



Federal Ministry  
for Economic Affairs  
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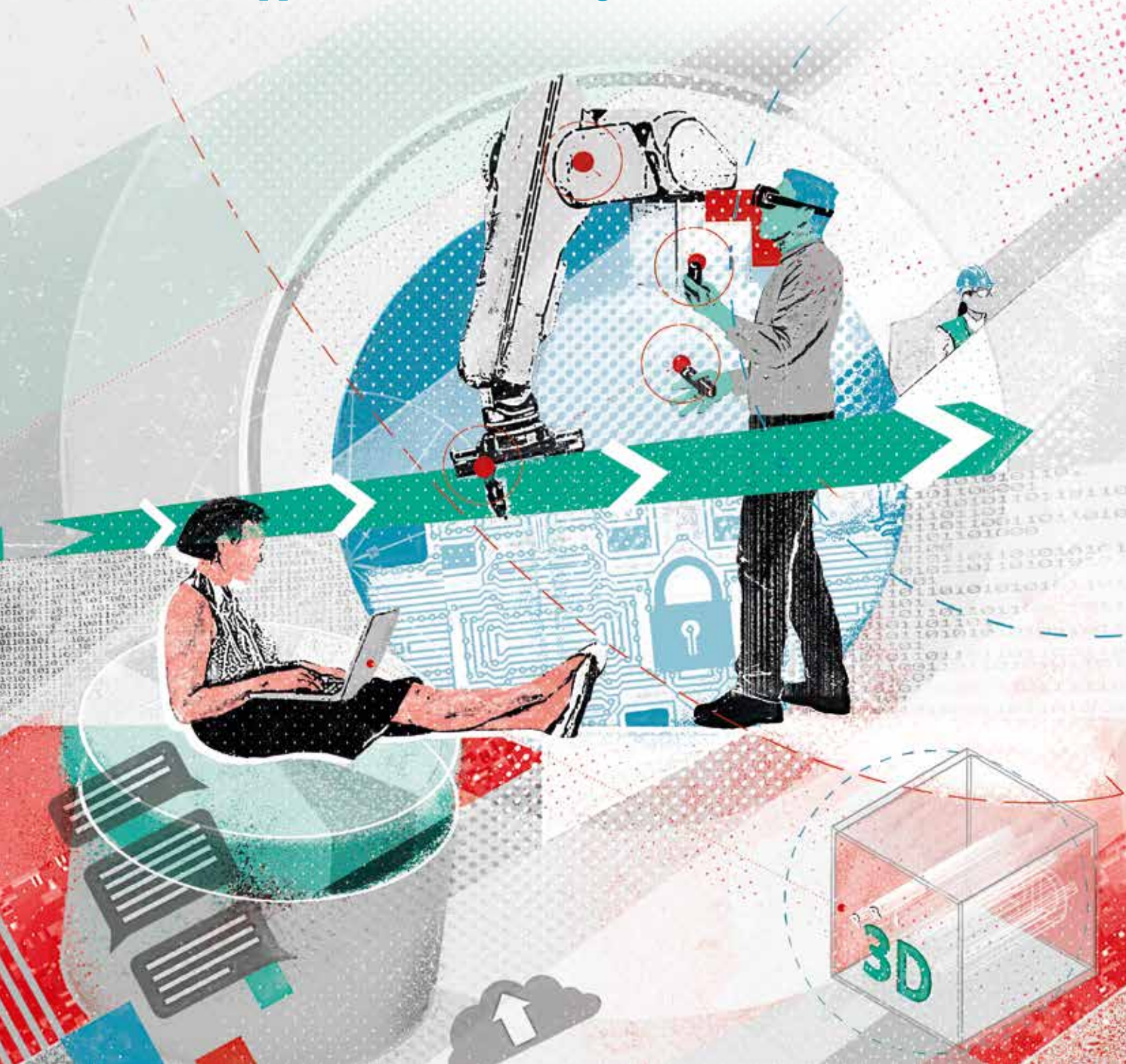
Federal Ministry  
of Labour and Social Affairs

Federal Ministry  
of Justice and  
Consumer Protection

# DIGITAL POLICY

FOR BUSINESS, WORK AND CONSUMERS

**Trends – Opportunities – Challenges**





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# I.

## Digitalisation in the social market economy: trends, opportunities and challenges



To a large degree, digitalisation is now already shaping the way we live, communicate, work, conduct business and consume – and will do so to an even greater degree in the future. The transition which we are currently experiencing is not a purely economic-technological process but rather a process encompassing all of society, one that also touches on issues of freedom and democracy. And digitalisation is an across-the-board topic, one that presents us with connecting interfaces, notably those that link up business, work and consumer policy.

In 1993 only **3 %** of data was in digital form worldwide.

In 2000 it was around **25 %**, by 2007 already **94 %**

Source: Martin Hilbert (USC), Priscila Lopez (UOC), The World's Technological Capacity to Store, Communicate, and Compute Information, February 2011, <http://bit.ly/2cDJDFX>

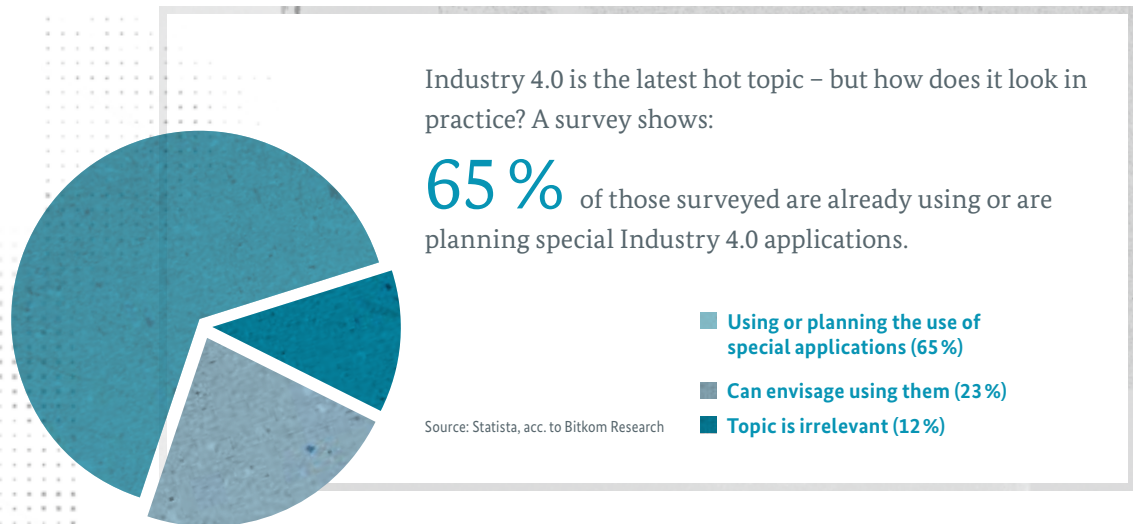


## Digitalisation trends

Digitalisation is currently being driven by technological advances in three areas and by how they interact:

- 1. IT and software:** The performance capacity of processors and data-storage media, as well as the speed of data transfer, continue to grow exponentially, making it easier to use cloud technologies and also mobile applications. Big Data technologies are opening up wholly new options for analysis. By now, algorithms with learning capabilities can justifiably be described as “artificial intelligence”.
- 2. Robotics and sensor technology:** While systems’ physical size and costs are shrinking, their opportunities for application and their usability are both increasing; this means they are also interesting for smaller businesses, individual manufacturing processes and even the private consumer in the “smart home”. In addition, there are new manufacturing techniques, such as additive procedures, as well as improved control and data gathering by means of new sensor technologies.
- 3. Establishment of networks:** This enables cyber-physical systems to emerge as the foundation for the Internet of Things and Industry 4.0 – networks of small computers, equipped with sensors and activators, are installed in objects, devices and machine parts, and can communicate with one another via the internet. In industry, process plant, machines and individual workpieces are continuously exchanging large amounts of information; indeed to a large degree they can now manage production, storage and logistical operations themselves. In activity areas close to consumers, networked devices communicate with one another in the smart home, while consumers can be online around the clock via use of a smartphone and fitness app. Based on Big Data, new business models and customer-oriented services are emerging (e.g. in the area of Industry 4.0.: process planning, sales planning,

forward-looking maintenance; for instance, in the realm of communication and the Internet of Things, e-commerce platforms, navigation systems and smart-home applications).



A current survey of 600 management personnel in Germany and the USA shows this: compared to the USA, Germany is by now performing better with regard to the digitalisation of its existing companies – although it continues to have too few digital start-ups and too few internationally significant digital platforms.

### Opportunities, challenges, areas of tension

The changes associated with digitalisation give rise to advantages and opportunities but, notably where the prospects for companies, employees and consumers intersect, they also generate whole new challenges and areas of tension:


1. Probably the most frequently discussed issue is whether digitalisation makes human labour superfluous because the work is taken over by computers or robots. Indeed, which qualifications will even be sufficient for people to get through their working lives with any security? Will digitalisation enable as many people as possible to continue to have employment in the future? If so, subject to what preconditions?

## More work or less?

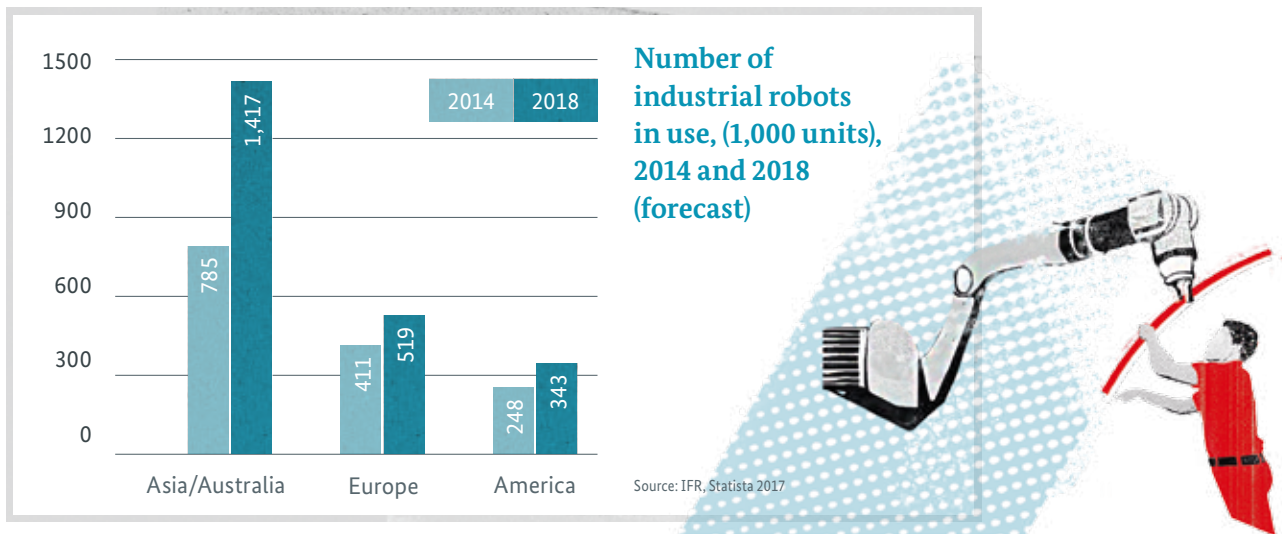
What digitalisation's net outcome will be in employment terms is currently an open question. According to the much-cited study "The Future of Employment" by Frey and Osborne, 47 per cent of those in employment in the USA are pursuing professions that will be able to be automated over the next 10 to 20 years. Another study, commissioned by Germany's Federal Ministry of Labour and Social Affairs (BMAS), produces a much more differentiated assessment: starting from the basis that professions are comprised of a variety of activities and that some but not all can be automated, this study concludes that only 12 per cent of jobs are subject to a high risk of being automated.

A further forecast produced by the BMAS, regarding the development of the labour market up to the year 2030, compares the "base scenario", assuming a constant level of digitalisation without placing particular points of emphasis, with the alternative scenario of an "accelerated digitalisation", one in which educational and infrastructure policy systematically direct their efforts to the digital transition. The key outcome is that, in the base scenario, the number of people in employment in the year 2030 is at approximately the 2014 level; conversely, and thanks to the effects on productivity, the accelerated-digitalisation scenario holds out the prospect of substantial positive effects on growth and employment.


