of both the sender (email service provider) and receiver (ISP/mailbox provider) communities.

Once the sender has been certified, their sending IP addresses are added to the CSA Whitelist.

### **Maintaining quality standards**

Once certification is complete, the CSA has several monitoring measures in place in order to support sender compliance with the CSA criteria. Samples of senders' commercial emails (e.g. newsletters) are regularly checked to ensure continued technical compliance. The CSA also employs data from mailbox providers such as spam trap hits, which are used to assess the senders' list hygiene and reputation. The CSA also regularly checks whether certified IP addresses have been put onto blacklists.

The CSA works closely together with the eco Complaints Office. If complaints are made by individual users regarding a certified sender, the sender is informed and steps are taken to ensure any legal or technical issues arising are dealt with rapidly. The Complaints Office undertakes a comprehensive legal assessment of the sender's emails in this case.

In this way, the CSA maintains the promise for quality towards participating partners using the whitelist. At the same time, certified senders get early warnings from the CSA to help ensure current and future deliverability of their emails. Consequences of non-compliance are stated in the Rules of Procedure, starting with a reprimand, and going through to temporary removal from the whitelist or even exclusion from the CSA community.

### **The CSA in Numbers:**

In 2017, the CSA enjoyed continuous growth, as in the previous year. The CSA received 250 certification inquiries, of which 17 companies fulfilled the CSA's strict requirements and were welcomed into the Alliance. The CSA counted 110 certified senders by the end of 2017. The number of certified IP addresses rose by 30 percent in comparison to 2016, to reach 60,577 at the end of the year. 2017 also saw growth on the partner side. Six new ISP and technology partners joined the CSA, including Microsoft, one of the largest mailbox providers worldwide, bringing the total number of partners up to 48.

### Providing Educational Opportunities to Email Senders

The Certified Senders Alliance is committed to its mission of creating quality standards for email marketing, and establishing them in the market. To achieve this, the CSA team also engages in educational initiatives with certified senders. As well as offering legal workshops, the CSA provides detailed material and advice on how to deal with any relevant new laws or amendments. On the technical side, the CSA supports the adoption of technologies and processes which strengthen the security and authenticity of commercial emailing. One example is the CSA's strong advocacy for Domain-based Message Authentication, Reporting and Conformance (DMARC), which further enhances email authentication. The CSA supports senders who wish to implement DMARC, and provides documentation and advice relating to the benefits and the technical process.



More information online at <https://certified-senders.org>

## Digital Fundamental Rights and Internet Governance

by **Prof. Michael Rotert**

Honorary President of the *eco* Association

Fundamental rights cannot actually be either digital or analog! In this respect, considering fundamental rights under the banner of “digital” does not make a lot of sense – there is also no digital constitution. Many states have incorporated general human rights as fundamental rights into their constitutions. Thus, (digital) fundamental rights almost always relate to a state territory, or also to the European Union.

But perhaps digital fundamental rights only apply to algorithms and software, and not to people? That would indeed be a sensible demarcation: such rights would then need to be implemented in every piece of software. Artificial intelligence processes (AI) would certainly offer themselves for this. But this raises the questions of why we do not directly take the applicable fundamental rights or even the globally applicable human rights. The Council of Europe has already produced a “Guide to Human Rights of Internet Users.”

Incidentally, attempting to regulate artificial intelligence in this context would prove to be absolutely senseless, because at most it would be possible to regulate the underlying algorithms, not the collective concept.

If you ask the Internet about the term “digital fundamental rights,” you come across the “Charter of Digital Fundamental Rights of the European Union.” According to the website [digitalcharta.eu](http://digitalcharta.eu), the charter was developed by a group of German citizens as a proposal to be presented to the European Parliament. The first version hails from 2016 and can be found just as easily in the Internet as the re-worked 2018 version.

Looking through the proposal for the “Charter of Digital Fundamental Rights,” it becomes apparent that, in the main, civil society participants, with a smattering of academia, were involved in its development. Of course, everyone was able to comment on the proposal via the Internet, but a true multi-stakeholder process looks different. Stakeholder groups like the “private sector” or “governmental participants” are not to be found. This lack was further amplified by the fact that the intention was to develop a proposal for the European Union, but the organizers simply neglected to invite other European countries to participate. In this respect, this Digital Charter is a national paper with, so far, very limited support, and it is procedurally a long way removed from the idea of Internet governance.

But what should we do with such a paper?

One starting point would be to re-work the original “Charter of Fundamental Rights of the European Union” and formulate it in such a way that there is no need for a separate charter on digital fundamental rights. Another possibility would be to subject the 2018 version of the Charter of Digital Fundamental Rights to a true multi-stakeholder process – then we would, namely, also have the entire industry “on board.” And in so doing, we could also discuss directly where, for example with AI, individual articles of the fundamental rights could (verifiably) be implemented into the appropriate algorithms and software packages. Such a procedure would also conform to Internet governance processes. All that would be left to clarify is what happens to the software that was not developed within the EU. Ultimately, it would need to be ensured that the implementation of the fundamental rights would not result in a competitive disadvantage for European products.

If, in the long run, special digital fundamental rights do become established, they should be subject to Internet governance, in the same way that regulations, AI, and all the other Internet governance topics are.



**Focus 2 –  
Employers & Employees**

How can employers and employees jointly shape the transformation of the working world occurring through robotics, automation, and digitalization?

## Guidelines for Ethical Conduct in a Digitalized Working World

by **Lucia Falkenberg**

Chief People Officer and Head of CG New Work at the eco Association

As with virtually all areas of life, the working world has been fundamentally transformed by digital technologies in recent years.

We are witnessing how the Internet and related digital applications, as well as the use of technologies based on artificial intelligence, are changing work processes, further developing activities, creating new job profiles, shaking up communication routines, and impacting social structures in organizations.

Employees in Germany currently still have very mixed feelings in encountering these trends. Many do see positive effects of the digital working world: In a recent representative survey conducted by the opinion research institute Civey on behalf of eco, around half (49.5%) of those surveyed stated that they believe that digitalization will improve the reconciliation of family and career.

At the same time, however, many still fear negative consequences for their workplace: in particular, the prospect of artificial intelligence and self-learning machines still incites fear among many employees. For example, more than half (54.1%) of those surveyed by Civey cannot yet imagine working with robots at their workplace. Likewise, a majority of around one third (33.7%) envisage a greater threat for equal opportunities when job applications are evaluated by artificial intelligence.

Without a doubt, many of these assessments are not founded on prior personal experience, but rather on speculation and a lack of knowledge about the new technologies. An essential point in the context of the digitalization of our working world is therefore the topic of education and training. As a representative of the Internet industry, eco is convinced that lifelong learning is one of the – if not the most – decisive success factors for the digital transformation of companies and our entire society.

This view is incidentally shared by the majority of Germans. For example, 85.4 percent of all the Civey survey respondents believe that employees in an increasingly digitalized working world need to undergo significantly more (46%) or rather more (39.4%) further training than today. However, most (41%) of those surveyed in Germany rate the corresponding further training opportunities as poor.

Together, all of these issues pose a series of challenges, for employers and employees on the one hand, and on the other hand for policy-makers, who need to ensure the right framework conditions at the level of employment law.

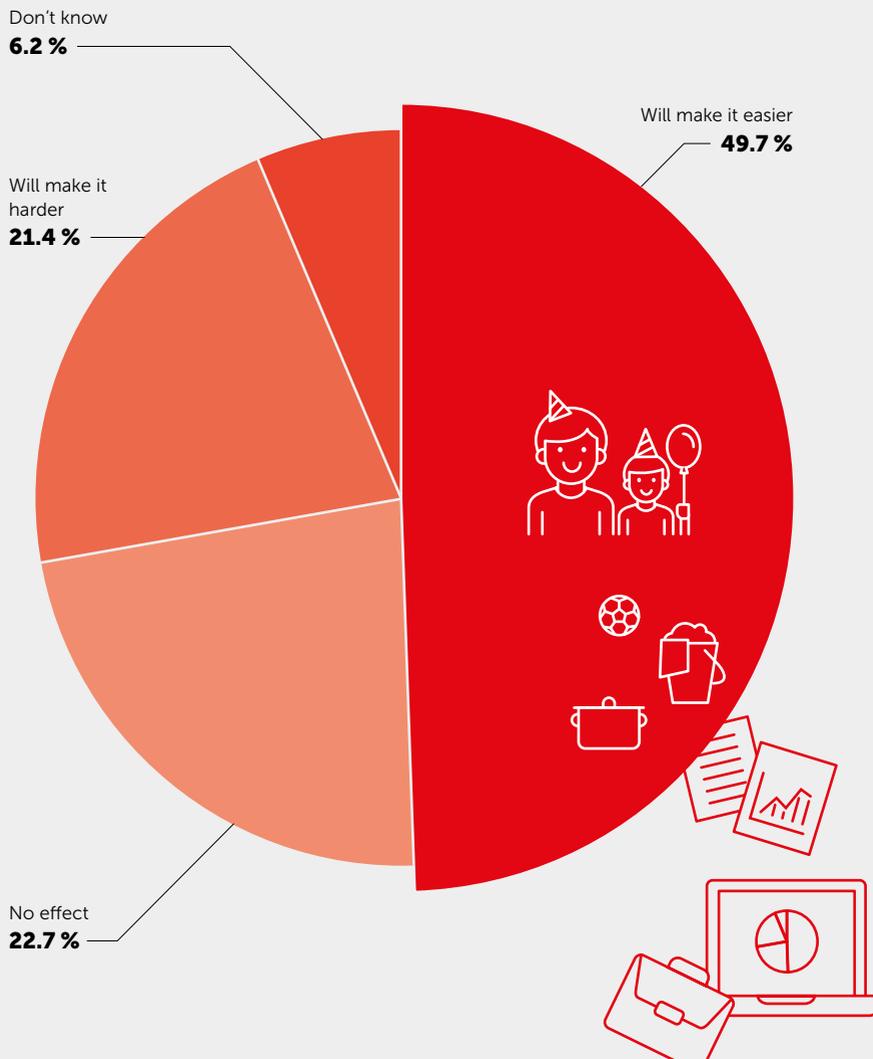
On the employer side, the human resources departments are called upon in particular to act as seismographs and catalysts: They must monitor developments in the context of digital transformation with reference to the new working world, categorize them for their company, evaluate them and, if necessary, facilitate the respective change processes in the company. This is far from an easy task, especially since numerous ethical questions arise in this context, which certainly often require fundamental and top management decisions.

As a standard, eco – Association of the Internet Industry has developed six guidelines for ethical conduct in a digitalized working world for its member companies, which can also be used by all other organizations.

## What does the German population think?

### In your opinion, how will the digitalization of the working world affect the reconciliation of working and family life?

Around half of Germans expect that digitalization will have a positive impact on the reconciliation of working and family life



This guide is neither a directive nor a checklist to be ticked off. Rather, we see it as an initial orientation aid in the search for pointers to answer the relevant questions that responsible companies should ask themselves in the course of the digital transformation of the working world.