2. New business models, such as digital platforms, can generate substantial advantages for consumers: greater transparency, freedom of choice and a reduced workload involved in obtaining information. But what consequences do these models entail for privacy and individuals' self-determination? Are the existing consumer rights compatible with digital business models? Digitalisation can only be accepted, and thus can only succeed, if consumers place substantial trust in providers of products and services. What are the consequences for demand and growth if consumers doubt companies' integrity, feel insecure, or fear unauthorised passing-on of their personal data, or its abuse?

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3. What effects will platforms and new business models have on future ways of working? Due to new, platform-based business models and the phenomenon of “crowdworking”, a company’s core of fixed employees could continue to shrink, with further outsourcing of tasks away from the firms themselves.
  4. In the future, business and the world of work will become more flexible. But what form could be taken by solutions also providing greater flexibility for the workforce, in terms of the workers determining what they will do, also with regard to time and physical location? How can the workforce’s range of individual needs be resolved harmoniously? How it can be ensured that the boundaries that divide working life and family/private life are not completely dissolved? And how can individuals’ co-determination of outcomes and flexible structures be made into compatible variables? How does the modern company of the future look, one that perhaps no longer in all instances matches the classic image of a company, but one that makes it possible to have participation and a sense of security within society?
  5. What ramifications will digitalisation have on the quality of work? Will the man/machine interaction lead to an upgrading or downgrading of skills that form part of professional qualifications, to an increase or a decrease in the physical and mental burdens that individuals face?
  6. If people and machines collaborate even more closely in the future, how can the machine contribute in rendering support to and developing individual people in their working process? Is individuals’ work made better by cyber-physical systems in Industry 4.0, by new production concepts, the use of robot technology, digital end devices, assistance systems, and much more besides? Modern robots and assistance systems can relieve workers’ burden of physically exhausting work, while making a reality of working conditions that are conducive to learning. Conversely, data capture in the networked value-creation process could result both in a compression in workers’ performance of their tasks, and in new mechanisms for assessing and monitoring performance, to workers’ disadvantage. And if data-gathering and data-use become an ever more significant theme, how can employees’ justified entitlement to data-protection be safeguarded?





7. On the one hand, Big Data technologies and auto-learn algorithms make very promising innovations possible, such as language-translation programmes, automated driving or spot-on diagnosis of illnesses. On the other, the forming of consumer profiles and projections about future consumption behaviour can reinforce social inequality and can continue forms of discrimination. What challenges do these new technologies present to the state and society? Do we have sufficient knowledge at our disposal regarding how they function, and their effects? Do we need an external monitoring body for algorithms and auto-learn systems?
  
8. Through digitalisation, industrial companies can accomplish radical conversions and improvements in their production – yet will they perhaps nonetheless lose their leading market position because new competitors edge their way to the front, with mastery of the client interfaces, e.g. search engines, and with superior data-related expertise?
  
9. How can we safeguard the balance between the economic players if individual providers know almost everything about their customers and, as a result, major information imbalances exist? How do you counteract processes of concentration, emerging through digital platforms, if intensive use of such platforms continues to improve the range of services on offer, yet simultaneously this sets up barriers to market-entry for competitors? How can the platforms be influenced so that they take on responsibility in combating criminality related to the dissemination of hatred?



10. Which challenges must our civil law take on if, regarding networked devices, the key issue (in addition to them being flawless at the time of purchase) is also that the digital additional services continue to work, even years after purchase? Who ensures, and for how long, that the software of networked equipment is updated by means of IT security patches? Is there a need to further develop the principles that determine which sellers and/or manufacturers of networked equipment currently bear liability for security gaps, so as to establish incentives for higher security standards, for instance, and to make it harder to set up bot networks? Or would this obstruct innovations by young technology firms?

11. What does the course of demographic developments mean for the digitalisation process? For instance, can telemedicine and digital technologies in the realm of health and care of patients contribute to improving the quality of health-care provision, especially in rural areas? And what does this mean for elderly people's social contacts?

These issues and areas of tension generate, in some instances, a very wide range of answers from the business community, trade unions, the science community and civil society. Many developments still have open-ended outcomes, which can still be steered towards one direction or another. One thing is already evident: the digital root-and-branch changes will stride forward and have more far-reaching effects than the changes in previous decades. The digital transformation brings with it lasting changes to existing structures and arrangements.

## Shaping digitalisation in the social market economy

Therefore the joint aim of business and the trade unions, of civil society and of politicians must be to use the opportunities that this digital transformation brings and to minimise its risks. This is about structuring the transition process in such a way that, as far as is possible, everyone benefits from the new possibilities and can take part in them. The social market economy can generate viable answers for the future, even in a changing operating environment. To do so the right course must be set. The social market economy, and its institutions such as its framework for how competition functions, or the autonomy of parties to wage negotiations, provide the suitable framework for action directed at structuring the digital-transformation process with fairness and appropriate judgment. The practical form that this takes is primarily established through legislation on business, employment and consumer-protection. This framework of arrangements is not static in nature; it must be regularly scrutinised and, where appropriate, adapted in the light of changes – such as digitalisation – that unfold in the business world and in society.

# II.

## Guidelines for the digital transformation



The task of shaping the digital transition for business, the workforce and consumers requires political guidelines. The issue is to ensure a fair balance of interests among the economic players involved in the global data-driven economy and also not simply to drive digitalisation forward without reflecting on the developments. What we need instead is a digitalisation of the world of business and of work that has direction and maintains finely-tuned judgment. It is only with an innovative digitalisation, maintaining balance of interests within society, that we can set a course; this course can enable Germany to take on a leading role in a digitalisation of business, living and working arrangements that directs itself to opportunities, earns trust and provides security.

Our guiding theme takes the strengths of the German economic and social model as its point of approach. This is characterised by a successful body of small to medium-sized firms, diversified quality production, innovative industry and a high level of export orientation. Strong, partnership-focused representation of employers' and employees' interests, as well as influential consumer organisations, contribute to competitive business. Now the task is to use this advantage for the digital transformation, so as to be internationally competitive long-term, with innovation steps built up on one another, while safeguarding high standards of environmental care and social welfare. Essential factors in this are qualified specialist personnel and a high wage level.

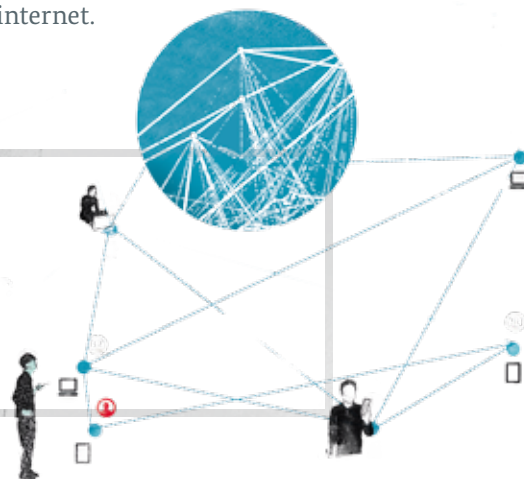
### Important guidelines in the policy areas of business, employment and consumer protection:

#### Growth and participation

If it is put into effect successfully by business, digitalisation serves as a programme of growth for Germany and Europe as a whole. Digitalisation, as a driving force fostering productivity, innovation and growth, helps Germany to maintain the financial viability of its social market economy and its social-welfare systems amid demographic change. Yet accompanying all increases in economic growth, the state and stakeholders in society must ensure that a greater level of prosperity reaches all elements of the population, opening up opportunities for as many people as possible to improve their circumstances. Of all processes, digitalisation is one that the state must accompany to bring about as broad-based a participation as possible, among all groups in society, in the resulting upward economic trend. Any split, creating winners and losers of the digital age, must be counteracted. Yet digitalisation can only succeed if consumers trust new business models. So a prerequisite for successful digitalisation is the safeguarding of consumers' rights, transparency and security in the internet.

In 2015, **20 bn.** devices and machines were networked via the internet; in 2030 the figure will be a half-trillion.

Source: BMWi, Impulse für die Digitalisierung der deutschen Wirtschaft, <http://bit.ly/1Kq6SKy>





### **Transformation instead of disruption**

Germany and Europe do not need a digital laissez-faire approach but rather a digital-transition process shaped by policy. Germany and Europe can become a role model for bringing together industrial competences and digital opportunities, for giving incentives to innovate and to invest, and for steering a bustling digital-platform economy into reasonable channels of operation, without it losing any of its dynamism.

### **Fostering technological and social innovations**

Digitalisation is not a new policy area but rather a topic of all-embracing relevance. What is needed is a fostering of innovation that also directs its efforts at important leading markets, such as mobility, energy supply, and communication. In reorienting production processes, the opportunity emerges to interlock technical and social innovations (e.g. through new systems of assistance). This requires joint measures undertaken by various governmental departments and policy areas.

### **Social-policy compromises and experimentation areas**

The best foundation for shaping the future is a market economy well balanced in its social-policy arrangements, offering security and flexibility to companies, employees and consumers. Flexibility without security would lead to people not committing themselves to difficult learning processes, and consumers withholding their trust from new digital business models. Security without flexibility would mean that no creative climate can develop for innovations. Likewise, companies need sufficient scope for manoeuvre, enabling them to develop innovative and competitive business models. In addition, the state is an important engine of innovation, fostering new technologies. It is also the guarantor of security, by shaping good working conditions conducive to innovation, as well as safeguarding fair, consumer-friendly markets. In order to create trust and acceptance, our wish is to provide support to areas for experimentation within firms, based on agreement being employers and employees. In consumer policy also, providing experimentation areas can serve as a suitable tool for testing the merits of new business models and new approaches to regulation of activities.

### **Maintaining individuals' employability**

The forecasts regarding digitalisation's consequences for the employment market produce a variety of results – yet they all agree that a high level of dynamism is to be expected in the labour market over the com-


ing decades. Activities, professions and sectors of economic activity will undergo changes. What becomes the focus of greater attention is the task of maintaining individuals' employability in a time of transition and thus also of securing the base of specialist skilled personnel. Our goal remains full employment, involving good jobs for everyone. A forward-looking answer to the challenge is to prepare the workforce for dynamic change in the world of work; it also entails creating structures that enable them to maintain their qualifications and their employability throughout their working lives. Significant investment of effort is needed for this, in getting workers qualified and in further vocational training.

### **Further developing the regulatory framework**

In international regulatory terms, the internet needs a level playing field. Passing Europe's General Data Protection Regulation into law and creating a Digital Single Market serve as important first steps. Yet more is needed: uniform norms and standards and the inclusion of online platforms in the regulatory structure, so that fair competitive conditions prevail for the same services, taking as their yardstick a high level of consumer protection and data protection, with effective legal enforceability.

### **Strengthening trust and security in the handling of data**

Trust and security are essential in the digital world, in order to tap into the digital transition's economic and social potential. A requirement for this is handling of data in an assured and confident way. We must see to it that, in business and society, the relevant bodies have the competences for digitalisation to be put to use comprehensively. Germany must remain one of the most secure digital locations worldwide. That is why we must work at improving IT security – notably also with regard to networked items of equipment in the Internet of Things – while ensuring that our contractual law and liability law are still equal to digitalisation's challenges. Digital transformation of business and society can only be a success if high consumer-protection standards are applied. As consumers and as members of the workforce, individuals must be able to rely on it that new business models and new product and service offerings are provided in a fully responsible operating environment, free of discrimination, especially with regard to individuals' personal data. This demands transparency and opportunities to channel the data-flows, as well as adherence to rights of individual self-determination with regard to information. The need is for a sufficiently open legal framework for the development of innovative digital



business models and, simultaneously, for individuals' data sovereignty to be safeguarded. The General Data Protection Regulation provides for data pseudonymisation as an instrument, as well as rules for initial settings that are data-protection friendly (privacy by default), as well as data-protection-friendly technical and conceptual planning (privacy by design). It is not permissible for digital offerings to be coupled with data processing that is not essential for the given purpose. Such requirements reinforce freedom of choice and decision-making freedom in the digital world.

### **Clear rules for democratic discourse**

Germany and Europe need a digital civil society that shares moral tenets of policy and values. A safe area must be set up where members of society can operate in a spirit of trust. They must be able to be sure that, in the digital media, they do not become a target for criminal offences or for violations of their personal rights, through others' expressions of opinion. The more people that take it as their basic rule that fairness, truth and human dignity continue to matter, the more digitalisation will be viewed as a progress factor in communicative interactions.

### **European sovereignty**

The best outcome for Germany will emerge if there is a closing of ranks in and with Europe, enabling digitalisation's opportunities to be taken jointly and its challenges mastered jointly. Europe needs a uniform legal framework. It is high time to say goodbye to the still-existing patchwork quilt of legal provisions and to develop a cohesive body of rules. Europe's reply to digital global markets can only be to think big and to act big, as well as to present itself to the world as a unified force.

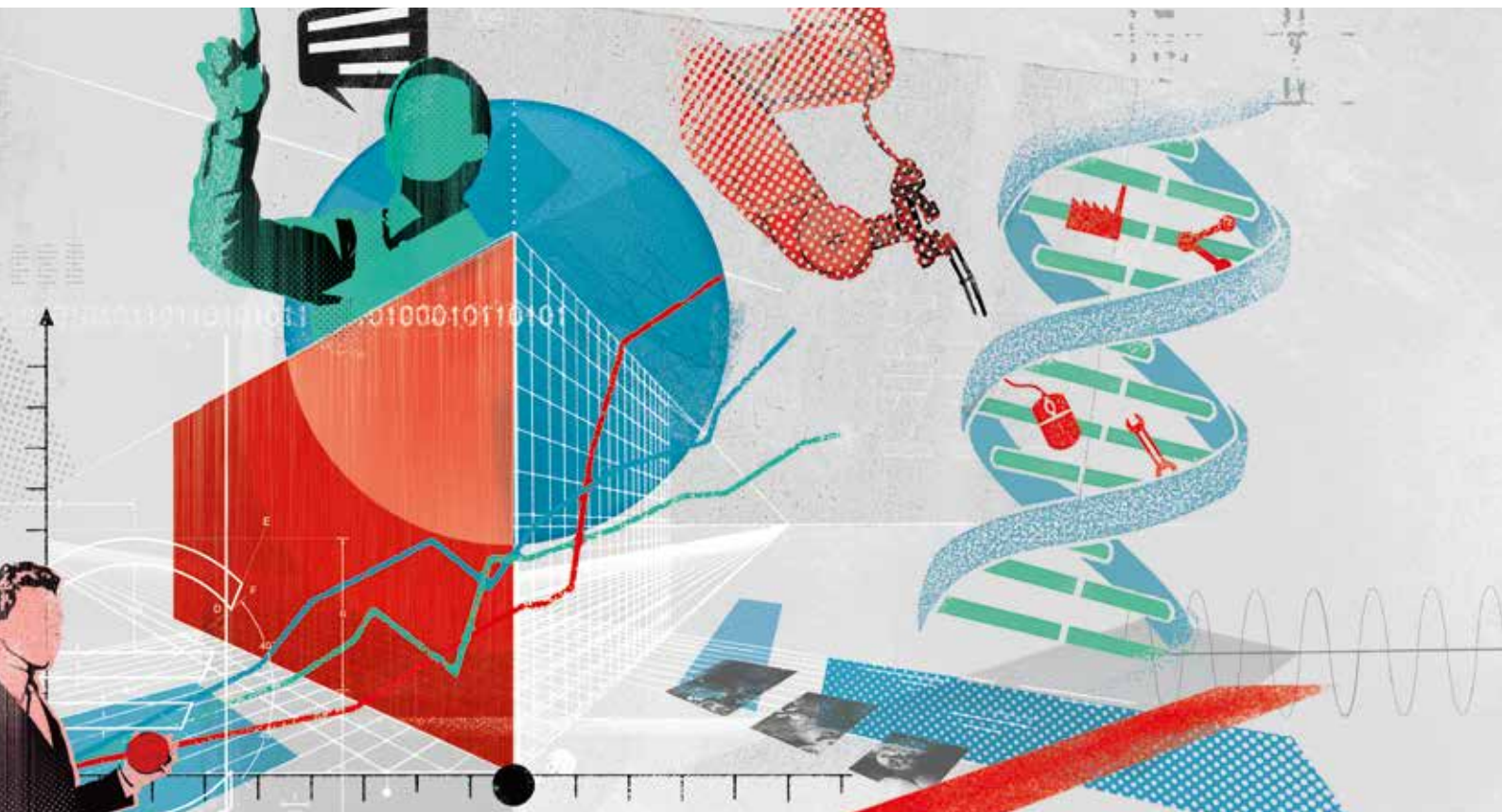
The path towards a modern regulatory framework in Germany and Europe will give rise to discussions, because competing interests are expressed. It is all about weighing up opportunities and risks against one another, overcoming contradictions, and resolving conflicts of objectives in a convincing way. Ultimately, value-based decisions will also have to be made – thanks to Germany's model of a partnership-based relationship between employers and employees, and of willingness to pursue dialogue, these will be well prepared.





# III.

## Areas of activity and initiatives



### 1. Growth and employment with Industry 4.0

Industry and the services associated with it form the heart of the German economy. They contribute decisively to growth, employment and prosperity in Germany. In many sectors German companies occupy a top position in global competition. German business must also maintain this outstanding position during the period of digital transformation.

Industry 4.0 affords vast potential for production that is more efficient, closer to the customer, and more sparing on resources, as well as bringing about additional value creation through new business models. In the

intelligent factory, tools, machines or means of transport are coordinated centrally via IT systems. This change in interaction between humans and machines opens up new opportunities for how work is structured: these include a reduced burden of routine tasks; health and participation; the development of workers' professional competences and, not least, greater compatibility of professional and private life. Also emerging from this are new opportunities to take part in working life, because individuals' physical or sensory disabilities can be compensated for by using assistance systems.

Up to 2020 German industry wants to invest

**EUR 40 bn.**

annually in Industry 4.0 applications.

Source: PricewaterhouseCoopers, <http://pwc.to/1MVtpBM>



Digital production brings together the advantages of mass production with the aspirations of individually-specified production. This has huge ramifications for productivity, for bonding with the customer, and for competitiveness. The aim is to make Germany the leading provider and user of Industry 4.0 and thereby the world's most modern industrial location. For this it is important that as many players as possible get involved in the process, jointly define challenges faced, and find solutions. It also requires very considerable private entrepreneurial and public investments in infrastructure, technology, working processes and competences.

- The **Industry 4.0 platform**, supported by the Federal Ministry for Economic Affairs and Energy, significantly contributes to the digital transformation of production. The platform is dialogue-oriented and is sustained by relevant involved parties from the business and scientific communities, trade unions and politics. Working together with politicians, around 300 experts in five working-groups formulate recommendations for action and guidelines: these relate to reference architectures, standards and formulation of norms, research and innovation, safety of networked systems, and legal frameworks; they also relate to work and to basic and further vocational training. Regionally-based events (e. g. the Industry 4.0 SME Days) disseminate the results and the examples of implementation. Successful examples



from actual practice, highlighting the specific benefits of Industry 4.0 solutions, re particularly helpful for small to medium-sized enterprises in planning their own digital strategy. Around 300 such examples are summarised on an online map of the Industry 4.0 platform. The Labs Network group of organisations, originating from the Industry 4.0 platform, gives support to SMEs in gaining access to test centres, for new technologies to be tested-out there. So that companies can produce globally, machines need to be able to communicate with one another across national borders. This means that Industry 4.0 needs internationally uniform, open and interoperable standards. With the so-called reference architecture RAMI 4.0, the Industry 4.0 platform has created an acknowledged foundation for standards to be developed and harmonised internationally. Cooperation initiatives are in place with China, France, Italy, Japan and Australia, and also with the USA-based Industrial Internet Consortium, aimed at advancing standardisation and enhancing security. The Industry 4.0 topic was also taken up during Germany's G20 presidency and is to be further developed at that level.

- Which are the greatest obstacles to innovation, in the context of digitalisation of Germany as a business location? These and other topic-specific issues are addressed by the five working groups of the **Alliance for Industry**, which produces recommendations for action. The alliance's demands for a competitive and innovative Industry 4.0 include a broadband infrastructure in Europe that matches industry's needs, an "Industry 4.0 check" for future legislation, global standards and specifications in business, as well as a level playing field with regard to the framework for public financial aid within Europe.



## 2. Shaping Work 4.0 in the digital world

A decisive aspect of the debate surrounding the digital transformation of business and Industry 4.0 - alongside the impact of technological innovations per se - is the impact of these innovations on the work of work.

So it is of much importance that the digital transition in the world of work is structured in such a way that this transition also gains acceptance among the workforce, in order to strengthen the principle of “Good Work”, while simultaneously making innovations possible without major conflicts or job losses. This effort will only be successful if the state, trade unions and employee organisations - as well the concrete reality for businesses - are holistically taken into account and interlock.. So a key factor in shaping digital work, in a way that nurtures positive outcomes for people, is the involvement of the workforce.

- In order to address the transformation of the world of work in a timely way, the Federal Ministry of Labour and Social Affairs (BMAS) published a Green Paper in April 2015, which became the basis for a broad-based **dialogue process – “Work 4.0.”** The culmination of this process led to the publication of a **White Paper**, setting out early results. The dialogue’s aim was to exercise foresight in explicitly stating the rules of the game for the future world of work, and to contribute to shaping them; its point of orientation was the guiding image of “Good Work”. In addition, key topics were examined in the “Digital World of Work” platform, within the digital-summit context: “Time-flexible and location-flexible working”, “Employment and further vocational training”, as well as “Health and participation”.



Almost every individual is affected by digitalisation: already, a survey commissioned by the Federal Ministry of Labour and Social Affairs (BMAS) states that

**83 %** of the workforce use digital information or communication technologies.

**29 %** associate such technologies with reduced physical workload.

Source: BMAS: Monitor: Digitalisation at the Workplace. Latest results of a survey of a Company and its Employees. Berlin, 2016.

Essentially, the following tasks emerge for a World of Work 4.0:

**Qualification and further training:** The future of Germany as a business location decisively depends on good training and the vocational qualifications of its workforce. The aim of the political measures addressing the demographic and digital transformation should be: full employment and good work throughout individuals' working lives. Investment in training at school and university, as well as training and further qualification in work, strengthens business's competitiveness and their capacity to innovate within the context of an ageing society.

**Flexibility negotiated on the basis of strong social- and company-based partnerships:** Digitalisation provides the opportunity for self-determination in a World of Work 4.0. Yet conflicting goals need to be balanced out to realise this. Digital technologies can provide support to working with time-flexibility and location-flexibility. Indeed, not all workers can work

from home or wish to do so. However, demand for such opportunities does exceed supply.


**31 %** of employees occasionally work from home. So as to better harmonise family life and working life and to save travelling time, even more employees would like to use such an opportunity.

Source: Federal Ministry of Labour and Social Affairs (BMAS). Monitor – Mobile Work and Work without Boundaries. Current results from a survey within a company, among employees. Berlin, 2013.



- In its recommendations for action – “Shaping location-flexible and time-flexible work” – the **“Digital World of Work” Platform** highlights opportunities regarding how employers can better match their employees’ needs for flexibility, without putting the company at a disadvantage. A key recommendation is to set up company-internal experimentation areas/practice laboratories: in these, employers and employees are involved in testing out new practical approaches to structuring work. Social partners and scientific evaluators will be involved in their development, implementation and evaluation.
- Negotiated working-time models and compromises on flexibility are becoming ever more important. A possible more far-reaching approach in shaping this would be a **Working Time Choice Act**: this could combine greater choice for the workforce, in terms of working time and location, with a possibility – subject to specific conditions – to deviate from certain provisions of that Act, based on agreement between employers and employees, and more broadly within the given company. An important element here is to create a right to limited-duration part-time working, i.e. to be able to switch back up to one’s earlier number of working hours after a phase of part-time working.

**Strengthening the binding nature of collective agreements:** To successfully master the digital structural transition, there is a need to strengthen the processes of reaching agreements between employers and employees and more broadly within companies. In many cases, employer/employee partnership and co-determination of outcomes make more precisely-targeted agreements possible at business-sector-level or individual company level, than would be the case through overarching legislation. One-size-fits-



all solutions are becoming less appropriate in digital business. So the challenge is to develop further incentives and instruments enabling us once again to strengthen employer/employee partnership, binding collective agreements and also the formation of Works Councils.