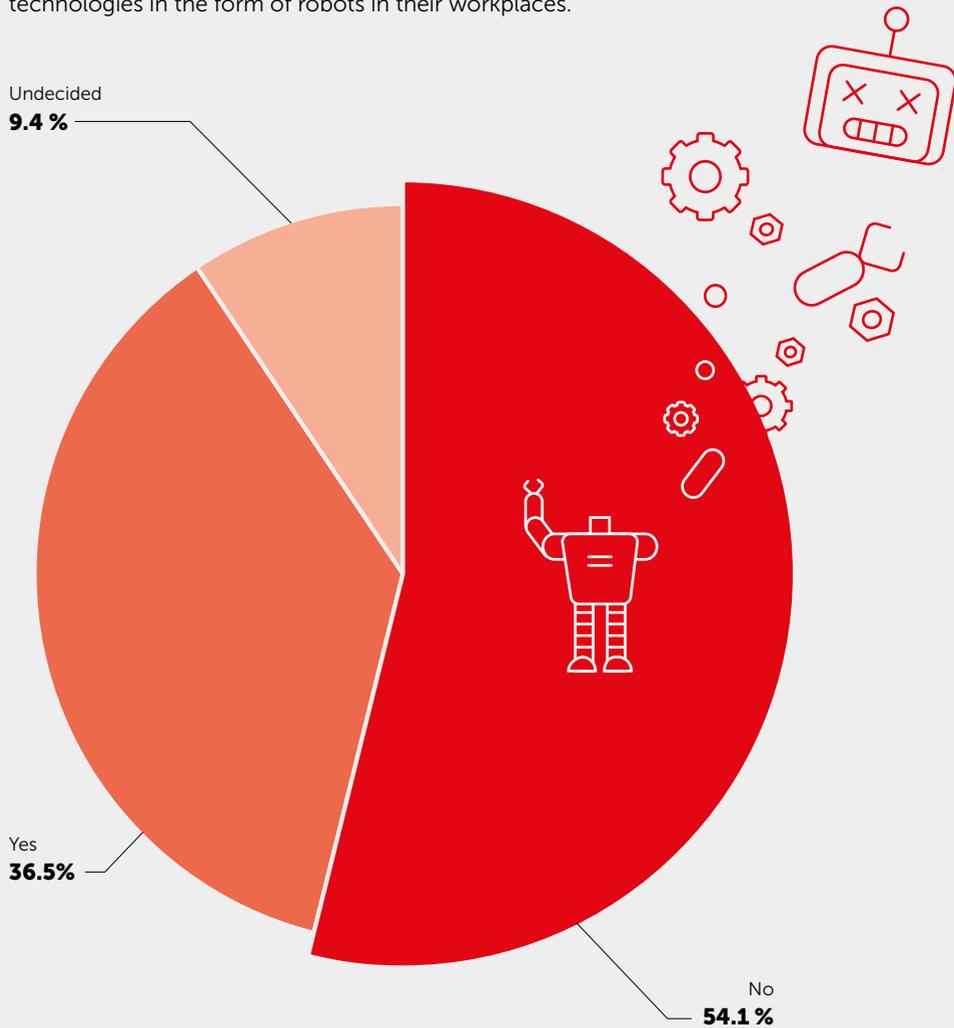
### 1. Companies must develop a code of conduct for the use of digital technologies, especially in the area of human resources

In the coming years and decades, digitalization will lead to profound changes in our working world. Every company, whether it be a small handiwork enterprise or a global corporation, has to deal with what digital transformation means for its business and its employees and how it intends to use digital technologies in the future to profit from the enormous growth potential of digitalization. Inextricably linked with this are always fundamental decisions based on an ethical stance and the question of what a digital working world looks like that places people, instead of technology, in the center, and that involves as many participants as possible. A first step here is a cool-headed consideration of the question of what constitutes AI and the realization that we need to deal more with the question of what should determine the value of human work, instead of either suspiciously observing our robot colleagues as competitors, or attributing human traits and characteristics to them. The starting point for ethical considerations is the question of what the (working) world should look like in which we want to live and work using AI and other digital technologies, and how we can succeed in making the human mind irreplaceable despite (or precisely because of) its assumed susceptibility to error. According to most experts, basic human qualities such as creativity, communication skills, and empathy will continue to be irreplaceable in the future and often go hand-in-hand with non-linear thought structures – as such, it is time to draw attention to these skills. Those who understand the transformation of the working world as representing an opportunity will inevitably need to clarify the fundamental issues in the form of a company-wide Code of Conduct, and to maintain this code as a decision-making basis for all questions in connection with digitalization in the human resources sector.

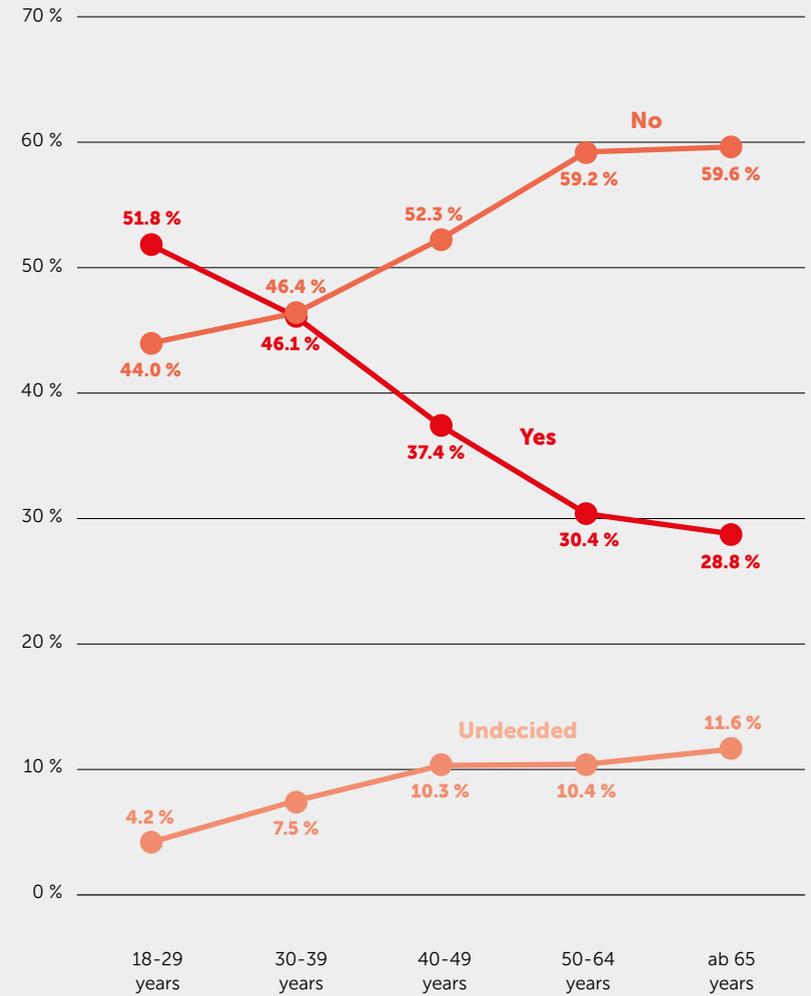
## What does the German population think?

### Could you imagine working with robots at your workplace in the future?

The majority of the population has reservations about the use of digital technologies in the form of robots in their workplaces.



The younger generation views the use of robots in a much more relaxed light than the population average



## 2. Employ digital technologies for the benefit of employees

Digitalization is not an end in itself, but should ensure quality of life and work as well as economic growth. Companies should therefore examine whether and how they can make use of digital technologies to improve their employees' working conditions. On the one hand, this involves the reduction of physically stressful, heavy, and monotonous activities, for example by supporting AI and automation in favor of "healthier work" and more freedom for creative, communicative tasks. On the other hand, companies should review their regulations regarding the time and place of work delivery to see how more flexible solutions and the use of digital technologies, e.g. in the area of mobile communication, can result in advantages for all employees in terms of better reconciliation of job and private life planning. Ideally, this will not only lead to greater diversity in the company and open up new career paths for the large number of highly qualified women, but will also pave the way to greater gender equality for future generations. Companies should also pay particular attention to better integrating those groups of applicants who have had a difficult time on the labor market to date. Thanks to digital technologies, it will be easier to integrate colleagues with physical disabilities or to facilitate employees over the age of 50 to participate in working life on a long-term and fulfilling basis. This potential must be exploited not only because of the shortage of skilled workers, but also in order to enable as many people as possible to enjoy a fulfilled working life.

## 3. Make the use of artificial intelligence transparent

Technologies and applications based on artificial intelligence offer major opportunities for the accurate analysis of large amounts of data and the recognition of patterns. They are suited to supporting and assisting us in decision-making processes, for example by pre-sorting and classifying large data sets. This can help to gain an overview of relevant applicants in the early stages of the recruitment process, for example. More and more companies are using these technologies in their recruitment processes. AI can help here to identify interesting candidates

– an option that is relevant for many companies in times of persistent shortages of skilled workers (according to figures from the Institute of the German Economy, the specialist gap in the IT industry alone more than doubled between 2014 and 2018 from 16,000 to 39,600).

In the interests of transparency, and in order to keep possible appeals open to applicants, companies must make the use of artificial intelligence in the application processes visible.

The algorithms on which the applied AI technologies are based should be non-discriminatory and guarantee fairness and equal opportunities.

Data protection and privacy should always have top priority when artificial intelligence methods are used in application procedures. Ultimately, the customer, in this case the applicant, will decide on the success of the use of AI. Because automated business and decision-making processes are still often met with mistrust, trust must first be developed. Transparency about the use of AI is an essential step in this direction and is a manifestation of the position that AI should support and complement human work.

## 4. Decision-making sovereignty must always remain with people

Digital technologies and AI applications can support us in many activities, accelerate and simplify work processes, and make work results more reliable. Both companies and their employees can benefit from this. All decisions about the use of these technologies should, however, be based on the premise that digital technologies are only tools that people consciously use. In the discussion about assistive or decision-making AI, the person remains the final and decisive authority.

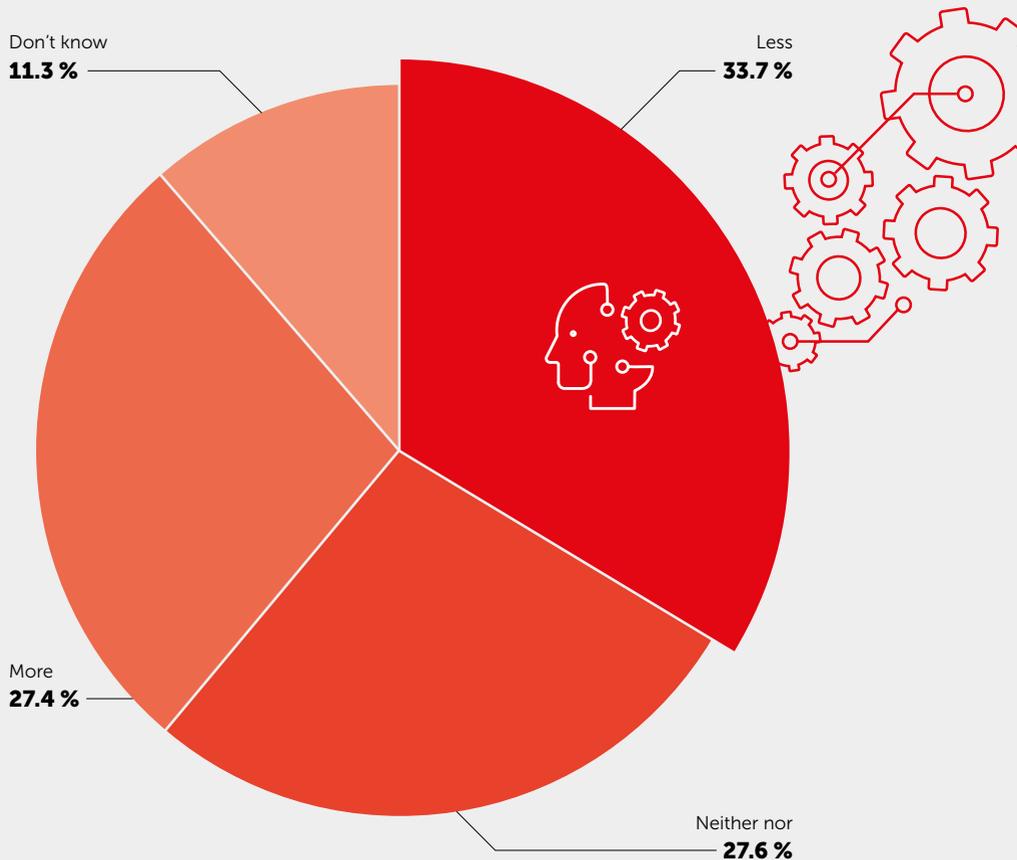
## 5. Develop lifelong learning and digital education concepts

The imparting of digital competencies and the participation of everyone in digitalization should be regarded as an opportunity for society as a whole and understood as a continual and lifelong task. Ultimate-

## What does the German population think?

### In your opinion, will it lead to more or less equality if job applications are assessed by artificial intelligence?

The German population is very undecided about the use of artificial intelligence in application processes. Around one third respectively expects a positive influence on equality, a negative influence on equality, or is undecided.



ly, participation in the digital future requires education, training, and continuing education at every stage of life. Digital transformation is an ongoing process that will shape our working processes and conditions in the coming decades and bring about constant change. With regard to employees, this means that the "half-life" of on-the-job training apprenticeships will be shorter. Lifelong learning must become the standard in all areas of work and industries, whether trades, administration, or commerce. Companies must develop concepts for the continuous further training of their employees with regard to digital skills and the use of new technologies if they want to count on the availability of effective teams and satisfied employees in the long term.

### 6. Corporate Social Responsibility rounds off corporate behavior

Continuing economic success, but also the concern about a present marked by global threats and climate change, are paving the way for a paradigm shift in favor of a value-oriented working world. Questions about sustainable, meaningful work, which can make a clear contribution to our society, will become more important in view of the increasing automation of well-known work processes. In addition to striving for purely economic success, more and more employers are also positioning themselves in terms of the extent to which they are committed to their employees, their health and development, and how seriously they take their social responsibility. For example, the education and qualification concept already presented is a valuable contribution which companies accepting their social responsibility can offer. A credible corporate social responsibility strategy not only plays a key role for employer marketing in the competition for the best specialists, but also complements business growth targets.

## Expert Opinions

Digital transformation has considerably accelerated the longstanding trend towards machine-based automation of human work – in all industries, albeit with varying degrees of intensity. Many people are concerned that the adaptation of labor markets is not keeping pace with the pace of digital acceleration and the increasing use of robots and algorithms. The result: Fear of losing one's job.

Is this widespread concern well-founded and what would have to happen to counter it in time? How can employers and employees shape digital transformation together? How can digital skills and competencies be imparted and acquired in order to continue to ensure professional and social participation?

**Prof. Jörg Rocholl**

Ph.D., President, European School of Management and Technology (ESMT)

The transformation of the world of work through new technologies is creating great uncertainty, especially with regard to the demand for labor. While the fear that technological development will make jobs redundant on a large scale is controversial, it is clear that the impact of new technologies can be considerable. How can opportunities best be used in this situation, and possible negative consequences be cushioned? A meaningful and important alternative to the frequently discussed unconditional basic income is the reform of education systems, both in terms of education and training. For the common good, it is of great importance to improve educational opportunities extensively from early childhood to old age, thus enabling participation in economic progress and social exchange.

**Petra Mackroth**

Department Head, Department 2 "Family", German Federal Ministry for Family Affairs, Senior Citizens, Women, and Youth (BMFSFJ)

The German federal government has set itself the task of further strengthening families in Germany. To this end, the ability to find a balance between family and career, and care and career, is to be further improved. More and more mothers want to work more today – above all, with a view to their financial security – and more and more fathers want to reduce their working hours or make them more flexible. Companies and employers who adapt to this will become more attractive for women and men alike. One answer to dealing with this societal change is the concept of NEW balance. It aims to create a family-friendly corporate culture that enables women and men to organize their working hours in a family-friendly manner at various stages of their lives. Digitalization offers great opportunities here. Mobile and flexible working is easier to implement today than ever before, and makes it easier to find a balance between family and career. It is in the interest of employers and

employees to shape these change processes together and to guarantee security and development opportunities.

**Prof. Dr. Torsten Meireis**

Director, Berlin Institute for Public Theology (BIPT), Chair of Systematic Theology (Ethics and Hermeneutics), Humboldt University of Berlin

Digital transformation involves sweeping upheaval in the world of work and business, which brings with it a number of both opportunities and challenges. This upheaval is certainly not due to any law of nature, but to human initiatives and interests. For this reason, "Work and Industry 4.0" primarily implies the opportunity and the obligation to shape a change process driven by supply, technology, and politics in a meaningful way with the broadest possible participation of all those affected. From the perspective of a Christian understanding of business and profession, the character of work as a service to one's neighbor, the participation of all under humane conditions, and the empowerment of such a service are essential design criteria. Their application requires the adaptation of economic and social policies, collective regulations, with the social partners assuming responsibility, corporate cultures, and individual attitudes, which decide on and accompany necessary and meaningful changes in working time, place of work, training, security, and regulation.

**Alexander Gunkel**

Member of the Executive Board, Federal Association of German Employers' Associations

Digital transformation is increasingly penetrating the economy and thus also the world of work. It is crucial that companies, employees, and public administrations adapt to this and see digital transformation as an opportunity. Instead of relying on isolation and prevention and depriving the labor market of much-needed flexibility through additional regulation, we need to focus on how we can make work forward-look-

ing in the age of digitalization. Because the quality of work is one of the most important success factors for companies. In the past, German industry has repeatedly shown that it can make good use of economic upheavals. If we approach digital change with optimism and courage and focus on change, on innovation, on research and on the necessary qualification of our employees, we will also be able to master the current challenges in Germany and even profit from an additional digital return through the new opportunities.

### **Martin Ruess**

*Chairman of the Works Council, GE Energy Power Conversion*

Digital transformation and Industry 4.0 are changing work content, employment conditions and, in particular, the demands on training and professional development. It is now necessary to set the course so that new opportunities for good, qualified work open up for employees in Industry 4.0. Works councils and employees must be involved in shaping the working world of the future. We must take the floor here and shape tomorrow's employment conditions. Only then will we be able to realize the opportunities and counter the remaining risks. Appropriate strategies and implementation methods must be developed specifically for each company. This process requires openness from all stakeholders.

### **Tanja Böhm**

*Head of Microsoft Berlin and Corporate Affairs, Microsoft Berlin GmbH*

The use of artificial intelligence (AI) will lastingly change the way we work and generate (added) value. For the acceptance of AI and thus, in the medium term, for the economic success of German companies, it will be crucial to provide employees with offers for this transformation and to "bring them along," as well as to set the right course in the field of digital education. In addition, there is already a shortage of qualified specialist personnel today. Politicians must counter these and other developments as quickly as possible.



**Focus 3 –  
IT Security and Data Protection**

IT attacks, security gaps,  
and comfort –  
How do we ensure  
a high level of  
IT protection for our  
connected world?

## Cybersecurity & Data Protection – Public Security & Individual Freedom

by **Prof. Dr. Norbert Pohlmann**

Board Member for IT Security at eco Association

Too many security vulnerabilities and successful IT attacks; too few cybersecurity solutions and digital competencies.... How do we achieve a high level of IT protection for our modern and connected world, and what role do ethical standards play for individual freedom in this process?

The IT architectures of our IT systems today, such as those of end devices, servers, IoT devices, and network components, are exposed more and more to constantly changing attack and threat scenarios. The demands in the area of cybersecurity are increasing. In Germany, the damage incurred in the area of cybersecurity, at 55 billion Euro per year, is already too high and continues to grow steadily. We have to arm ourselves professionally against the damage and the new reality of cyber war and deploy significantly more effective cybersecurity solutions. Where do ethical issues come into play here?

Security is a fundamental human need. In 2015, the then German Federal Minister of the Interior, Hans-Peter Friedrich, even opened up a debate on a "superordinate fundamental right" to security. The term was used to justify state "security" measures which, although they may have been suitable for increasing security, were at the same time imposed at the expense of other fundamental rights, such as the right to freedom and privacy or data protection.

How do we deal with such a conception of security and its inherent understanding of state authority? In the face of cyber war and cyber crime threats, do we need full surveillance of citizens?

The fact is: 100 percent security can never be guaranteed – neither in the analog nor in the digital world. The fight for more security is a never-ending hare and tortoise race. Nevertheless, business, society and policy-makers must settle on an appropriate level of risk upon which we can build our future as a society. But just as leaving a car window open does nothing to increase security, unprotected IT systems and non-updated operating systems and applications are also unacceptable. However, leaving the window of your own car open already constitutes an offense in some countries. And yet the unpatched IT system on the Internet, which becomes part of a botnet, still does not.

Perhaps this is no bad thing, given that not all analogies of the real world with the digital one are prudent, but this does allow for a basic insight into the charged relationship between individual freedom and public security.

This tension finds a new dimension in the digital sphere. New technological possibilities offer state authorities and institutions, as well as organized crime, unprecedented opportunities to advance their respective interests. To make matters worse, IT and Internet technologies can also be regarded as "dual-use" technologies, i.e. an IT system or algorithm is neutral per se, and it is the context, application, or business case that raises ethical questions.

But even the belief that an algorithm is initially neutral is currently being debated – and perhaps even rightly so: if we look at the hosts of white, male developers and programmers, most of whom live in Europe or the USA, it should dawn on us that every human being who designs an algorithm could potentially feed his or her own bias into the system. So in the future, companies should pay more attention to the balance

and diversity of their development teams. The input data of algorithms that document knowledge and experience in a certain area also have an influence on the ensuing results. As such, knowledge about what data were used is very relevant for the evaluation of the results. If the input data contains prejudices and discriminatory views, the intelligent algorithms will also produce corresponding results. The crux of the matter is that today it is enormously difficult to monitor the input data for such prejudices, because a desired map of the defined values of a society would have to be available for these purposes, but it does not (yet) exist. But also the later decision-making of the business case at hand can represent a critical ethical turning point. Recently, a young start-up company in the field of social media monitoring cited its corporate philosophy as being, "We don't do everything we could do". This is the essence of ethical behavior, far removed from regulation. And this is where the two separate factors of cybersecurity and data protection intersect.

Profiling is technically possible, but it is fraught with difficulties from an ethics and data protection law perspective, especially since insecure IT systems never guarantee that the profiles are reliable, confidential, and trustworthy. A data leak, however, destroys the confidence of users (or even the business user industry in the SME segment) in the new technologies. A fatal signal in times of digital change – but also a crucial insight: Without IT security and trustworthiness, sustainable digitalization does not work!

Advancing digitalization is accompanied by many societal changes. Important in this change are common values on which we can rely. In the area of data protection, we in Europe have introduced the EU General Data Protection Regulation for all EU countries and providers from other countries who offer their services in the EU.

The majority of US Americans view the EU General Data Protection Regulation as a work based on more than 20 years of experience in

implementing ethical values which determine how we deal with the personal data of Internet users on the Internet.

Important aspects are:

- Right of access
- Right to erasure
- Right to rectification
- Right to restriction
- Right to portability
- Right to object

But even this regulation does not discharge us from our responsibility, as entrepreneurs or state actors, to act ethically and, apart from this broad framework, to place unethical behavior in the focus of our industry or political decisions.

**A further aspect to be considered is the topic of IT security:**

For society to accept and use IT technologies and services, they must be secure and trustworthy. Encryption, for example, is an effective and essential IT security mechanism. It reduces potential attack surfaces and provides appropriate protection for digital assets. This applies to the privacy of all citizens as well as to the protection of corporate assets. We need comprehensive encryption for the transmission and storage of digital information. To do this, we need secure and trustworthy encryption products that are easy to integrate and use.

This is particularly important in the field of communication. For the encryption of stored digital assets, the appropriate IT security infrastructures must be provided that meet companies' requirements in terms of availability. Encryption systems should also be increasingly used to protect intellectual property in the future.

This lies in the realm of the industry's obligations. But the state is also accountable: State-mandated vulnerabilities and backdoors reduce security for all citizens and companies, and at the same time destroy

confidence in increasingly important IT technologies and IT services. For a sustainable digitalization process, it is more important to protect digital values in the information and knowledge society than to enable potential access by secret services and law enforcement agencies through a general weakening of IT solutions.

IT products that have already been released on the market “insecurely,” or IT security features that are only offered or can be switched on or off at the user’s request, undermine the meaning and purpose of IT security. This must be avoided, because organized crime has just as much access to this vulnerability as the state, and it goes without saying that demanding ethical conduct from criminals is nonsensical. But this also means that all parties involved – the industry, the state, and society – must really pull together in order to achieve the highest possible level of security in the digitally connected world in the future.

New technologies such as artificial intelligence can help to achieve a higher level of IT security, but the use of artificial intelligence by criminal organizations can turn this completely on its head.

### **Artificial Intelligence in Support of Humans – Transparency, Trust & Decisions**

Internet services propose actions for users based on different types of sensors, such as wearables, smartphones, Internet services, etc. Intelligent algorithms use this huge amount of private sensor data, evaluate it, compare it with private data from other people, and employ general knowledge and experience to generate recommendations for action for users (see Fig. 2).