This also requires that the social partners follow new paths. It has become clear in the context of the "Work 4.0" dialogue process that structural changes are taking place in the labour market; consequently, established instruments for ensuring that the workforce also shares in a flourishing economic situation are no longer as effective.. The Federal Government's "5<sup>th</sup> Report on Poverty and Wealth" names these critical developments; the danger exists that the digital transformation of the economy could lead to a further polarisation of incomes. The challenge is to find answers to this.

Digitalisation also has a particular impact on service sectors and trades-people. Here the issue is not solely the activities in themselves, but also the increasing offer of such services via intermediaries on digital platforms. Binding collective agreements in the service- and care-sectors should be strengthened and increased. This is why we welcome efforts directed at concluding a collective-agreement contract for the social-welfare professions that is binding throughout that activity sector.

**Occupational safety 4.0:** Occupational safety needs to be adapted not only to the digital transition but also to the demographic change in the workforce, which is already being felt. This necessitates use of the potential for digital systems and applications (e.g. lifting-aids, robots, smartglasses, intelligent protective clothing) for safe and healthy work. Alongside physical burdens, psychological burdens also demand increased attention. Therefore the Federal Ministry of Labour and Social Affairs will work towards the establishment of an "Occupational Safety 4.0" through the further development of occupational safety instruments.

- In the context of the "**Digital World of Work**" platform, companies, employers and employees, politicians and scientists are discussing areas of potential that digitalisation offers for occupational safety, and how these can be put into effect. For instance, this includes accompanying changes in terms of the organisation of work, workforce involvement in this issue at an early stage, and agreements on the protection of employees' personal data.



- The aim of an inter-ministerial **innovation, research and transfer strategy, “Work 4.0”**, is to contribute to Germany becoming the leading market for the development and use of digital systems and apps that promote healthy working. We want to think in terms of combining occupational safety with innovation. In this regard, we will examine whether a market-incentive programme for SMEs to develop digital assistance systems for increasing work quality would bring more dynamism into the market.
- More intensive research is needed to identify which digital technologies are user-ready and suitable for supporting good and healthy work, as well as for promoting greater participation in companies’ workforces. Scientific analyses and pilot evaluations are important in supporting policy-makers, but also (public) advice centres. Scientific analyses and the assessment of pilot applications could render support to corporate decision-makers, but also to (public) advice centres. For this purpose, an inter-ministry initiative should be launched for a regular, independent and publicly accessible scientific assessment of the latest technological developments and experience of actual implementation. There is also a need to improve the ability to evaluate the consequences of technical innovations with regard to their effects on health and on the quality of work.
- Based on the final report of the Federal Institute for Occupational Safety and Health (BAuA), regarding the research project “Mental Health in the World of Work – Scientific Determination of Current Status (in Germany)” – the study’s findings are discussed with the employers’ and employees’ representatives respectively; conclusions are made for structuring a world of work that does justice to health concerns. For this purpose, the dialogue process “Mental Health in the World of Work” was called into being on 5 May 2017, one in which the Federal Ministry of Labour and Social Affairs takes part alongside employers’ and employees’ representatives, as well as the various German Länder (states) (via the Joint German Occupational Safety and Health Strategy). Further players on the issue of companies’ occupational safety (individual trade unions, associations specific to particular industries, institutions managing social-security provisions) are also involved on as broad a base as is possible.

**Protection of employees’ personal data:** The need to take action on protection of employees’ personal data emerges from the advance of technological developments and the growing significance of digital applications in the



world of work, as well as from the new European legal framework, the **European General Data Protection Regulation**, coming into force in May 2018.

**Securing new forms of working life:** The introduction of a statutory minimum wage during this current government's term of office constituted an historic step towards preventing the spread of very badly-paid employment and thus towards creating more equal competition in the various business sectors. In addition, many companies are banking on the use of so-called external personnel. So as to secure necessary flexibility and simultaneously to prevent abuse, we have adopted new rulings governing the use of externally-hired personnel and of contracts for work and services. However, via platforms or crowd-sourcing, the digital economy opens up new possibilities for replacing employment of personnel through new, self-employment-based forms of professional activity. Many rights that apply to employees do not apply to the self-employed. This is where we need to prevent abuse.

Even if employment made available via platforms is acknowledged as having much potential, in this context no discernible increase in self-employed work can currently be diagnosed for Germany. Studies done so far indicate that work made available via digital platforms is mostly done as a sideline professional activity. New manifestations of working activity, such as crowd-working or click-working, give rise to new issues in establishing the demarcation line between being employed and being self-employed. Likewise, from the companies' perspective, there is a need for a level playing field in the platform economy and, in regulatory-policy terms, a requirement to prevent emergence of economic advantages through forms of employment not protected by social-welfare provisions. At the same time, a good framework must be established for the self-employed and for start-ups – an important task for economic policy. Labour-market policy and social-welfare policy can contribute to securing

the formation of new companies and to rendering support to individuals' pursuit of a self-employed professional activity.

Where applicable, the issue here is to further develop the criteria of demarcation that are determined by legislation. The growing pluralisation of forms of working and of individuals' professional paths also raises the issue of securing all the types of employment held during a person's working life – in terms of social security, and spanning all professional activities. Against this background, one outcome of the “Work 4.0” dialogue process is that, in principle, the self-employed are to be included in statutory pension-insurance provisions just as employed individuals are. The associated burdens as regards contribution payments must be assessed jointly with payments made into other social-insurance systems, especially the statutory and private health-insurance systems respectively. There should be a greater use of the possibilities afforded by laws currently in force, e. g. regarding the conclusion of collective bargaining agreements in favour of self-employed individuals working on a basis similar to that of an employee, accompanied by improved provision of information available on this topic. There is also a need to optimise the data regarding the spread of digital platforms and the professional activity performed on that basis, as well as on the registration and recording of crowd-working.



### 3. Consumer policy 4.0

Connectedness and digital business models present consumer policy with new challenges. The opportunities and hopes associated with the emergence of the internet and digitalisation, from the consumers' perspective, are exposed to dangers. Digital diversity is being threatened by processes of market concentration (above all in the realm of platforms); open communication in social networks is filtered through algorithms; network neutrality is called into question by service providers; new digital applications are being bought through the passing on of individual' private and personal data; access to data can lead to the formation of profiles; and algorithms can influence consumer behaviour.

Above all, the development of auto-learn algorithms and artificial intelligence generates new social and ethical issues. The matter of what price a flight ticket sells for, or of the conditions applied to access to credit and insurance for consumers, usually depends on an algorithm.

Use of this technology, involving many opportunities, must not be allowed to lead to people being discriminated against or to individuals being “cemented” into their current status in society. For this purpose it is necessary for a public monitoring authority to ensure a sufficient minimum level of objective justifiability of decisions. In data protection terms, the General Data Protection Regulation does establish a clear legal framework for automated decisions on individual cases. Yet if algorithms produce forecasts about human behaviour, or make or prepare decisions, on principle they must additionally be able to be checked by a monitoring body, for instance regarding compliance with a ban on discrimination and also with fair practice. This is why we will develop approaches to establishing regulations, enabling the ramifications of certain algorithms to be checked. The aim is a reliable legal regulatory framework that maintains a corridor for innovations yet imposes regulatory boundaries on the use of potentially discriminatory algorithms.

As responses to the challenges of digitalisation, neither bans hostile to innovation nor a laissez-faire policy are suitable. Instead we want well-crafted guiding pillars that create the economic possibilities stemming from digitalisation and directed at consumers’ and companies’ wellbeing, make fair competition a reality, and suitably enable the demand side of the equation not to be outpaced by supply. For this, we deploy a mix of instruments that emerge from technology-neutral rulings, and that secure for the future a supervisory structure capable of action: effective law enforcement; financial support to representation of consumers, and provision of consultancy to them, in terms of civil-law; improved consumer rights; good consumer-information; and also expansion of consumer research.

An element that has proved particularly effective is our German model of dual-pronged law enforcement: by combining instruments of civil law and public law, consumers and producers and service providers acting ethically benefit from the advantages of the respective law-enforcement systems. We have achieved a lot in recent years:

- At the Bundesnetzagentur (public agency for electricity and telecommunications) and at the Federal Financial Supervisory Authority, consumer protection was anchored in the process as a supervisory goal.
- In financially supporting the “**Marktwächter Digitale Welt**” (Market Watch Digital World) at the Federation of German Consumer Organisations, we have fostered the build-up of consumer-oriented monitor-



ing of market activities. Market events are observed and assessed, both on the basis of consumers' complaints and also of empirical studies with greater depth. Any state of affairs unacceptable at the structural level is recognised; supervisory and regulatory public authorities are notified. If the law is violated, the consumer centres also enforce consumers' rights through civil law. Alongside other players such as associations of (product or service) providers, politicians and the media, consumers are also informed about insights gained by those monitoring the markets for abuses. As an early-warning system, consumer warnings are published if problems are recognised. The Market Monitor – Digital World operates in five key consumer centres, each with a different area of emphasis: digital services; digital purchase of goods; digital goods; user-generated content; and telecommunication services.

- By means of our amendment to the **Law on Applications for Injunctions**, consumer associations now also have a right to take legal action in cases of a breach of data-protection.

To address the new challenges of digitalisation effectively, we want to further expand the system of dual legal enforcement. Our emphasis in this is on the following:

- With the possible introduction of a **sample legal action for a declaratory judgment** (Musterfeststellungsklage) the aim is to strengthen legal protection for consumers with regard to standardised mass transactions. That way, rights in relation to companies and service providers can be enforced more simply and without a high level of financial risk. At the same time, legal proceedings are conducted more efficiently and quickly if they involve numerous consumers in exactly the same way.
- We want to build up public-authority structures with real impact, active in the realm of commercial consumer protection. To this end, under the remit of the Federal Ministry of Justice and Consumer Protection, we wish to pool together those areas of competence (for instance) that can effectively safeguard the monitoring of social networks' reporting obligations, the tasks required as the relevant public authority and the central interfacing point of contact according to the Consumer Protection Enforcement Act, as well as the role of an institution entrusted with observing and monitoring market practices.

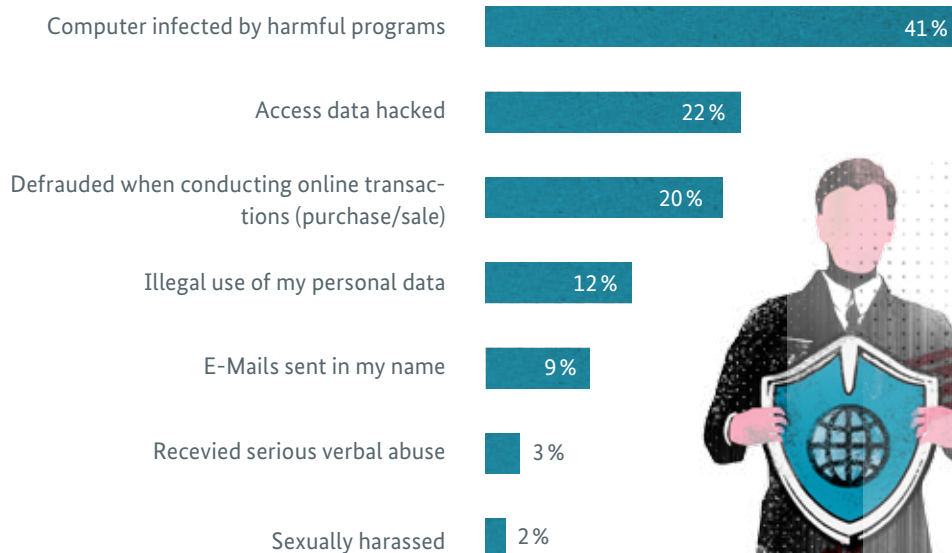
- In Germany, rules such as the Act against Unfair Competition, serving the objective of consumer protection, have hitherto primarily been enforced in civil-law proceedings, by associations, competitors or public authorities. Yet in practice, particularly with regard to business models of new kinds and of a fast-moving nature, in digital business there are (in some instances) major shortcomings in enforcement of the civil-law system. The associations do not in all cases have the possibilities at their disposal to bring the facts to light on highly complex subject-matter regarding severe violations; in the event of scatter-shot damage, affecting many disadvantaged parties, they cannot retrospectively put into effect a reversal or a filtering-out of disadvantages gained by improper means. The net effect – alongside lasting violations of consumer-protection rules – is primarily also unfair competition conditions for companies that adhere to the law. To close these gaps in enforcement, we want to strengthen the Bundeskartellamt (cartel authority), entrusting it with the right, in the event of systematic violations of consumer-protection rules and procedures, to instigate effective actions that give a suitable signal to the market. This public authority is to operate exclusively in the public interest and not conduct any individual enforcement of the law for individual consumers. For instance, the public authority's instruments should include obtaining companies' financial data, the issue of orders requiring termination, as well as provisional directives, and a requirement for reimbursement of the financial gains obtained through the unlawful behaviour. If companies breach enforceable directives, the public authority must be given power to impose fines for this.
- We also want to better enable the **Bundesnetzagentur** agency and the **Federal Financial Supervisory Authority** to recognise the different challenges faced in their realm of competence, and to act with appropriate speed. In doing so, we want to further improve the joint enforcement of consumer protection, on digital topics as on others.
- To date, the Federal Government lacks a competence centre that draws together scientific specialist knowledge on the digital transition, proactively examines subject-specific questions and legal questions on the digital economy, draws up proposals and publicly submits them for discussion, and also develops codes of behaviour jointly with the business community and consumers' representatives. We will check whether a **digital agency is to be set up** and, if so, under which ministry's responsibility.

Ransomware attacks by “Wannacry” Trojans, a hacker attack on telecom routers and a DDoS attack which temporarily disabled Twitter, Netflix and others in the USA: IT security in the Internet of Things has become a challenge for the protection of consumers and for networked business.

The glaring security gaps for billion of “smart” units of consumer equipment can have two consequences: networked dishwashers, televisions or webcams are subject to attack by criminals and can be rendered non-functional. In addition, merging hijacked IoT devices to form a bot network can be used to disable critical infrastructure elements or private companies’ IT systems.

### Viruses, fraud, data theft: many are affected by cybercrime

In the last 12 months of internet use, what experience of criminal activity have you had?



Source: Bitkom Research, 2016. Representative survey among 1,017 internet users; 14 or over



Because of a lack of economic incentives, the market for units of IoT equipment will not solve this problem by itself. This is why we are working on an overall concept, drawing together various tools and thus providing more IT security. The following are possible elements in this:




- IT security rules (“**Right of digital product security**”), valid throughout Europe, containing binding minimum requirements and monitored by a market supervisory system. A precondition for this is to establish technical norms and guidelines, such as are currently being developed for internet routers, to serve as an example.
- Through the introduction of a voluntary **IT seal of quality** for products with internet capability, consumers could obtain greater transparency in their purchase decision, with regard to products’ IT-security characteristics.
- An “**update**” for our contractual law could establish an additional economic incentive for a high level of IT security, and adapt contractual consumer rights to match the needs of the digital world. The starting point for checking this is that the issue, for networked devices’ suitability for use and IT safety, is no longer solely whether the equipment was suitable for use at the time of purchase, but rather that software updates have become necessary for the product’s entire life cycle. Sellers of networked equipment are also not usually deemed to be at fault for damages to assets resulting from a software security problem (e. g. due to data losses).

In this regard, the legal-policy proposals include the following, among others:

- Prolonging of guarantee obligations and the shifting of the burden of proof in relation to associated software,
- Europe-wide introduction of entitlements similar to guarantees, in relation to the manufacturer, who then also holds liability for the provision of digital services, as well as
- The introduction of an “update obligation”, for a period still to be more closely defined.

We are monitoring technical developments attentively from the perspective of whether, beyond contractual law, there remains a need for adaptation in the future. We are committing to tracking the discussions, conducted on many levels regarding this topic, also considering the emerging issues from a scientific viewpoint, by means of relevant research projects.



The European Commission's aim of the **Proposed Directive on Contracts for Supply of Digital Content to Consumers**, submitted at the end of 2015, is to harmonise rulings on contractual legality, on guarantee rights in the event of non-adherence to the contract, and also on the burden of proof in this context. In principle the Federal Government supports the proposal. Matters of fundamental importance for the Federal Government were taken up into the negotiations – such as the inclusion of contracts with personal data, the establishment of objectively-defined conformity criteria, and also the necessity of balanced and legally-secure rulings in the context of the guarantee.


Personalised prices can provide advantages for consumers. However, there are information asymmetries; frequently consumers cannot recognise whether what they have is a personalised price and what data formed the basis for it. This is why we want to increase transparency. In addition, there is a need to enforce consistently the legal boundaries in terms of data-protection law, the ban on discrimination, and the ban on misleading one's customers, established in competition law.

At the invitation of the Federal Ministry of Justice and Consumer Protection, a group of experts, comprised of various stakeholders from the app sector, (app store providers, add-developers from various activity areas, renowned app testers, as well as specialists in consumer, data and child protection) developed **a best-practice catalogue for consumer-friendly apps**. The aim is for this joint guide to serve the market, as an orientation for everyday practice consistent with consumers' concerns, to advance the competition concept in this context, and to act as a stimulus for providers of products and services to undertake self-imposed obligations.

An important instrument in effective consumer policy is items of consumer information. Information items that are independent, target-group-specific and (in some cases) drawn up jointly with the individual consumer groups, create transparency in dealing with the diversity of digital offerings. Yet beyond digital inclusion, analogue consumer information and formats that involve information-users searching for reference material are also necessary, especially for the benefit of the elderly. To offer orientation in everyday consumer life, the Federal Ministry of Justice and Consumer Protection has given financial assistance to a range of consumer-information projects:

- The portal **mobilsicher.de** provides information on secure use of mobile end-devices, putting users in the picture on how apps work with users' data.
- In the **Digital-Kompass** project ([www.digital-kompass.de](http://www.digital-kompass.de)), elderly citizens are shown the opportunities provided by the internet, with the involvement of voluntary multipliers, and its secure use is encouraged and nurtured. The project makes offline materials available and is the central point of online contact for planning digital meet-up groups, organisationally and in terms of content.
- The project “**Monitoring and assessing child-oriented apps**” focuses on integrated provision of a set of consumer information on youth-related risks, data risks and consumer-protection risks, with regard to apps targeted at children, evaluating these apps as being worthy or unworthy of recommendation. It is also shown how the apps tested can be set up and used in a child-friendly way.
- In the project “**Web Days 2016 – The Youth Conference for Consumer Protection in the Digitalised World**”, 60 adolescents discussed web policy and educational-policy-related challenges of digitalisation, as well as developing demands from the consumer perspective. In the form of an agenda for youth, these were published and released to other young people for assessment and discussion. This created a new type of participation on the part of young consumers.
- In projects directed at **digital consumer information for refugees**, based on shared creativity and participation, migrants check existing items of digital consumer information for refugees, in a test environment kept realistic (a living lab); they also develop new service offerings suitable for the target-group. In a further project, consumers from a Turkish-immigrant and Russian-immigrant background respectively are informed about consumers' rights with regard to special product offerings – mobile radio, online trading and online services.

In the past there were numerous consumer complaints on the topic of WAP/web billing: providers of mobile telecommunications services were purported to have charged for third-party-provided services supposedly booked in the internet, although the consumers had not ordered these services. The supplement to the Telecommunications Act, launched by the Federal Ministry of Justice and Consumer Protection and the Federal



Ministry for Economic Affairs and Energy, ensures that consumers are effectively protected in the process of billing for supposed third-party services. The option to block the third-party services already existed – yet only the customer can instigate this (the so-called “opt-out” procedure). Flanking this, the Bundesnetzagentur agency now has the task of determining the so-called “redirect procedure” used for the whole market, on a binding basis; in this process, when the contract is concluded, the customer is redirected to the mobile services’ provider’s website. This procedure serves as an effective and, if used throughout the market, effective model for combating abuse of consumers’ rights.


Service platforms in the **share economy** offer chances and opportunities for consumers but also for innovation and competition. To this purpose, they must comply with certain minimum requirements; it is not permissible to undermine consumers’ rights through new business models. This includes the safeguarding of quality standards; providing comprehensive and readily understandable information regarding all essential circumstances; and taking on responsibility in relation to the platform’s users. For customer assessments of the listing, it can prove helpful to have information on payment of commissions and also business connections among companies or between companies or individuals, clear notification on sponsored links and information on whether customer assessments are actually checked by the platform. There is also a connection between good working conditions and the provision of qualitatively high-calibre services. At the same time, for regulatory-policy reasons, platforms must be prevented from using legal grey-zones, with regard to individuals’ employment status, to save costs and thereby to gain unjustified competitive advantages in relation to other companies. For instance, from the workforce perspective, it is important that platforms also make available targeted and reliable information about quality-related aspects, such as vocational training and other qualifications, special knowledge, experience etc. This is the only way that customers for services ultimately have the opportunity to contextualise prices and the service on offer. The statutory framework ought to be scrutinised accordingly with regard to necessary adaptations.



## 4. Strengthening digital competence at all levels

Digitalisation makes itself felt in our professional lives, in our social interactions, in our democracy and our everyday life. So digital competence is the prerequisite for the digital transformation's success. It is indispensable for each of us, in order to be prepared for the working world's requirements in our knowledge society and to be able to take part in this transition within society: in working life, as a consumer, as a member of society. The key to this is education for digitalisation – because those not able to link up to the digital world will not be able to take part in a whole range of developments.

Digital education entails two related competences: firstly, having self-assurance in using digital devices, applications and items of information, and secondly adjusting to changes that emerge due to the use of new technologies and new ways of working, but also due to the structural change in the economy, such as increased dynamism in the provision of knowledge or new working processes and professions.




Digital education and education for digitalisation need to be imparted throughout each phase of life and of education. The key term is “lifelong learning”. This begins with education for young children, includes school, higher education, initial and further vocational training, and encompasses work with senior citizens. Its basis is a functioning – and also digital – infrastructure at all places of learning, primarily in (vocational) schools, yet also in companies, and not least at home. Through new and individual learning formats, independent of place and time, additional groups can be reached – e.g. those in employment who are providing care to family members.

The transition in the worlds of work and learning are shaping individuals’ career paths at all qualification levels: these are becoming more dynamic, diverse and individual. The central employment-policy challenge is to shape transitional periods between the key phases in professional life; to actively support individuals’ entries into it, as well as switchovers and advancements within it, in addition to helping individuals to prevent a backward step in their development. So primarily it is necessary to intensify the further-training activities of companies, employees, representatives of employers and employees respectively, and politicians. Not least, this point is emphasised by the Final Report of the “Employment and Further Vocational Training” focus group, comprised of scientists, trade unions, employers and politicians, presented to the “Digital World of Work” platform as part of the IT summit in October 2016. At that event, there was consensus that further vocational training is decisive for maintaining individual workers’ capacity to be employable, and their and companies’ capacity to take action and to innovate; there was also consensus that those in work have a major need for direction and advice on questions of further training, and that, in particular, there is a need to attain higher participation levels by older workers, by immigrants and by those without a vocational qualification or not having completed it. Co-determination and collective wage-bargaining by employers’ and employees’ representatives were identified as important levers for organising good working conditions conducive to learning and up-to-date vocational-qualification measures. This must also be about investing early, and more intensively, in the strengthening of qualifications and further training and in improvement of opportunities for advancement. This support, including that of the Federal Employment Agency, must take a preventive approach and must not be allowed to only step into action when a person’s job is under direct specific threat.

- With **the amendment to the Career Advancement Promotion Act (AFBG)**, the foundations for professional advancement are strengthened; the course is initially set with the **Act on Strengthening of Unemployment Insurance and of Further Training (AWStG)**. The latter improves access, on the part of workers with low levels of qualification and of long-term unemployed individuals, to a further-training course aimed at a specific vocational qualification. It also makes more options possible for further-training for personnel in small and medium-sized companies, i. e. in those groups that typically have lower levels of participation in further-training activities.
- The Federal Employment Agency is now already active in **consultancy on employment, qualification and further-training, for SMEs and for employed individuals**. A crucial outcome of the “Work 4.0” dialogue process is that the Federal Employment Agency can play an important role in expanding the further-training activities. The Federal Ministry of Labour and Social Affairs’ view is that unemployment insurance should be expanded step-by-step, to become an employment insurance; that way, it makes more preventive support measures possible for those in employment. Important elements in this are the right to an independent consultation on one’s profession and on further training, with the prospect of a right to further training. Further approaches must also be checked, regarding how better to provide assistance on further-training phases, non-continuous paths of professional developments, und switchovers into self-employment – e. g. within the framework of a “personal workforce-member account”.