This can be very useful when it comes to making good decisions. Intelligent algorithms with copious amounts of data and almost unlimited computing power are an optimal complement to the individual human being with his or her personal knowledge, experience, and intuition. The basic prerequisite for the acceptance of AI is that society is able

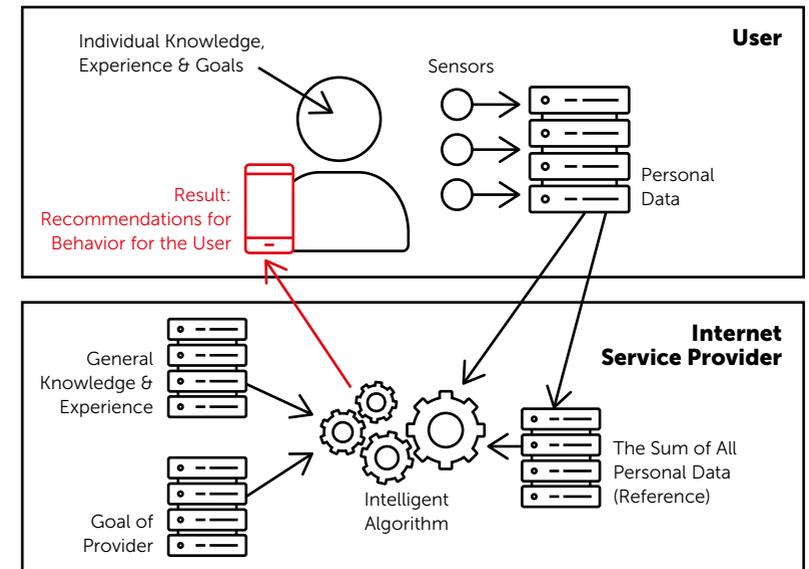


Fig. 2: Recommendations for users on the basis of intelligent algorithms

to trust it. To build trust, transparency is essential, and this includes the provision of basic knowledge about the functioning of AI systems and methods. This must become part of general public education. The fundamental requirement for the building of trust is the traceability of which data are generated and used, where AI is used, and how the AI functions.

For users of AI, it is important that the “Human in the Loop” model is drawn upon or, if this mechanism for regulation is not deployed, that an alternative is created for establishing the “rules of the game.”

In maintaining the requisite high level of knowledge and attention in this area, key activities include permanent awareness raising and information campaigns, employee training in companies, and early learning of the right tools for dealing with digital technologies.

We can only achieve greater security in the connected digital world by approaching it together – the journey towards this goal should be primarily motivated by the ethical drive of the actors, rather than through, e.g., laws and state requirements.

Education on aspects of IT security and data protection is key to this, and must be anchored in society as quickly as possible.

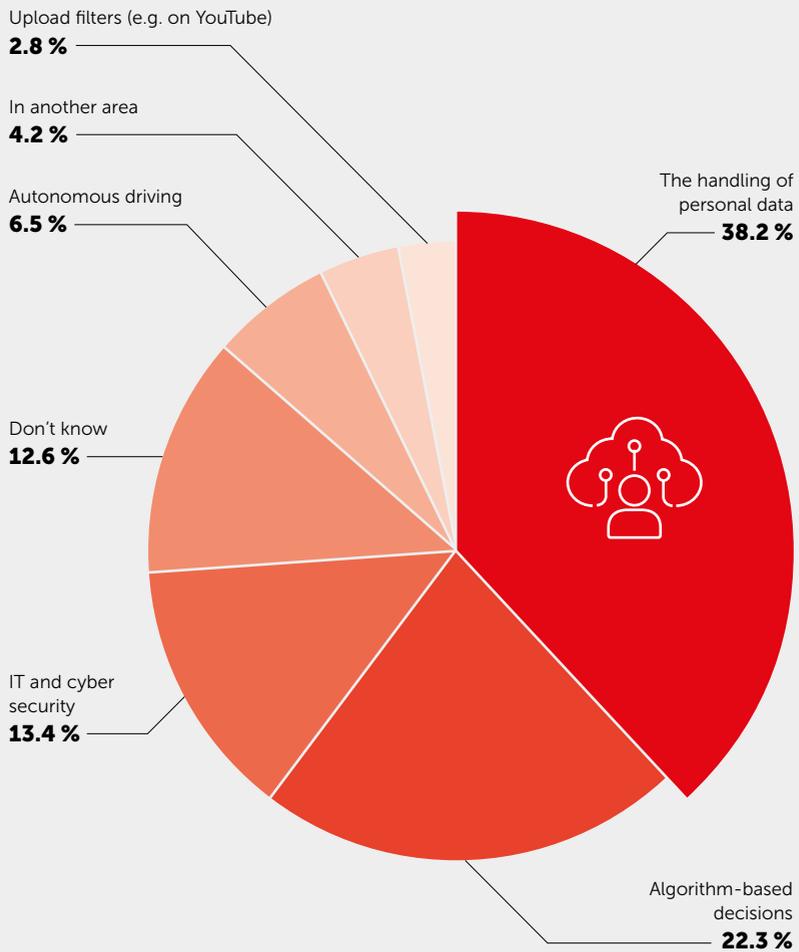
Issues of individual freedom and public security play a very important role for every citizen. A society whose economic and political ethos is based on the personal responsibility of the individual must reciprocally protect what makes the individual a social being and an economic factor: on the one hand his or her personal integrity and individual freedom, and on the other his or her material possessions. If we as a society are no longer in a position to fulfil these requirements, then we lose a part of democracy and give up our freedom.

It is important for us citizens to be aware that economic and political systems are not neutral. That is why it will be extremely important for us to remember that we as citizens are responsible for goals and their implementation in a society. While we have created a political system to manage that for us within a previously determined framework, unfortunately this system has distanced itself too much from the necessary freedom of citizens. The most important question in the long term will be how international society and its citizens can establish an economic and political system that will in future strike a very good balance between individual freedom and the security of all citizens. The Internet is an international infrastructure that makes new framework conditions necessary for governments, for global IT companies, and also for users.

## What does the German population think?

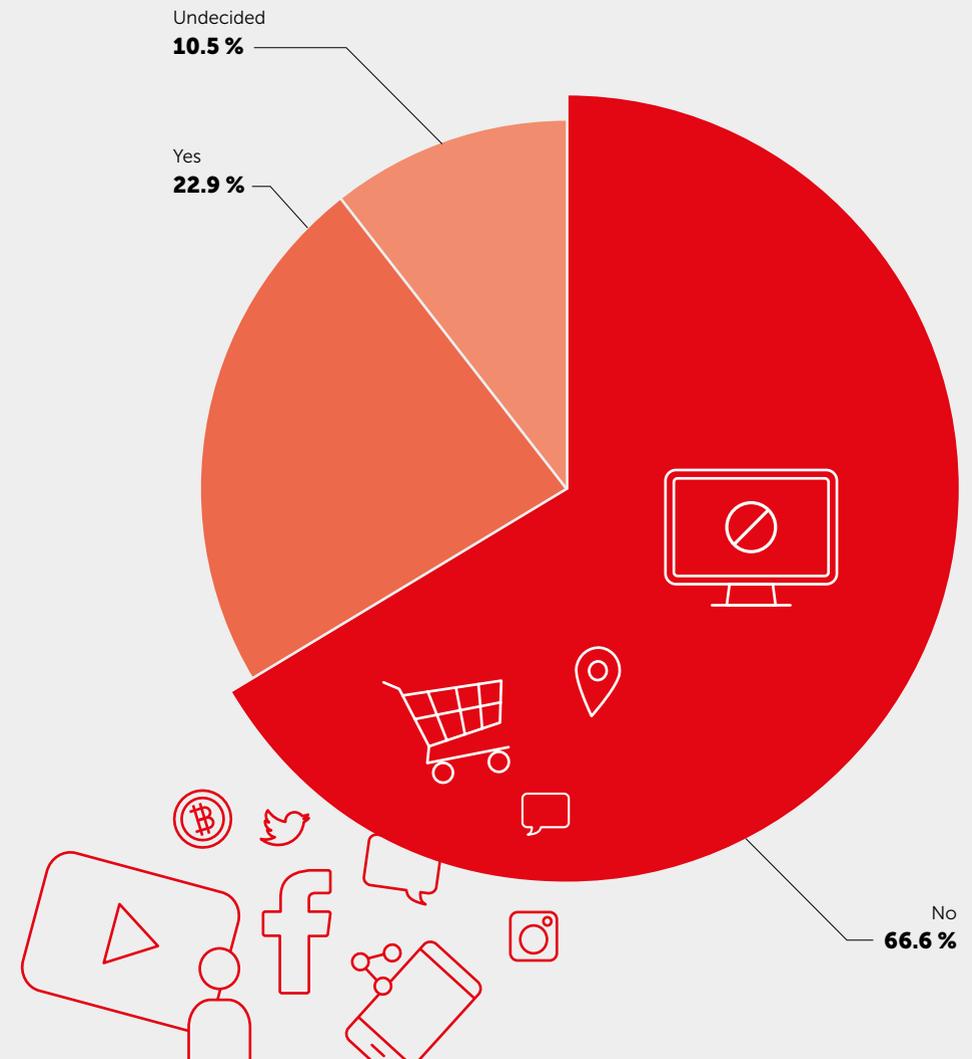
### In which area do you see the greatest need for ethical rules for the use of digital technologies?

Germans see great need for ethical rules in the areas of data protection, algorithms, and IT security.



### Would you provide anonymous data about your online behavior to further develop artificial intelligence?

The provision of personal data for the further development of AI technologies remains a major taboo for most German users.



## Expert Opinions

Every week, there are new reports of extensive IT attacks, security vulnerabilities, and data leaks. This makes it difficult to trust new applications, business models, and technologies. But instead of just naming the problems, efforts must be made to strengthen IT security at all levels and in all areas. While the public sector has created new institutions to counter cyber attacks, it also ensures that back doors remain open for secret services. How much and in what areas is IT security worth to us as a society? How much data security is still available for the “ordinary citizen” and what must or can we do ourselves to protect data from unauthorized commercial use or foreign data collectors? How do we come together to achieve these goals? And which players have the opportunity to create more security in the digital world?

### **Prof. Dr. Georg Rainer Hofmann**

Director of the “Information Management Institute (IMI)” at the University of Applied Sciences Aschaffenburg and Head of the Competence Group E-Commerce of the eco Association

The systems of “artificial intelligence” demand a new anthropocentric orientation. Hawking’s 2001 warning addresses a new type of machine; “Computers will be more intelligent than humans, so there is a danger that devices will develop their own intelligence and dominate the world.” Fears are expressed that machine artificial intelligence (AI) will in the foreseeable future be superior to humans and that the economy and society will be normatively dominated by machines – in an imperium computatrum. The question of whether these fears rightly exist and where the role of anthropocentric ethics can be seen leads to the métier of both information management and epistemology. It is indeed necessary to warn of some phenomena and the real dangers of senseless automation. Social anthropocentrism must counter dominance through pointless or immature processes and machines in a non-normative manner.

Read more: G. R. Hofmann: „Impulse nicht normativer-Ethik für die Ökonomie“, Nomos-Verlag, 2018.

### **Manfred Baer**

Vice President & Partner, Head of Public Sector Consulting Germany, Austria, Switzerland; IBM Deutschland GmbH

If digital transformation is to be a success in Germany, IT security and data protection must be the basis of everything we do. Transparency and security are the order of the day! Cyber crime is growing dramatically fast. The damage caused by cyber attacks goes far beyond the obvious monetary damage to people, companies, and customers, with IBM predicting that cyber crime will cost the global economy more than two trillion dollars by 2019. Cyber attacks also have a decisive influence on the reputation of and trust of customers and citizens in digital

transformation. We must therefore ensure that IT security is not only taken very seriously, but that sufficient resources are also available and continuously implemented. IT security must be developed and implemented in a way comparable to the human immune system. It has to learn to cope with new attacks every day. The latest security technology combined with artificial intelligence can do just this!

Citizens must also be in the position of knowing who has access to their data at all times and being able to give their consent if it is to be shared and used. The IT industry also provides the tools and techniques to create data protection and anonymization. We can only create trust if data protection is comprehensively safeguarded by the state and if citizens' data is used for the right purposes. Only then will digitalization be accepted across society!

#### **Daniel Hartert**

Chairman of the Board of Management of Bayer Business Services GmbH; CIO, Bayer AG

IT and data security are fundamental prerequisites for entrepreneurial success and are therefore a shared task. In the face of increasing and complex attacks on enterprise systems, commercial enterprises must cooperate even more closely than before with each other and with government organizations. The foundation of the German Cyber Security Organization (DCSO) shows how this can be achieved in practice. The competence center works as the preferred cyber security service provider for the German economy and makes an important contribution to coping with the growing cyber threats in an interconnected world.

#### **Prof. Dr. Michael Ronellenfitsch**

Data Protection Commissioner for the German federal state of Hesse

Data protection was originally protection against state interference in the privacy of personal data. Today, data protection is about protecting

self-determined data traffic with such data. Data traffic must be secure and must not be limited to a revitalization of the old understanding of data protection.