The dual vocational training system is a supporting pillar aimed at covering the future demand for skilled personnel. What is decisive is a system of training close to actual practice, one that is open to new technologies. This gives a central role to companies, places of vocational training that span across individual firms, and the vocational schools that we want to strengthen as the point of interface for the digital conveying of information.

- Knowledge of new, digital topics, such as “Smart Home”, “Smart Grid” and the “Internet of Things”, is being imparted as an element in a pilot project in the electricians’ trades, using modern learning methods. The results are to be transferred to other trades, as well as a check being made on an adaptation of the regulatory means used for basic and further vocational training.

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- The dual-training-system rulings are being checked in terms of the extent to which new technologies and processes must be taken into account, e.g. in the following areas: IT system electrician; specialist information scientist; commercial specialist – IT systems; and commercial specialist – information-science. In the future, topics such as IT security and software development are to be more firmly anchored in vocational training.
  - New professions necessitate new vocational-training arrangements. Currently the subject-specialist work is under way, preparing the course of vocational training as “Commercial executive – e-commerce”. This will take into account the rise of online trading.

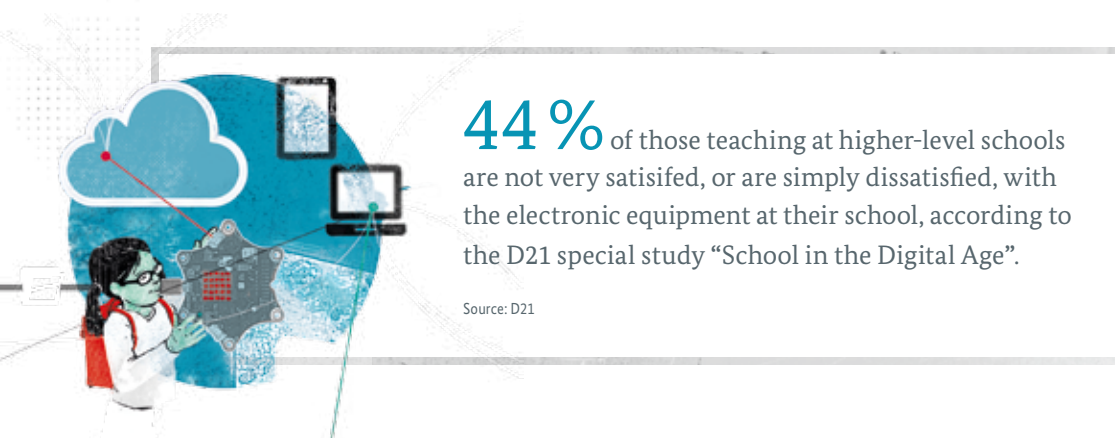
With innovation cycles getting ever shorter, in the future lifelong learning and thus also further training “on the job” will increasingly move into the forefront. The following measures support this:

- The **inter-company vocational training centres** offer high-level further-training courses on digitalisation, thereby adopting an important intermediary function between research and professional practice. To this end, up to 2018 they have EUR 37 million available annually for necessary investments in equipment.
- Like other firms, small and medium-sized businesses ought to recognise and use the potential offered by digitalisation and by qualifying their employees. In this context, the information and consultation offers made by the **Competence Centre on Securing Skilled Personnel (KOFA)** help, also informing people about the funding opportunities for their company-specific further-training activities.
- Players close to the employment market in the regions, such as Federal Employment Agency facilities, job centres, municipalities, chambers of industry and commerce, and associations, have successfully networked in 469 regional alliances, jointly launching regional projects for securing professional skills in their given region. These obtain support through **the innovation office on “specialist skills for the region”**, given financial backing by the Federal Ministry of Labour and Social Affairs. The topic of “Competences for Digitalisation” is gaining significance as part of this and was the key theme for Innovation Day 2017.




- At national political level, the **“Partnership for Specialist Personnel”** in Germany is implementing the “Alliance for Skilled Personnel”, described in the coalition agreement for the Bundestag parliament’s 18th legislative period. The matching of needs to individuals on the employment market, amid demographic and digital transition, is viewed as a joint challenge. For the future, a better monitoring of individuals’ specialist skills is necessary for everyone involved.

Another necessity is a comprehensive, long-term strategy for vocational qualification and further training. Consultation on its implementation should be conducted in the context of a “National Further Training Conference”, involving all Federal Government ministries affected, the Länder (states), the employers’ and employees’ representatives respectively, and other protagonists. The aim is to expand, group together and integrate all strands of further-training activity that involve the Federal Government and the Länder, so as to establish a consistent overall concept.



For the school (and higher education) sector, with the joint strategy “Education in the Digital World”, the Länder (states) have adopted a concept that includes educational plans, the staff’s basic and further training, and also infrastructure and provision of equipment. We consider the following goals to be especially important:

- The children’s IT competence and media competence is strengthened, across all age categories and types of school.
- Young schoolchildren are introduced to digital technologies and to programming at an early age and their enthusiasm is awoken for MINT-related topics. The **Calliope Mini-Computer**, developed with the Federal Ministry for Economic Affairs and Energy’s financial support, makes an important contribution to this. This board is distrib-



uted free of charge to third-year schoolchildren; by the end of 2017, pilot schools are to be equipped with it in all Länder.

- Basic knowledge of information science, of programming and of algorithms are an obligatory curriculum element in primary and secondary schools. The aim is for school to impart what is called “computational thinking”.

We support even closer collaboration between the Federal Government and the Länder than hitherto. Our aim is to use investments to better equip general-education schools and vocational schools.

Graduate-level skilled personnel are an indispensable foundation for our economy’s innovative power and competitiveness – it is a matter of strengthening their digital competence:

- By setting up additional academic chairs of study and by nurturing the already-available top-level institutes for MINT subjects – especially in information technology, and also
- By adopting information science and data analysis as interdisciplinary elements in other specialist areas. Just as digitalisation in the company is no longer solely a topic of the IT department and, from the overall economy’s perspective, it is no longer only a topic of the IT sector, at higher-education institutes, as elsewhere, digitalisation must move beyond the boundaries of its immediate specialist area.

Consumers’ living environment and consumption environment have fundamentally changed as a result of digitalisation. If consumers wish to be and intend to be effective market partners and active members of society, they must be enabled, encouraged and motivated to do this, and given support by a relevant framework. In view of the high level of technological dynamism and the short half-life of knowledge, it is important to have a fundamental media competence with regard to the digital world. For instance, this includes knowing one’s rights and obligations in the digital world; the knowledge of what data is and is not open to one’s own influence; and evaluation of the quality and neutrality of portals, search machines and labels. It is essential to inform people about business models that serve the purpose of researching consumer behaviour but also about how the web can be used in a particularly advantageous way. Individuals in particular social environments, e.g. in socially-disadvantaged areas of their

cities, need particular efforts to enable them to participate in digitalisation. Beneath the umbrella of the inter-ministry **“Social City” strategy** produced by the Federal Ministry of the Environment, Nature Protection, Building and Reactor Safety (BMUB), the Federal Ministry of Justice and Consumer Protection is expanding already-available formats for provision of information, collaborating with the BMUB. The goal is to provide information to consumers in districts of the “Social City”, also in order to achieve greater connectedness for interested parties in such urban districts.

There continues to be a particular need for efforts to strengthen media competence among elderly citizens. In Germany there are now 16.5 million people who are 65 years of age or older. The demographic shift will cause this figure to increase.


Use of technical equipment and digital media is important for older members of the community as a lasting participation in the life of society, as well as for integration into the socially-inclusive environment. Viewed as a whole, use by the older target group is decidedly below the average.



While over **98 %** of young people (aged 14-29) use the internet, only **64,6 %** of 60-69 year-olds do so. Among those over 70, only **29,7 %** surf the web.

Source: D21 Digital-Index – (N)ONLINER-Atlas 2015.

An obstacle for this age group, according to “Consumer Behaviour of Older Citizens”, a report commissioned by the Federal Ministry of Justice and Consumer Protection, is the astonishingly low expectation that this group has of being able to personally benefit from use of digital media. It is noticeable that older people’s technology use is substantially higher if they live together with younger people. If one’s starting point is that technical equipment is suitable to compensate for age-related shortcomings, the conclusion can be made that those who would particularly gain from the technology account for the lowest level of ownership of it and use of it. Strategies of strengthening public information and competence in this subject area should take these insights as their basis. Intelligent approaches must be drawn up to raise the necessary level of switchover from knowing this to actually acting upon this knowledge.




The “**Digital Compass**” project, given financial support by the Federal Ministry of Justice and Consumer Protection, is a portal for information guides, trainers, assistants and other people involved in accompanying the elderly on their path onto the internet. The portal serves the purpose of finding and sharing material, obtaining help and support, as well as of people interacting with and informing one another.

Beyond individual instances of financial support to projects, an overall strategy must be developed for digital participation by older members of society: alongside expanding the web, especially in rural areas, those involved must strive to interconnect existing initiatives directed at strengthening the internet competence and consumer competence of older members of society, at all levels; such projects, especially those fostering socially-inclusive areas, must also be established on a lasting basis. Among other things, this requires a network with a long-term framework of reference and long-term structures.



## 5. Guaranteeing fair competition

Worldwide, digitalisation has a vast effect on conditions of competition. New business models turn existing market mechanisms on their heads. Above all, this applies to the data economy, one that is developing extremely dynamically. Currently, Information and Communication Technology still contributes to economic growth in the USA to a far greater degree than is the case in Europe. Future developments have an open-ended outcome: in what are the fast-moving and mostly global markets of the data economy, young companies can become “global players” within just a few years, displacing the “chickens” that previously “ruled the roost”. To a large extent, competitiveness also depends on a clear regulatory framework. On the one hand, this must provide scope for innovation and investment; on the other, it must guarantee fair competition for all market participants; in cases where adaptation is needed, it must transfer the rights of our social market economy into the digital age, enabling everyone, including small and medium-sized firms, to participate successfully in value creation. Companies need a level playing field, where the



same rules apply for all participants. The establishment of new, digitally-based business models on the market must not be allowed to lead to the emergence of competitive advantages for those companies whose organisational form is geared towards circumventing protective standards that relate to employment law and the law on social-welfare standards, or to avoid taxes and other charges (cf. also Chapter III.2.).

If we wish to shape digitalisation, we have to set up the framework conditions, nationally and internationally, in such a way that fair conditions of competition are created, and that functioning competition is effectively protected against restricting factors. This is the only way that competition's positive forces can take effect, in the digital economy as elsewhere, with regard to prosperity, growth, innovation and (not least) social justice. For those interested to be able to better understand how platform companies function, a Green Book on Platform Companies was issued for consultation purposes.

- The Federal Government has already put into practice insights gained from the “Green Book” process and adapted the competition law by means of the **9<sup>th</sup> Amendment of the Act against Restraints on Competition**. This is done in order that incentives to innovate are secured at the structural level, and to be able to better check possible abuse of market power. In the process of monitoring for possible abuse and of checking mergers, markets can also be included in which no money payments are made directly for services rendered. As is familiar, this is often the case with platform-based business models. The criteria for ascertaining a position of market dominance are now supplemented by five particular factors characteristic of digitalised markets (among others: network effects and access to competition-relevant data). The area of application for the monitoring of mergers is extended so as to be able to monitor purchases by established companies – purchases relevant in competition terms and made at a high price – of companies that have hitherto produced no turnover but are of market significance. Adaptations made to the regulatory framework, to match the challenges of internet-based and data-based economic life, mean the guarantee – continuing into the digital age – of effective protection against abuse of market power, of keeping markets open, and of the fostering of innovations and investments, in the market participants' and consumers' interest.