#### **Dr. Gerhard Schabhüser**

Vice-President, German Federal Office for Information Security (BSI)

Information security must be ensured when using IT and all digital services/offers. This means the continuous guarantee of data security and data protection (privacy). In the eyes of the Federal Office for Information Security (BSI), the creation of information security is thus the necessary condition for the success of digitalization.

#### **Dr. Hannah Schepers**

Assessor, Catholic German Women's Federation Diocesan Association Berlin

Data security is a cross-sectional issue that requires joint efforts by policy-makers, civil society, academia, and business. It is important to integrate the wealth of perspectives of a society into dealing with data security. This is because data security on the Internet affects almost everyone, across generations and gender boundaries. That is why it is important to involve everyone and at the same time think about the technical, political, ethical, and social dimensions of data security. Only in this way can we encourage people to take advantage of the opportunities offered by digital transformation, enable digital participation and, above all, avoid a digital divide in society. This includes enabling as many people as possible to act responsibly on the Internet and to impart digital skills for all phases of their lives. And to establish a culture of information and discussion that provides reliable answers to open questions and provides orientation. Data security online requires not only political and technical framework conditions, but also the self-confidence of each individual in using the Internet.

**Malte Spitz**

Author, activist, and data protector

We need to stop focusing on convenience and prioritize the security of our data and information technology. Whether for networked devices in the home or work in the office, we need to strengthen data and IT security and apply it effectively in everyday life. This requires support to be offered at all levels so that people themselves can push and promote this protection. And we need politicians who promote IT security as the first priority and do not undermine it with demands and subsidies for backdoors in software and hardware.

## How Far Should the State Be Allowed to Go for the Purposes of Digital Security? On responsibility for IT security

by **Klaus Landefeld**

Vice-Chair of the eco Board

The hacks and security vulnerabilities of the year 2018 made it abundantly clear: Neither the current IT products, operating systems and services, nor cyber space itself currently offer sufficient protection against the diverse threats of a digitalized world. Despite what can be seen objectively as myriad improvements and stepped-up efforts by manufacturers, the situation is perceived to be worse than ever – a perception which can be attributed, at least in part, to increased media attention.

As society becomes more and more digital, increasing volumes of private and personal data are being inexorably transferred into cyber space, either with voluntary consent, or also sometimes involuntarily. This occurs, for example, on the basis of our own activities in transferring private communication into message groups or cloud backups, through IoT devices, through e-health activities such as the health card or electronic patient files, and not least, through e-government activities such as online administration or the online submission of tax declarations.

Unfortunately, as it appears, neither private companies nor public administrations are currently equipped to store and manage our data securely and reliably. It is of the utmost importance that the security level of IT systems, solutions, and services be immediately and significantly increased in a consistent and sustainable manner, as must the

protection level of data transmission, and that appropriate protective measures such as consistent data encryption are brought into play. Of course, it is true that many attacks are only enabled by the careless handling of users' access data and the neglect of even the most elementary security precautions – the digital equivalent of the open front door, so to speak, with the briefcase located in the entrance hall. However, while user training and a heightened awareness of problems, especially with regard to the significance and security of one's own digital data, are important and necessary, the everyday use of digital life's basic components must also be fundamentally secure for the clueless user. To expect all users to understand the function, structure, and interaction of systems and applications, and that every user will become a cyber expert, is simply unrealistic – rather, the use and operation of secure, encrypted systems must be made as simple as child's play, to enable even the inexperienced user to manage their data securely in the digital world.

Similar requirements must be met in the area of targeted data alteration and the uploading of false or inaccurate data, which form the basis not just of insurance company assessments and trading platforms' economic positions, but also of influencing and opinion-forming in social networks or similar platforms – here, in the absence of tried and tested methods, the door is still wide open to abuse. The development of countermeasures is often still at a very early stage and usually requires elaborate, partly AI-supported systems in order to be effective. Here, too, it must be possible in the medium-term for the individual user to know the source of the data and to carry out a control, a "fact check" of the data presented, at least in principle.

There is a political trend towards shifting the responsibility for even the most elementary of state tasks to the private sector and to want to hold the operators alone accountable (mostly on a pre-emptive basis) for not only the security, integrity, and authenticity of data, but also for assessing the legality of a use. This tendency clashes in practice with the

simultaneous demands of stringent data protection, absolute protection of privacy, and the data sovereignty of users.

At this juncture, the state will have to decide which tasks and priorities it should assume responsibility for in a digital society, and when the needs of all citizens in cyber space justify or even require a restriction of state action.

The present demand for secure systems, applications, and networks, as well as a consistent increase in system security, conflicts with the steady expansion of state control in all areas of the Internet and, in particular, with the call for security authorities to exert more rights in the digital world. In an increasingly interwoven system of access rights and access possibilities, access to digital data is regarded not just as the sole remedy for combating what is perceived as "Internet crime," but also for the investigation of all forms of crime and the "protection of national security". If one then leaves the boundaries of national law – as would currently be the case in line with the European Commission's draft regulations on so-called "e-evidence" – user data will be tossed around by a multitude of national legislations that have not been harmonized to even a rudimentary degree, without users being given suitable legal redress in return.

These demands for universal access for the security authorities are contraindicative and actually stand in the way of protecting the population in cyber space. Practically all of these access options require a weakening even of the existing, mostly insufficient protective measures of services and applications, as well as a delayed closing of known security vulnerabilities. The inescapable fact is that each of the forced vulnerabilities in the overall system that can be exploited by the security authorities is also an open door for cyber criminals and attackers from all over the world, and thus poses a threat to the security of the population as a whole.

To return to the question of priorities: Shouldn't the protection of the population and companies in general be the primary protection goal of state actors – and even be a state goal? Any threat from existing vulnerabilities is concrete, tangible, and above all avoidable. Such threats affect every citizen and every company in their daily application, unlike the indeterminate danger impelling the pursuit of criminal elements or groups and actors that undermine the state.

In investigating criminal activities or going after terrorist groups, the problems therefore need to be weighed up and measured against the everyday dangers that threaten each individual in the daily use of IT systems, and this needs to happen as long as no consistent, government-sponsored measures are taken to increase IT security.

Government activities such as those in Australia, for example, where a new law provides for a state right to permanently weaken encryption and where access to all equipment can be enforced through obligating the manufacturers, must therefore be viewed with concern. In Germany, too, one gets the impression that – in a kind of race to achieve the most far-reaching police law – a maximum weakening of the security of users and companies is not only being tolerated with eyes wide open, but also is being tacitly endorsed.

Such activities, however, weaken cyber security to a point where legal entities and natural persons are endangered by the state to such an extent that the activities of the state itself can and will only be seen as a threat.

Unfortunately, this situation is not new, and is already familiar from the field of secret services, where all the rules of the game and laws on data protection and the protection of the privacy of one's own citizens and companies are regularly circumvented or deliberately broken – partly by applying risky legal constructions. On more than one occasion, the tools developed to these ends later ended up in the hands of criminals

and became a global threat to cyber security – and this trend is growing.

In a world in which the boundaries between the actions of criminals or terrorists, abstract cyber threats by "state actors", and the current or at least desired actions of the state's own security authorities continue to merge (indeed, become virtually indistinguishable for the user), we must ask ourselves the question: Where does a "threat" actually begin? Which activities and actions define a criminal and which define a terrorist – or, in the abstract, a "danger"? Where are the boundaries between a legitimate action of security authorities for the good of the population or "national security" on the one hand, and crime and terrorism on the other, in a world in which neither the tools and methods are distinguishable, nor in which states in cyber space restrict themselves to their national territory or their national laws?

Thus, the defenders on the one side quickly become the (cyber) terrorists on the other, "hack backs" become attacks, laws to strengthen national security become a danger to our democracy, and measures to combat crime become the greatest threat of all to security in cyber space.



**Focus 4 –  
Smart City & Sustainability**

Digitalization and  
sustainability:  
Are today's "smart city"  
and "smart rural area"  
concepts really smart?

## Sustainable Digitalization in the Smart City

by **Harald Summa**

CEO, *eco* – Association of the Internet Industry

Over the past 100 years, humanity has used up the resources of its (so far) only inhabited planet at a breathtaking rate. At the same time, the world's population is constantly growing. By the year 2040 it will double to over 9 billion people compared to 1980.

One characteristic of this development is continuous urbanization. From the global south to the global north, more and more people are moving from the countryside to the big cities: in 2009, 3.3 billion people were living in cities: for the first time, this was more than were living in rural areas. This is not only causing serious growing pains in the explosively growing metropolises of the global south and the future megacities. The conurbations of the old world also face considerable ethical challenges.

However, at least in terms of sustainability, urbanization is now seen as an opportunity. In 2014, the Intergovernmental Panel on Climate Change (IPCC) determined that efforts to reduce greenhouse gas emissions in urban areas represent decisive leverage for international climate and energy policy. According to the well-known Brazilian urban planner and mayor Jaime Lerner; "The city is not the problem. The city is the solution." The form, infrastructure, consumption styles, planning strategies, and cross-sectoral policy instruments of a city can be aligned particularly effectively with one another through economies of scale.

Cities are much more effective in organizing the distribution of goods and work routes or in providing education and culture than are settlements scattered over a large area. The current standard of living in

cities can therefore be achieved more sustainably and with less natural resource consumption than in rural areas. This also applies to social facilities and medical care. These effects can potentially be multiplied in conjunction with ethically oriented digitalization.

In order to earn the title "sustainable," however, our cities must undergo fundamental change. So far, the urbanization dividend has been invested in rising living standards while simultaneously increasing the consumption of natural resources. An obvious example of this is the organization of transport. Although the further increase in motorized individual transport makes it possible to get from A to B faster and more comfortably, collateral damage such as congestion, noise, health-threatening emissions, and the allocation of public space to traffic requirements means that a considerable proportion of the progress made in urban quality of life is lost. This trend must be reversed by means of a sustainable municipal policy.

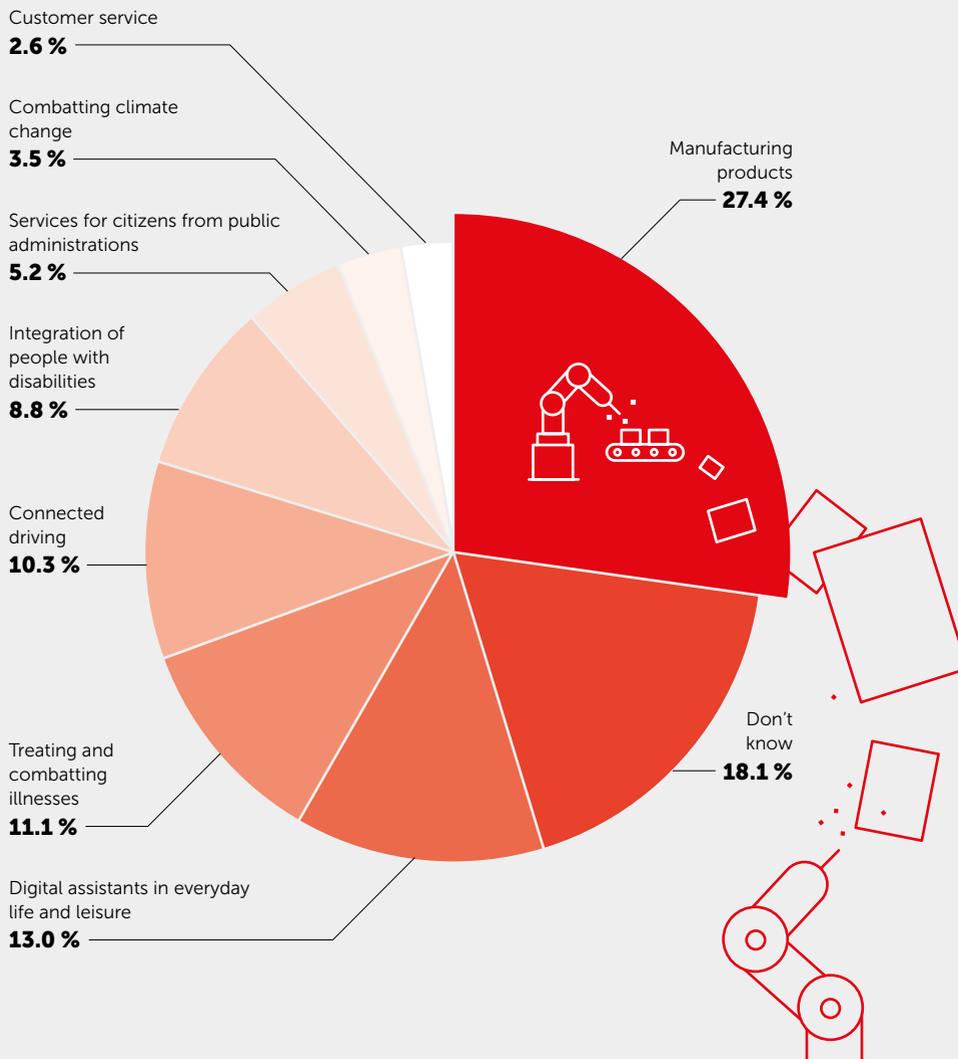
Smart city concepts offer answers to the challenges of urbanization. Smart cities provide forward-looking concepts for increasing efficiency and achieving economies of scale. They make it possible to reduce the consumption of resources and at the same time increase the quality of life. For the people in the city, this is not only about prosperity and mobility, but also about the social coexistence of an ageing population, a healthy environment, and climate protection, as well as affordable living space. The smart city offers a wealth of approaches for sustainable municipal policy.

The Hanseatic City of Hamburg, for example, has equipped 11,000 parking spaces in public spaces and multi-level car parks with sensors that navigate drivers via an app directly to the nearest available parking space. Unnecessary traffic resulting from the search for a parking space, with corresponding negative environmental effects, is thus avoided. In addition, the car park can be booked directly with the app and paid for digitally.

## What does the German population think?

### In which of the following areas do you think there will be the greatest advantages from using artificial intelligence?

The majority of people are not yet convinced of the value of smart technologies in everyday usage.



Public transport will also change considerably – and not only in the big cities. In the Bavarian health resort of Bad Birnbach, there is already a self-propelled electric bus between the market square and the Rotal-Terme thermal spa. The bus for up to six passengers operated by Deutsche Bahn runs every 30 minutes and is being tested as a future means of transport. In the next step, the smart city, such a bus fleet will be controlled according to demand, and will be on the road where and when required, as passengers register via their smartphone. Just as today digitalization makes it possible to watch on demand instead of the linear television program, public transport will also operate on demand in the future instead of serving lines. In this way, the smart city combines the advantages of the motorized individual transport with the sustainability of public transport.

In addition to transport and logistics, the greatest potential is seen in the area of supply and disposal. Since 2018, the technology group Siemens has been developing a fully digitized, sustainable, and decentralized energy system for the Upper Franconian district town of Wunsiedel. In the future, the supply network for Wunsiedel is to be fed 100 percent from renewable energies, and is to be semi-autonomous, and capable of a black start. All elements of energy generation are to be linked via sector coupling in order to make optimum use of them. Following investments in power and heat generation, storage, control technology, and energy efficiency, a power-to-gas or power-to-liquid plant is planned. By means of a pooling solution consisting of battery storage and electrolyzer, the public utilities of the municipality want to earn additional money on the energy balancing market in the future.

In Cologne and Stuttgart, the waste management company Remondis is currently testing a system for the efficient control of glass recycling. The glass containers distributed throughout the city use sensors to report the fill level to the headquarters. As a result, the collection vehicle no longer drives to empty containers. Citizens no longer have to worry about overfilled glass containers. This sustainable smart city solution

reduces emissions and protects the environment.

These examples show: There are hardly any limits to the imagination in which urban areas the smart city can achieve sustainable effects. In the healthcare sector, the digital patient file and personal health management are revolutionary innovations of an ethically oriented digitalization. The ageing population will also increasingly benefit from smart care solutions, as demonstrated by the Smart Service Power smart care project supported by eco. Mobile health devices such as digital blood glucose meters are already available today and make diagnosis easier.

Many areas such as the digitization of educational institutions are still in their infancy. This is why, according to the study "The German Smart City Market 2017-2022. Facts and Figures" published by the eco Association and Arthur D. Little, the education market segment within the smart city will grow particularly strongly with an annual growth rate of around 27 percent.

In fact, the smart city market is one of the fastest growing markets in the world, and this is also happening in Germany, as the study forecasts. Sales generated with smart city solutions are expected to more than double between 2017 and 2022 to around 43.8 billion euros – equivalent to average annual growth of 16.5 percent. This market is highly interesting both for the Internet industry and for companies in other branches of industry.

In order to be successful in mega-projects that are already being carried out internationally, the export-oriented German economy must be able to demonstrate reference projects for corresponding products and services. Companies from different sectors must work together in the smart city ecosystem and proactively strive for cooperation.

In addition to the first existing smart city examples in German cities mentioned above, many more successful implementations will there-

fore be needed in the coming years. The research and innovation agenda for the future city initiated by the German federal government in 2012 could be one approach in this regard. It gave rise to the Future City competition of the German Federal Ministry of Education and Research (BMBF). Together with citizens, academia, local politics, industry, and public administration, it is intended to help 51 cities, municipalities, and rural districts develop holistic and sustainable visions that will be implemented in real laboratories and tested in practice from 2018 onwards. It remains to be seen whether the enormous potential of sustainable smart city concepts will actually be sufficiently promoted in this long-term process.

If German cities are to rise to the position of leading smart cities internationally in the coming years, they must adopt a holistic approach and implement it without too much delay. This requires finding a coherent strategy that integrates the multitude of different smart city offerings from mobility and energy management through to security solutions with a cross-segment smart city platform as the link between all services. Given the enormous ethical importance of the question of how we shape our cities of the future, this sustainable approach must not be allowed to fizzle out in endless rounds of talks and workshops, but must now be swiftly put into practice by committed decision-makers. Time is of the essence.

## Expert Opinions

The city and the village of the future are currently taking on a completely new dimension, with the vision driven primarily by industry. Equipped with a digital infrastructure and the movement data of their citizens, they manage almost all areas of public life: from intelligent traffic and parking systems, through to sensors in rubbish bins and street lamps, and on to Smart Living and opportunities for digital participation. In brief: One side of the coin is that digitalization offers many opportunities to make cities and rural regions efficient, livable, and safe.

On the other hand, dangers and risks are also emerging: higher resource consumption through greater mobility, the cementing of social inequalities and the digital divide between urban and rural, old and young, and the increasing control and monitoring of public life. The intelligent networking of the direct living environment requires a high level of trust, since it is no longer possible to withdraw from it.

In public debates, the topic of Smart City and Smart Rural Area has so far been dominated almost exclusively by the technical possibilities of digitalization, which are based on current business models. Against this backdrop, digital transformation requires more than ever precise political management, and discussion of needs from the perspective of the people in these places, but also of the question of changes in the application of technologies, e.g. in order to plan new models of living between rural and urban areas, or completely new forms of private and public mobility. So how should digitalization in cities and rural areas be designed for society, so that citizens really benefit?

### **Dr. Robert Franke**

*Head, Office for Economic Development of the City of Dresden*

Dresden is the heart of Silicon Saxony, Europe's largest microelectronics cluster and one of the most innovative information and communication technology (ICT) clusters in the world. With the expansion of its hardware competence to include software and connectivity, Dresden intends to form a new German Smart Systems Hub to offer future-oriented applications in the areas of mobility and the Internet of Things worldwide. In 2017, Dresden initiated the next phase with the help of a strong contribution from industry – such as the two billion-dollar investments by Bosch and Globalfoundries, and the strategic establishment of Volkswagen's "Center of Future Mobility" in Dresden.

### **Prof. Dr. Stephan Rammler**

Institute for Transportation Design, Braunschweig University of Art

Digitalization offers new possibilities for the design of life in urban and rural regions. There are growing problems in both worlds. While cities suffer from density stress and the associated demands this places on the health of inhabitants, along with causing economic challenges, in rural areas, demographic change is leading to challenges in maintaining financially viable public services at all. In both worlds, digital options, and market forms in combination with new lifestyles could make a contribution to securing the future. However, opportunities and risks, demands and reality often vary considerably. Not every Smart City concept is – despite all technological intelligence – a clever solution from a socio-political point of view. This debate must be conducted and integrated into infrastructure and regulatory concepts to secure the future of our cities and regions.

### **Andreas Richter**

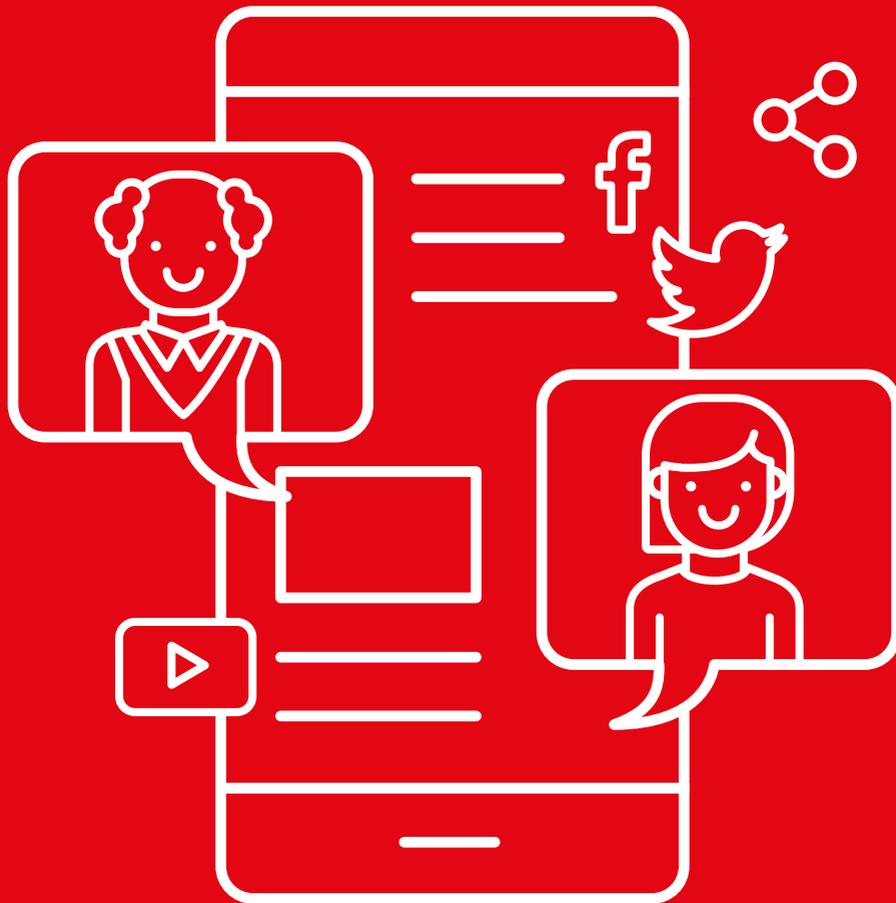
Director and General Manager, Honda Research Institute Europe

When do we perceive people, customers, users of a device, a system, or an organization really as “smart” in the sense of intelligent? Only if they meet our expectations and thus enable us to achieve our goals and or satisfy our needs in the real world more easily, in a more relaxed way, with less effort, and with fewer resources. Digitalization is often a necessary condition for smart solutions, unfortunately – in itself, it is not sufficient. From our perspective, two important aspects that should be taken into account in design and development are that the focus is on people and not on technology, and the consideration of the impact of scale and robustness in connected systems. Trust and thus acceptance arise when a direct material or ideational benefit can be experienced, without limiting self-determination and self-efficacy. This is why we place the “Cooperative Intelligence” approach above that of purely autonomous systems.

### **Matthias Spielkamp**

Executive Director, AlgorithmWatch

Talk of the “Smart City” is ubiquitous. The idea of an intelligent urban space has become so commonplace that one might think there is agreement on the concept. On the contrary: The term is so vague that it can be used by all interested parties – and that is exactly what makes it so appealing, say critics and supporters alike. The idea of the “Smart City” in its present form comes from companies such as IBM, Cisco, and others, but not from actors who are recognized for their contributions to the theory or practice of urban planning, according to Adam Greenfield, author of the book “Against the smart city (The city is here for you to use)”. If it were to be allowed, he argues, we would face a dystopia of surveillance and heteronomy. Advocates of the “Smart City” see great potential for improving quality of life in cities – through better traffic management (less congestion!), more convenience (no more waiting at government offices!), and better information in all circumstances. It is time to leave the “Smart City” behind us and come up with ideas for the good city.



**Focus 5 –  
Education & Competencies**

How can “young and old” gain essential digital competencies, so that everyone can live and act in a self-determined manner?