- The adaptations in the 9<sup>th</sup> Amendment of the Act against Restraints on Competition are the result of comprehensive processes of consultation and discussion, above all in the context of the specialists' dialogue on the digital regulatory framework, the Federal Government/Länder (state) commission on media convergence, and the Green Book on Digital Platforms.
- The results of the broad-based discussions regarding the Green Book culminated in the **White Paper on Digital Platforms**. This publication means that, for the first time, a structure of rules and values is in place for a digital regulatory policy, a structure that is balanced in economic-policy terms and is also viable. This is because a Digital Single Market with its 500 million Europeans needs a uniform European legal framework. This must foster fair competition at all levels. It must establish incentives for a pioneering data economy, in addition to digital infrastructures with gigabit capabilities, everywhere. All members of society need to be able to participate in this growth and be enabled to interact with these innovative technologies in a self-assured and democratic way. Ultimately, state institutions must also be able to fulfil their tasks competently in a digital and networked world. The proposals and policy positions, stated in this regard in the White Paper, provide (among other things) for a level playing field in telecommunications markets, fundamental obligations for digital platforms to provide transparency and information, and a high level of state financial support for expanding the network. The White Book was preceded by four months of consultation in which companies' representatives, associations and other interested parties from all realms of society were able to contribute their insights and wishes.
- Likewise, the **Specialist Dialogue on the Regulatory Framework** serves the purpose of a targeted and broad-based exchange of views on central challenges faced in setting up a digital regulatory policy. Politicians, scientists, representatives of trade unions and associations, stakeholders and the public as a whole are involved; at large-scale specialist meetings and in interdisciplinary studies, they discuss current developments, long-term trends and important approaches towards establishing rules and a framework for digital business and the digital society.
- In an intensive process, the **Federal Government/Länder (States') Commission on Media Convergence** has made a valuable contribution to an up-to-date means of regulating the media. The final report

includes the results on issues put to vote, for a convergent regulation of the media, in the activity areas of the Audiovisual Media Services Directive, protection of youth in the media, the regulation of platforms, in addition to intermediaries, cartel law and the safeguarding of diversity. A lot of the recommendations for action for a regulation of the media take into account the changing patterns of media use, for instance aiming at a diverse and attractive offering of media material, and fair conditions of competition. Parts of the final report have been integrated into the 9<sup>th</sup> Amendment to the Act against Restraints on Competition (see above).

- Likewise, electronic communication requires a viable European legal framework for the future. This should be dealt with as a priority task within a general single-market strategy. In September 2016, the European Commission submitted a specific proposal on this, with its draft **European Electronic Communications Code**, which is being worked on in Brussels as a matter of urgency. A lot of inputs from Germany have been integrated into the Commission's proposal. Our core goal is a digital regulatory framework that is investment-friendly, flexible, legally secure and viable for the future, with regard to the technical and economic developments to come over the next ten years, a framework that opens up our path into the gigabit society.








## 6. Securing and expanding data sovereignty and data protection

Innovation and growth in the digital economy and the comprehensive protection of personal data, as well as data sovereignty, are two inseparable issues. Freedom and self-determination are now unthinkable in an open society without protection of privacy and of personal data. Economic and technological progress will be successful only if individuals, not least as consumers, can have trust that they retain control over their data and that they are protected both against abusive processing of that data and third parties' unauthorised access to it. Surveys regularly show that around 75% of all users are concerned about their privacy in the internet, worrying that their personal data is being misused or passed on without their authorisation.

An important step on the path to improved data protection, strengthening data sovereignty, is the **EU General Data Protection Regulation**; this was passed into law in May 2016 and will harmonise data protection law in Europe to a very large degree as of 25 May 2018. It will create a uniform,



high level of data protection throughout Europe, containing the principles of transparency, purpose limitation, and data minimisation. The Regulation implements the basic right to the protection of individuals in the processing of personal data, effecting a balance between consumers' interests and legitimate commercial interests. A building block in this is reinforcement of use of data pseudonymisation. For data specific to individuals, such as this, the General Data Protection Regulation provides for some elements of privileged status, without putting into question the user's self-determination in information terms. The "lex loci solutionis" (market location) principle sees to it that each company economically active in Europe must adhere to European data-protection law – regardless of where the company is based; in this context, an effective regime of supervision and sanctions strengthens law enforcement. This creates equal conditions of competition and protects the rights of individuals in the EU. So as to adapt German data-protection law to comply with the General Data Protection Regulation, the Federal Data Protection Act has now already been completely reworked. In this respect Germany is Europe's front runner.

Thanks to its high level of data protection, Europe is setting standards worldwide. This is also evident not only in the fact that more and more countries are introducing data-protection laws. There has also been success in strengthening data-protection from the human rights perspective, at United Nations level. Based on a German-Brazilian joint initiative, in a resolution (A/RES/71/199) the General Assembly established milestones for effective data-protection in relation to the processing and use of data by state bodies and by companies.

For consumers' commercial freedom of action, **scoring** (e. g. by credit-inquiry agencies) is of major significance; for instance, this determines who gets a mobile-phone contract or a rental contract and who does not. We have retained the consumer-rights core of the rulings, on scoring and on the activities of credit-inquiry agencies, that were included in the Federal Data Protection Act. In the future, as now, nobody needs to fear negative consequences for their perceived credit-worthiness if they raise an objection to a demand for payment. We will check whether, in the future, in view of credit-inquiry agencies' major significance for the economy and for consumers, there is a need for rulings of even greater detail (e. g. in the form of a law on credit-inquiry companies), so as to guarantee the quality of their work and protection of consumers.

The General Data Protection Regulation is technology-neutral and thus formulated in very general terms; in actual practice, in the years to come it will have to be put into specific terms by the public supervisory authorities and particularly by the European Commission data-protection bodies. However, because of the dynamism of many technical developments, we ought to check whether legislators at European level – as in the area of electronic communication – should also set up rulings specific to this activity. The aim in this is to strengthen people’s trust in new technological developments and to create legal clarity for business, by means of a reliable legal framework. For instance, it is worthwhile to consider special rulings on data processing in the Internet of Things.

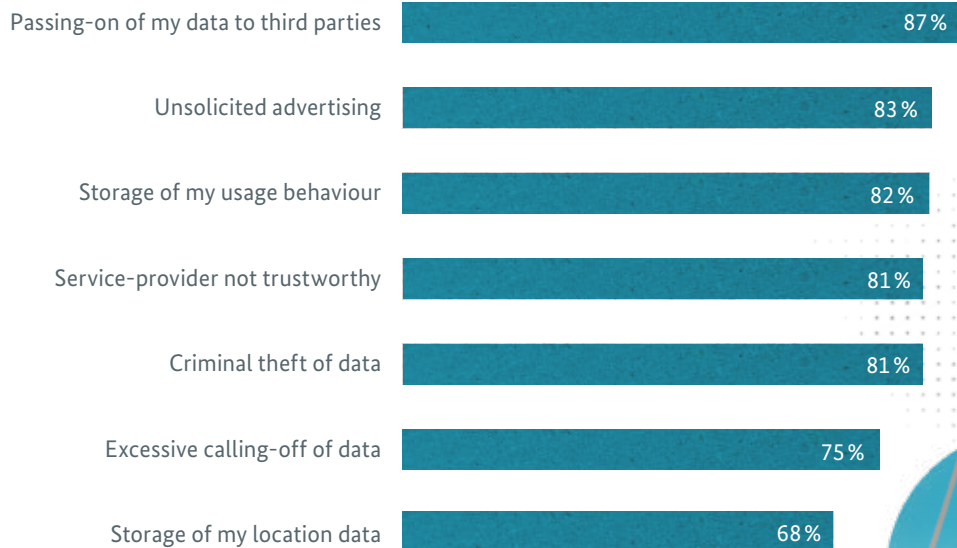
The General Data Protection Regulation intentionally allows scope for national legislators to better protect genetic and biometric data, as well as health data, in addition to applying stricter conditions to any consent to processing of this data. Wearables and health apps, notably, obtain a lot of revealing and particularly sensitive data about people’s health, without individuals involved having an overview of the implications. Therefore we will check how, in information terms, individuals can have greater self-determination in this regard. The same applies to the processing of such data in the context of highly-individualised payment rates for insurance. The principle of pooling of risk, one that shapes the business of insurance, must not be allowed to be undermined, in such a way that favourably-priced insurance is made available only to healthy people prepared to surrender their privacy. In the statutory health-insurance system, use of this data is to a large extent ruled out; however, this must also apply to private insurance companies.

A further important building-block for data sovereignty and effective data protection will be the **ePrivacy Regulation**. The Commission’s draft is currently in the deliberation stage. The proposal aims at a new, directly-enforceable, uniform legal framework for respecting individuals’ private lives and the protection of personal data in all forms of electronic communication. It is to be welcomed that, in the realm of data protection in electronic communication, as elsewhere, a level playing field is being established for all market participants. All services, including internet telephone use, web-mail services or messenger services offered to end-users in the EU, are to be subject to the same requirements. Guaranteeing the confidentiality of electronic communication and a high level of data protection form the core concerns of the ePrivacy Regulation. Among other aspects, in order to strengthen the user’s sovereignty it includes

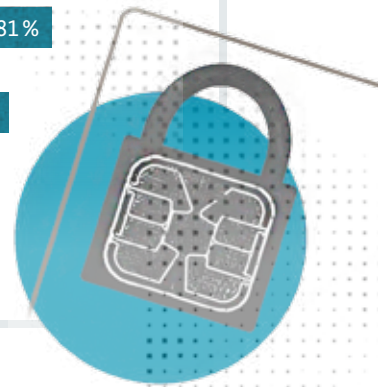
requirements restricting access to the end-devices' memory and processing capacity, as well as requirements on privacy settings, issued to manufacturers of internet-access software.

## Concerns about misuse of personal data

Which concerns cause you not to make use of online services if required to provide data?



Source: Bitkom Research, 2015. Representative survey in two waves (1,013 and 1,009 internet users in Germany aged 14 or more)



There can only be data sovereignty when we take into account the reality of users' lives. In everyday life, people cannot read declarations of consent that span many pages. They need to be informed in a to-the-point, compact way. Therefore we will put our resources behind a proposal for the European Commission to use its right, according to the General Data Protection Regulation, to establish standardised pictograms in order to visualise processing-information, as soon as possible. Companies can use them on a voluntary basis, to inform the person affected concerning the most important aspects of the processing of their data. We have also been able to get companies, associations and organisations, taking part in the national IT summit, to develop the concept of a **“one-pager”**, summarising the data-protection notifications in a user-friendly way, simply and in concentrated fashion.


By now, a number of companies, some of them large and well-known, use this **“one-pager”** in a whole range of versions.

However, we also need to consider how technical solutions can render support to people as they exercise their self-determination with regard to information, e. g. by programs stating the processing preferences automatically, or conversely by programs assessing conditions of data-processing on an automated basis and providing help in setting them.

This is why we commit ourselves to data-protection-law issues already being taken into account when products and services are being designed, and implemented in a user-friendly way; this involves adherence to standards, with support and the guarantee assurance being able to be checked by the consumer, prior to purchase. The rulings stated in the General Data Protection Regulation, governing “privacy by design und by default” set the correct path. This is also what we strive for in international standards. Notably, this is evident with regard to networked everyday items, such as the smart TV or personal assistance systems. Here users must have the possibility to decide for themselves which data from such a device can be stored and processed, when, and by whom. As part of this, it must be ensured that such devices’ hitherto-analog basic functions remain usable. There must be no impermissible **coupling** of the opportunity for use of devices and services to a processing of the data. Preconditions for this are alternatives of equal value, freedom of choice, and competition. We have drawn up principles accordingly, jointly with the business community, at the latest IT summit. Likewise, in the deliberations on the ePrivacy Regulation, we will take particular account of the “privacy by design and default” aspects.

The General Data Protection Regulation has introduced the right to data portability, i.e. users’ right to transfer to another provider the personal data that they provide.





This strengthens users' economic self-determination and also boosts competition. As soon as the data-portability right is in force, starting in May 2018, we will check whether it is sufficient in practice; if necessary we will commit our efforts to improvements.

Any law is only as good as its enforcement. Therefore the General Data Protection Regulation provides for deterrent sanctions, comprising up to EUR 20 m. or 4% of the company's global annual turnover. For individuals, it is in many instances too arduous and costly to enforce their rights in relation to major companies. This is why we have extended **the associations' right of legal action regarding data-protection violations** to certain groups of cases; we will observe whether the experience gained in practice justifies a further expansion of associations' right of legal action.

A further building block in protection of data not generally accessible (e.g. credit-card information), is the introduction, launched in this legislative period of the Bundestag parliament, of the criminal offence of **unlawful trading in data**. This ensures that it is subject to prosecution to trade data if such data has been obtained by means of a criminal offence. The role model here was "classic" handling of stolen goods, i.e. the prosecution of those selling stolen items. For companies the issue is primarily that of protecting their own infrastructure – e.g. networks, servers and computers – against external attacks. Notably among small to medium-sized enterprises (SMEs) there is much catching up to do. A quarter of them do not even secure their data – or do so only very irregularly. Combined with often inadequately-protected computers and networks, SMEs are thereby an easy target for harmful software – viruses, Trojans, worms and other attackers that inflict substantial damage – throughout the German economy, around EUR 51 billion per year.