## Digital Education as the Foundation of Digital Ethics in the Interconnected World

by **Alexander Rabe**

Managing Director, *eco* – Association of the Internet Industry

Anyone who is looking for a definition of the term “education” can find one quickly and easily in the Internet, for example on Wikipedia.

One characteristic of education according to Humboldt’s educational ideal – which can be found in almost all modern educational theories – can be paraphrased as the reflective relationship to one’s self, to others, and to the world. What might this mean when it comes to digital transformation, which has been increasingly shaping our lives for the last two decades and will continue to do so in the coming years? Essentially, it suggests that an informed, aware, and critical – and ultimately also ethical – interaction with Internet technologies should already long ago have flowed into our general educational canon.

But are users of this Internet technology already sufficiently educated – in the sense of the capacity for a reflective relationship to themselves, to others, and to the world – about the retrieval of information?

School pupils – our Digital Natives – have already been acquainted with Internet technologies from early childhood, mostly in the course of entertainment, communication, or the search for information. For many, this interaction with the new technologies appears to already answer the question of whether we need digital education, because the need seems to be addressed through usage and the acquisition of new skills, and an apparent problem seems to be solving itself.

But knowledge about fast access to information and knowledge does not replace Humboldt’s classical educational ideal as described above. On the contrary, to be able to create a reflective relationship to one’s self, to others, and to the world, it is necessary in a digitally connected world for the underlying technical and social-societal mechanisms to be understood.

So, what is needed in education, in order to develop a holistic understanding of these technologies? And what does a holistic understanding even mean?

The German Society for Informatics (GI), a strategic cooperation partner of the *eco* Association, has identified the following aspects:

“Education in the digitally connected world (in short: digital education) must be viewed from the technological, societal-cultural, and application-oriented perspectives.

A self-contained field of learning must be established, which enables the acquisition of fundamental concepts and competencies for orientation in the digitally connected world.

Alongside this, it is the task of all subjects to integrate the subject-specific references to digital education.

Digital education, both in the independent field of learning and within other subjects, must occur continuously across all school levels for all pupils in the sense of a spiral curriculum.

Appropriately solid teacher training in the related fields of Computer Science and Media Education is indispensable for this. This means:

- a. An independent discipline must be established as part of teacher education degrees, which covers content from Computer Science and Media Education in equal measure.

- b. The teaching methodology of all subjects and of education science must rise to the challenge and further develop research and concepts for digital education.
- c. Comprehensive further education and professional development offers for teachers with technological, societal-cultural, and application-oriented perspectives must be established in the near term." (GI, 2016)

These insights were developed together with industry on the part of the largest academically-driven association of and for computer scientists in the German-speaking world. They serve to describe the path towards digital education – and thus towards understanding and reflection – as well as the charged relationship between technology and pedagogics or didactics.

The German federal government is attempting to start at this point with their Digital Pact School, and to finance the technical equipment of the schools through a change in the constitution. At the same time, on a content level, the conference of the state education ministers is to organize the training and professional development of teachers and above all to codify curriculum frameworks that define the necessary digital competencies of pupils in Germany.

Establishing these capabilities for teachers and pupils and at the same time enabling the simple access to Internet technologies are the prerequisites for the competence to use these systems responsibly, to understand them, and to approach them critically. In the end, the responsible citizen exists in a digitally connected world. And only then can we speak in a reasoned way about ethics in a digitally connected world, because it is only when the technical systems and their implications are intelligible that they can be assessed and evaluated.

As such, it is only when this has happened that a code of ethics for the digital sphere will even be possible.

### **Why do we even need such a code of "ethics" – what would distinguish it?**

The much discussed – and somewhat disruptive – change, the digital transformation of industry and society, is causing many people to be afraid. Today, we have no broadly known ethical rules in the digital world, not on the part of the companies, nor the developers, nor the users. While this might make the Internet appear to be like the Wild West for many, on closer inspection, this comparison is not valid. Rather, there are parallels to the beginning of the industrial age, at the end of the 19th and beginning of the 20th century. Like back then, our society sees itself confronted with new technologies, new business models are emerging, and corresponding to this, new job profiles are emerging in industry. Jobs and existences are being endangered and fears are arising that often distract from the potential and the new perspectives that are emerging.

Similar to back then, we must enable people to participate in this digital transformation to help shape it. A framework needs to develop which, alongside regulation, has its foundation in an ethical consensus. But where should this ethical consensus come from?

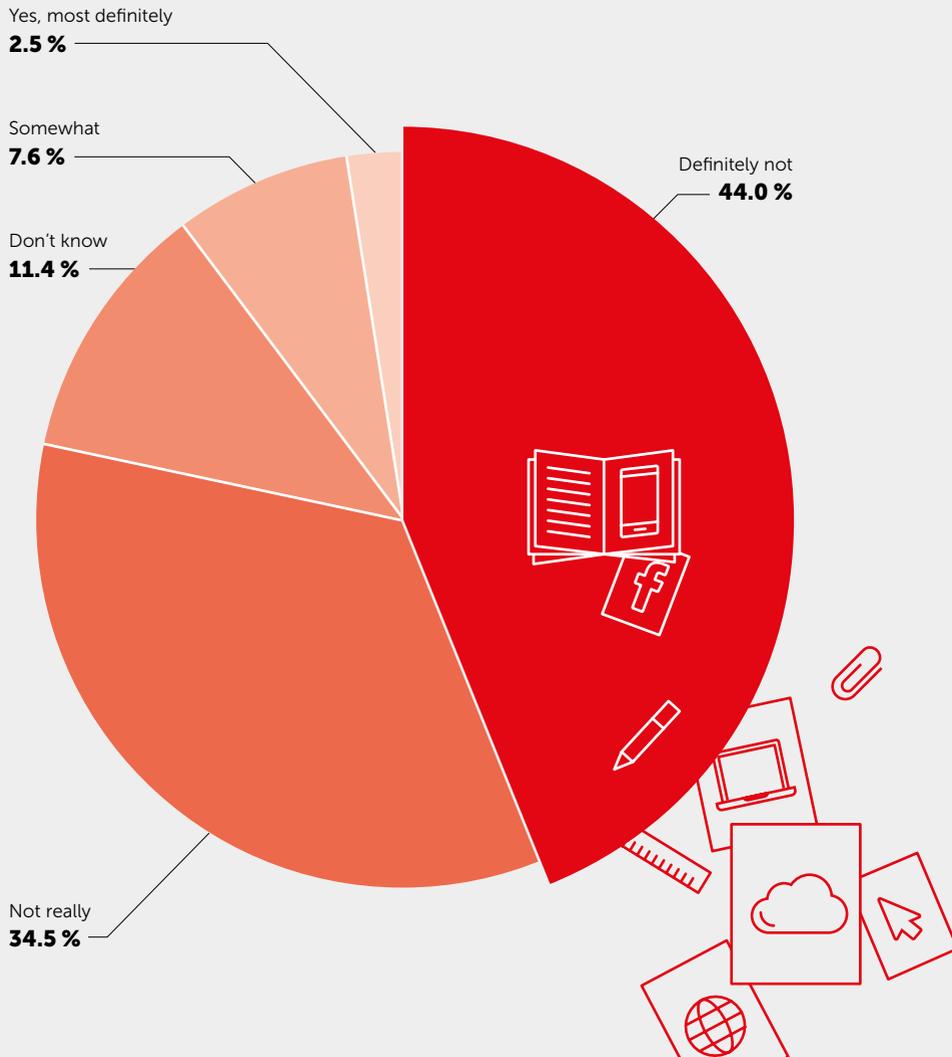
Back then, Physics was introduced as a compulsory subject in German schools. The industry had recognized the need for specialists, and needed to make a basic understanding of the fundamental skills a prerequisite of school leavers, so that on the basis of this school knowledge, the workers could be appropriately trained in companies. The engineering profession thus developed, and Germany as an industry location is still proud of this achievement, because society had learned how to benefit from such a technological revolution and make it a model of success.

And this is exactly where we find ourselves again at the beginning of the 21st century.

## What does the German population think?

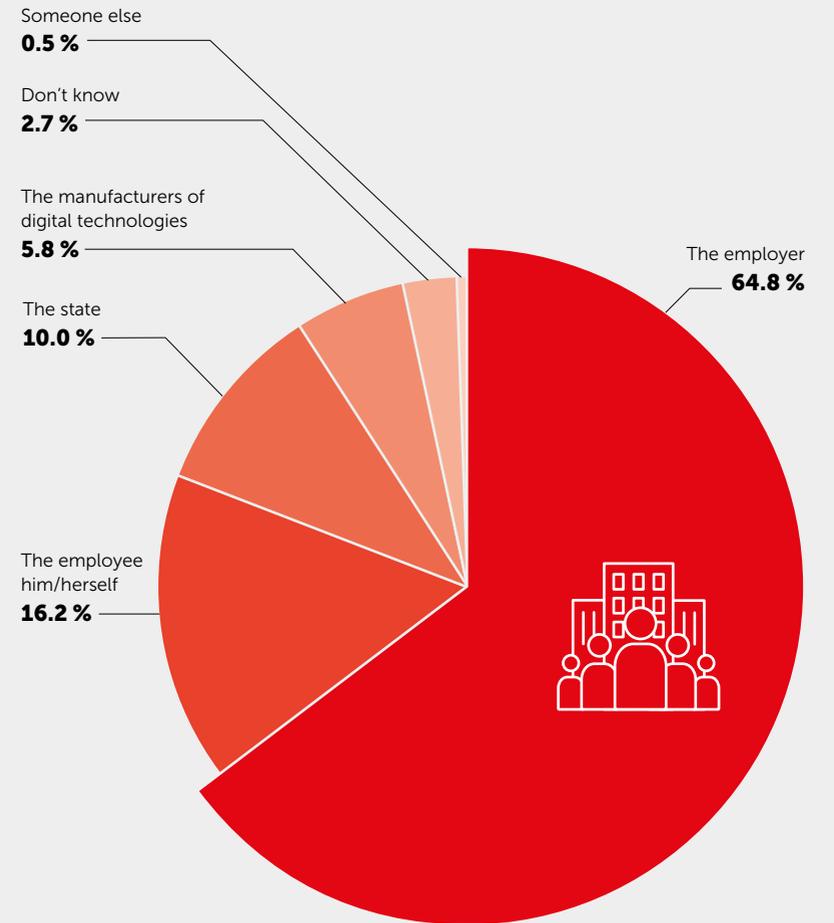
### Does the German education system prepare pupils sufficiently for the digital future?

Around 80 % of Germans see major shortcomings in the current education system in the area of digital competencies.



### Who should be primarily responsible for ensuring that employees can gain sufficient professional development in a digital working world?

The majority of the German population sees that major responsibility for professional development in the area of digitalization as lying in the hands of employers.



A basic understanding of programming, algorithmic decision logic, and the structure of data bases are essential prerequisites to understand how digital transformation is to be used and shaped, what possibilities and potential a click in the Internet offers, but also what cascades can be triggered and what business models may lie behind them.

Not every pupil needs to become a programmer or computer scientist, but all school graduates need to have understood the logic of digital transformation, in order to be able to make decisions competently, and perform adequately in their later professions. With an understanding of the functionalities and mechanisms of new digital technologies, the skepticism and anxiety regarding them will disappear almost automatically.

Only with the relevant knowledge can the sense behind data protection be explored; only then can IT security be lived and learned. Only then can we really talk about responsible users acting in the digital world. Only then will new specializations and a digital elite develop, who will drive forward Germany and Europe with their new business models and innovative products, and secure our existing industrial strengths through sound knowledge of digital processes.

And only then can we validly demand ethical behavior. Those who understand the interrelationships can also act responsibly. This is the responsibility of society, industry, and politics alike.

### **What is needed to achieve this?**

Digital competence can be taught to children playfully early on in school life. Here, we are not talking about “media competence” – although this is also important – but the logic of digitalization itself. Whether this requires its own compulsory subject, or this logic can be embedded in the existing curriculum, for example, in Physics, Biology, and Chemistry, is a question for the ministers of education, the schools, and ultimately the teachers. There is much to be said for both models:

A solid integration into the curriculum as a compulsory subject would certainly have the advantage that specialist teachers would need to be trained, and they would then also have specific requirements to fulfill in the curriculum framework.

In current teacher training, however, these capabilities are not yet being sufficiently taken into account. This means that even the youngest generation of teachers will be entering classrooms without requisite digital tools, without a didactic concept, and as of today in many locations, without a curriculum framework that stipulates how this might proceed, let alone how to teach “Ethics” in a digitally connected world in its diverse dimensions.

### **We are losing far too much time**

The current proposal by the German Federal Ministry of Education to provide 5 billion Euro from the Digital Pact School is right and important, but it’s only a drop in the ocean, given that it is ultimately only about the hardware equipment and broadband Internet connections in schools, and perhaps also Wi-Fi in classrooms. The technical servicing and maintenance of the systems is yet again not being sufficiently sustainably subsidized. Here, the shortsightedness of the approach should be singled out for particularly strong criticism. There were many instances in Germany in 2018 in which smart boards were dismantled, and the classroom re-entered the chalk age.

This shows that digitalization must be a holistic process that brings all staff from all levels of public administration along with it. The staff of state institutions like schools, vocational schools, or universities must be empowered to use new technologies purposefully for the benefit of their work, and later for their pupils or students to gain new insights.

Only now do we come to the topic of dual work and study programs or university education for the employees of the future. Here – similar to the primary and secondary schools – there is much to be done

in Germany to get technologically and didactically up-to-date. If you look around internationally, you quickly see that Germany – even in European comparison with England, Switzerland, or the Scandinavian countries – is already well behind in shaping the digital future.

The greatest potential that Germany has so far left untapped is girls and women in IT and the digital industry. The image of computer science remains until today dominated by men. This can also be seen in the figures for dual work and study programs or university education. There is no reason for this to be the case. The gender gap first appears when children are 12 years old – until then, boys and girls are equally motivated and empowered to test digital logic and offer solutions.

If we start to bring into the foreground “soft” motivations of the IT and Internet technology surrounding us, the image of the industry would shine forth in new splendor. But to achieve this, the curriculum framework must be changed, and the applications and ethical dimensions of the technology must also be brought into the foreground.

The competition for the best minds in this segment began long ago internationally, often without an ethical compass, but even in Germany, the professional development of existing specialists is still viewed as a cost factor, rather than one of investment. This luxury is something that a high-income country like Germany simply cannot afford. The future is digital, regardless of whether we are talking about the automotive sector or industrial engineering, the medical or energy sector, or self-evidently about our core competence, the Internet industry.

Let’s finally make an ethically responsible big step towards the digital transformation of industry and society. I am sure it will be worth it!

## Expert Opinions

Digital (further) education enables many new ways of imparting skills and knowledge. The teaching of digital competencies is not only important for children and young people, but for almost all age groups, in order to ensure self-determined and responsible life and behavior.

The question is whether merely handling tablets and smartphones is sufficient. Writing, touching, and feeling, learning about the physical world: there is a risk that all this could disappear as a result of the premature use of digital aids by children. Digital technologies are primarily tools and not an end in themselves. In the worst case, these can impair in-depth learning and a realistic sense of orientation. This also applies to the all-embracing access to information, which is, however, increasingly disseminated without reflection, and the inherent truth of which is no longer checked – right up to the deliberate dissemination of fake news. The task is therefore both to convey expert knowledge on the use of digital technologies for “young and old” and to increase competencies

for the (critical) handling of them. But how can this development actually be controlled? How can digital and analogue competences be taught, used, and combined purposefully? How do we empower all age groups to live and act in a self-determined and responsible manner in the digital age?

**Ingo Ruhmann**

Head of Division D2 - Digital Transformation in Education, Federal Ministry of Education and Research (BMBF)

Politics and society are undoubtedly aware of how important it is for self-determination in our world today to ensure the competent handling of digital media, their content, and tools. But who is educating children and young people in this? And what should they learn?

Even primary school children should learn programming. Secondary school students are expected to be better at recognizing fake news than the editors of the biggest tabloids. And, of course, school children should be more reflective and responsible with their smartphones than many of their parents, and should calmly put “that thing” away instead of playing with it.

In the quotidian reality of our schools, digital education is a rather marginal phenomenon. Teachers usually have to install school software on the PCs in the classroom, if these actually work – the setting is reminiscent of the language laboratories of the 1970s. Schools that have developed into a digital campus are the exception. The strategy papers of the Conference of the [German] Ministers of Education and Cultural Affairs (KMK) and the German Federal Ministry of Education and Research (BMBF) show that they have identified complementary tasks to adapt our education system to the digital age. All pupils should be able

to acquire the skills they need to lead a self-determined life in the digital world. Because it is a task of our educational system not to ignore the reality of life, but to provide children and young people at school with stimulus, help, and orientation for the world in which they live. This requires progress at the technical, media-content and, above all, pedagogical level, on the goals of which the German Federal Government and the German states are now largely in agreement.

**Prof. Dr. Christoph Igel**

Scientific Director of the Educational Technology Lab, German Research Center for Artificial Intelligence (DFKI)

Digital transformation is changing education and training more than laws and regulations. Thinking and acting in hybrid networks and teams is crucial for shaping our future and the future of our children. Germany is gradually losing ground against international developments, and not only from the perspective of educational technology. Digitalization as an object and method of education, as well as for the support of educational networks, must be increasingly conceptualized beyond the formal sector: without informal and non-formal education, it will not be possible to generate a broad social understanding of the necessity, opportunities, and risks of the digital transformation of education and training. Our responsibility for our future and the future of our children means that we are all called upon to reconsider our stance on the digital transformation of education and training.

**Prof. Dr. Gerald Lembke**

Head of Studies, Digital Media, Media Management & Communication, Duale Hochschule Baden-Württemberg Mannheim (DHBW)

A childhood without a computer is the best start for the digital age! Kids should be playing in the mud rather than with tablets: Children need strong roots in reality before they plunge into virtual adventures. Their brains develop better when no tablet or smartphone prevents real world

experience. Adolescents develop their full cognitive potential when the brain matures without disturbance in the first years of life. Digital media could interfere with this process. The suppression of real-life experiences through high levels of virtualization prevents the development of intellectual capabilities. If a child is taught that all the solutions to life can be found on Google, the child comes to know a world that obviously cannot be mastered without technology. But real life is above all a life without always-on technology, and solving interpersonal conflicts or developing creative solutions to problems will always remain the domain of humanity.

**Prof. Barbara Schwarze**

Presidium of Initiative D21, Osnabrück University of Applied Sciences, Competence Center Technology, Diversity, Equal Opportunities

“Can you still become a Digital Native over 50? I can.” says Ilse Mohr, journalist and blogger.

Digitalization captures all areas of life: Education, private life, and work. What may seem rather amazing is that there is one particular function that it does not fulfil: It is not an equalizer. Access to, use of, and openness regarding digital media are largely a given for young people, as the D21 Digital Index shows. But deficits are becoming apparent in digital skills. Children of parents with an affinity for all things digital are brought into contact with digital media earlier and more comprehensively than children whose parents are less affine. Overestimating their own digital skills prevents many young men with lower educational qualifications from making an effort to develop their skills in a self-initiated way. For many young women, on the other hand, underestimating their own skills is one of the reasons for avoiding training or occupations in this field.

What can be done? Let us activate and renew our “analog” knowledge about the necessary foundations for learning processes and barriers to access, about the influence of parents and peers, and augment it with current digital possibilities to increase the attractiveness of education and learning!

The same applies for the older generation! What motivates many older people to learn? Together with others, in personal interaction, with pictures (positive, concrete), with repetition, and with a mix of media. So please: No mocking laughter about written, illustrated instructions for learning with digital tools! Which one of you, if I may ask, doesn’t really like using digital comics?

There is no such thing as “the” young, or “the” older generation. Both groups are diverse and deserve that we take an interest in their approaches, their learning experiences, their interests, and their economic situation, and translate these into “tailor-made” educational offers that they can use locally. The teaching of digital skills must provide insight, involvement, and communication. It must support regional development and take place in libraries, schools, youth centers, county halls, community centers, tea rooms, inns – wherever people want to meet in the region! Scientists and researchers must also appear there, and present their developments in a comprehensible and tangible way and allow them to be questioned.

**Joachim Schulte**

Consumer Issues Coordinator and Digital Compass Project Manager, Deutschland sicher im Netz

Trust in the connected world emerges through the confident handling of digital media. In order to be able to bring everyone along for the ride, and align digital transformation with ethical principles, all those involved must be empowered to understand it, manage it, and shape it. It’s important not to leave anyone behind – neither young nor old. To

this end, we must strengthen digital skills and focus on digital education. Older people in particular can make their everyday life appreciably easier through digitalization. The digital education of young people is also an investment in the future.

# Imprint

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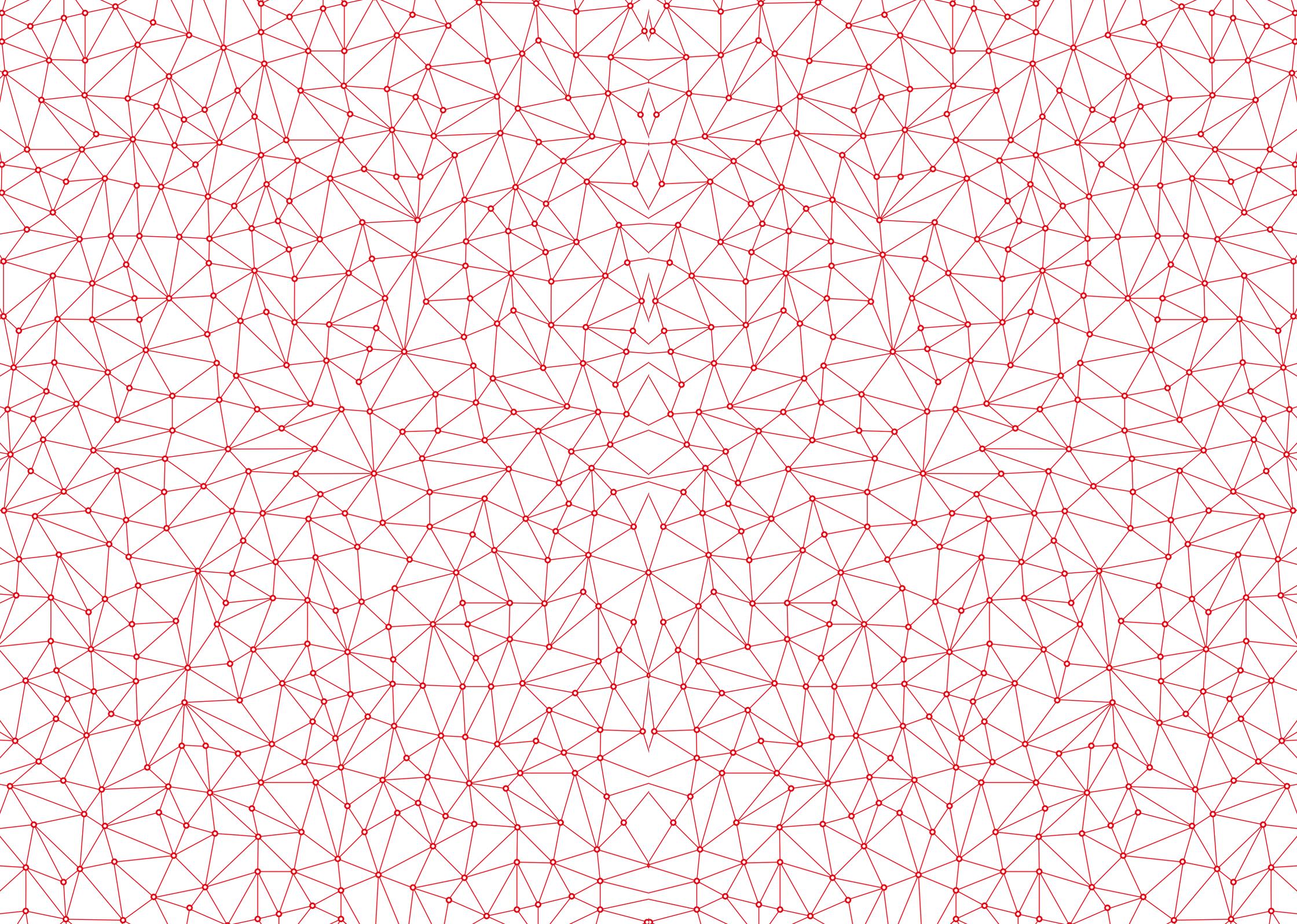
The results were weighted and are representative for the German population (age 18+).

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