Therefore the German SMEs must be put into a position to protect themselves against dangers in the internet, through tailor-made initiatives and solutions. Only in this way can they use the digital transition's opportunities to the full extent.


The initiative "**IT Safety in Business**", by the Federal Ministry for Economic Affairs and Energy, is directed to SMEs in a targeted way, to render support to them in safe use of their ICT systems. With IT security experts' help, specific measures are developed on-the-spot for improving SMEs' awareness of IT security issues, on a lasting basis. However, the initiative's goals go far beyond direct on-the-spot support to SMEs: what is on the agenda is

the strengthening of the national and European IT security business. The aim is also to establish a uniform foundation for designating IT security characteristics as having a seal of good quality and having certificates. The initiative's focus also includes the future all-embracing use of electronic encryption in business.

The **“Trusted Cloud Platform”** gives users a rapid overview on cloud services that match the “Trusted Cloud Label” criteria – i.e. they are trustworthy and fulfil the requirements on transparency, security, quality, and conformity with the law. The label emerged in the context of the Federal Ministry for Economic and Energy's “Trusted Cloud” technology program, where the relevant issue was the development of innovative and secure cloud-computing solutions. By now, “Trusted Cloud” collaborates with the French initiative “Label Cloud” and the Dutch initiative “Zeker Online”; cooperations with further European partners are planned. Jointly with the European Commission, the goal is to harmonise the requirements for secure cloud services EU-wide.

An important prerequisite for acceptance of digitalisation in the world of work is trust in employers' data protection for employees. This is confirmed not solely by surveys among the public, but also by the Federal Ministry of Labour and Social Affairs' “Work 4.0” dialogue process, in which many people involved declared their support for independent data-protection arrangements for employees in Germany.

Here also, the **EU General Data Protection Regulation** gives national governments the opportunity to further specify data-protection provisions in the employment context; in particular, this includes: the right to ask questions concerning justification of the decision to employ a given person; the explicit ruling-out of secret monitoring in the employment relationship; limitations imposed on monitoring employees' locations; and also limitations on comprehensive profiles of movements; the ruling-out of longer-term supervision measures; and (ruling-out) the use of biometric data for authentication and authorisation purposes. The Federal Ministry of Labour and Social Affairs (BMAS) would like to make comprehensive use of these areas of scope for country-specific rulings. It wishes to set up an interdisciplinary advisory board with the function of preparing these independent statutory rulings on data-protection in relation to employees, based on a review of current status. In addition, the BMAS will check whether there is a need for legislative action on the subject of co-determination rights held by a given company's advisory board.



The BMAS also wants to promote application of the law through scientifically well-founded yardsticks of quality and practical recommendations that can help companies and advisory boards, especially in SMEs, to implement statutory data-protection in actual practice.





## 7. Advancing the digitalisation of small to medium-sized enterprises (SMEs); using the innovative power of start-ups

Digitalisation is massively changing our economy. Using new business models, innovative and fast start-ups are driving developments forward. For tradesmen and small to medium-sized businesses, as for others, digitalisation offers major opportunities: intelligent production procedures boost productivity and efficiency. They enable individual customer wishes to be accommodated, new markets to be tapped into, and wholly new products and innovative working structures to be developed. Nevertheless, knowledge of the opportunities and options for use of digital innovations and practices remains limited, especially among SMEs. Targeted support in the digitalisation process contributes to the enormous potential, offered by digital applications and Industry 4.0, being able to be used for Germany as a business location. Primarily this is about highlighting good examples to small and medium-sized firms and to company founders, and also creating test opportunities for them with regard to innovative products and services, yet also advising them on new personnel-development issues and on the quality of work.

**64%** of small to mediumized firms use cloud computing services in 2016. This is

**12 points percentage** more than in 2015.

Source: Bitkom Research, Cloud Monitor 2017.



- Specific assistance is on offer from the “SME Digital” priority area in Federal Ministry for Economic Affairs and Energy support, which emerged in the context of the Digital Agenda, via the Ministry’s **SME 4.0 Competence Centres** and **SME 4.0 Agencies**. Ten competence centres distributed throughout Germany, and a Digital Craftspeople Competence Centre, accompany firms as the latter introduce digital applications and electronic business solutions. There, SMEs have the possibility to obtain information and to test out their own technical developments, under professional guidance. They also obtain assistance on questions of security and of commercial assessment of measures aimed at digitalisation. Further competence centres will be added in 2017. Supplementing this, four **SME 4.0 Agencies** impart their knowledge to companies on topics relevant to everyone, such as cloud computing, process optimisation, communication and commerce. Nationwide, these agencies provide their expertise on technology transfer that is suited to SMEs’ circumstances, to multipliers such as chambers of commerce and associations, as well as to the SME 4.0 Competence Centres.
- The offers of information and consultancy made by the **Initiative “New Quality of Work” (INQA)** are being expanded and directed at the World of Work 4.0 to a greater extent than hitherto. Also being extended is the **People as Company Assets (uWM)** programme, rendering support nationwide to small and medium-sized firms in setting up their personnel arrangements to make them viable for the future. Here SMEs get the opportunity to establish a learning area and experimenting area in their company.
- Targeted consultation for SMEs and for tradespeople in two model regions is the purpose of **Go-digital**. The participants obtain accompanying support from authorised consultancy companies, individually and

comprehensively, from the initial analysis through to the implementation of specific measures on the topics of IT security, internet marketing and digitalised business processes. This model project is becoming a nationwide programme with a support budget of EUR 10.38 m.

- Culture and creativity have by now become an important economic sector in their own right, also serving as an engine of innovation for technological and digital developments. The new **Competence Centre on the Cultural and Creative Sector** initiated cooperations between the creative economy and other sectors, promoting transfer of innovation across various industries' boundaries.

Start-ups' innovative power is decisive in driving forward the digital transformation of the whole economy. With their rapidly scaleable solutions and business models, they are important engines of growth and job-creation. What start-ups frequently lack in implementing their ideas is growth capital and access to established companies. In addition, a whole range of offers of consultancy are aimed at rendering support on entrepreneurship-related questions relating to company formation and growth. We are well set-up with regard to the early-phase financing of start-ups. Yet compared to the strongest markets in this activity area, Germany's venture-capital market still has some ground to make up – especially with a view to the particularly capital-intensive financing steps during the growth phase. The Federal Ministry for Economic Affairs and Energy provides support to start-ups with regard to financing in various phases and through tailor-made programmes.

- Provision of financial support to start-ups already begins in the company-formation phase. Here the issue is primarily that of improving the framework conditions that apply to the venture-capital market. The **EXIST** programme renders support to company formation at higher-education institutions, for instance with grants for formation of a company, as well as research transfers.
- During the growth phase, start-ups mostly have a major demand for capital, without being able to demonstrate a sufficient level of credit-worthiness or yet being able to make avail of their own profits. Using state funds, but also through private investors' targeted incentives, start-ups can obtain support in this phase. The **High-Tech Company Formation Fund** provides targeted financial assistance to young companies that make an important technological contribution to the digi-

talisation of the economy. The plan is that a fund volume of EUR 300 m. is to be reached by the end of 2017, with 30% of this coming from private funding. 440 start-ups have already received initial financing in this way. The co-investment fund **coparion** was founded through European Recovery Program (ERP) special assets and the KfW banking group. It has a volume of EUR 225 m. at its disposal and finances start-ups and young technology companies, with the same amount and on the same economic conditions as a private lead investor would. The venture-capital grant **INVEST** provides support to young companies in the search for a provider of capital, and motivates private investors to make venture capital available. Starting this year, the investment sum for Business Angels, eligible for financial support, comprises EUR 500,000. The EU also supports start-ups with financing: the **ERP/EIF growth facility**, set up jointly with the European Investment Fund and holding a volume of EUR 500 m., makes finance available to venture-capital funds and fund managers, in order to refinance co-investment funds that they manage. The **ERP/EIF umbrella fund** takes a stake in venture-capital funds that invest in technology companies in the early phase and growth phase respectively. The **European Angels Fund** offers co-financing for experienced Business Angels' investments. In total the funds have EUR 2.7 bn. at their disposal annually.

Alongside the financial support, it is particularly important to link established companies up with start-ups striving to make progress. In this process, the "Young Digital Business" advisory board at the Federal Ministry for Economic Affairs and Energy makes an important contribution, advising the minister on digitalisation matters, with specific recommendations for action, as well as initiating projects. Promoting dialogue and forming networks that link young and established entrepreneurs is very useful to both sides.

- The **Digital Hub Initiative** plays an important role in this, rendering support to the emergence of digital hubs in Germany. The basis of the hub idea is that German and international company founders, scientists, investors and established companies network together and strengthen one another. The

Some progress:

**13,9%**

of the start-ups in Germany in 2016 were set up by women. This continues the growth trend evident over the last few years.

Source: Bundesverband Deutsche Start-ups e.V., 4. Deutscher Start-up Monitor, 2016



aim behind using a hub agency as a communications agency is to raise these locations' international appeal in the digital start-up scene.

- The **start-up nights**, taking place several times per year, are a successful series of events: young companies and established companies from specific sectors of business present their business models, network and initiate cooperations.
- The **company-founder competition “Digital Innovations”** helps potential company founders: with advice, provision of start capital and support in matching them up with established firms, SMEs and potential investors. For seven new rounds of competition, over the period 2016-2019, EUR 2.3 m. are to be disbursed each year.
- The **German Accelerator** renders support to young German firms from the technology sector in building up a network in global start-up hubs in the USA. A further internationalisation of start-ups is promoted by the programme **EXIST Start-up Germany – Israel**. Technology-oriented Israeli graduates founding a start-up in the Berlin capital-city region gain access to EXIST. This set of programmes is also intended to be expanded to other global regions and to other German start-up regions.




## 8. Top-calibre digital technologies

Innovative digital technologies, such as robotics, 3D technologies, Big Data analyses and autonomous systems offer huge opportunities for the German economy. The global battle for innovations is fierce. With targeted offerings of financial support directed at the development of new digital technologies, the Federal Government supports business, in order for Germany to become leading provider of these ground-breaking new technologies.

The aim is to pick up on future themes in information and communication technology at an early stage, and to accelerate the transfer of scientific results into market-oriented cutting-edge technologies with rich potential for application. This is why, in financial-support projects, the technical feasibility and commercial sustainability are tested out jointly with partners from the science community and their ability to be converted into reality is tested with model users. The results flow directly into new commercially-viable products, applications and business models.

One area of emphasis is the intelligent use of data. In the digital age, data is the raw material for commercial value creation, for innovation and growth. Companies face the challenge and the opportunity of efficiently deploying a quantity of data that is growing all the time. Notably for SMEs, the potential is enormous: Big Data can serve as the dynamo for innovative business models and products. The demographic shift is another factor offering Germany a particular chance. A inter-ministry “Work 4.0” strategy for innovation, research and opportunity-transfer could contribute to making Germany a leading provider and user of digital systems and applications that foster a healthy way of working.

- The “**Smart Data – Innovations from Data**” technology programme renders support to showcase Big Data projects that are developing innovation services in this activity area. This programme is given support by the **Smart Data Forum**, through networking at European and international level, through the integration of further stakeholders, as well as through the building-up of a demonstration area and experience area for smart-data solutions.
- The development of Smart Services opens up numerous new opportunities for companies, as well as for individuals: Smart Services are used not only in manufacturing but in all digitally-networked business areas, such as logistics, the energy business, the health sector, finance and the media. The programmes “**Smart Service World I**” and “**Smart Service World II**” render support to projects, the aim being to establish such new intelligent services in the most diverse range of areas of life and the economy. The programme “**Smart Service World – Internet-Based Services for Business**” focuses on innovative projects from the activity areas of production, mobility, and good living. The companies from various sectors and the research institutes develop prototype solutions: based on networked, intelligent technical systems, these gather and analyse data, and make new services available via service platforms, app stores and other online market-places. With “**Smart Service World II**”, the topics addressed are (in particular) employment, mobility, home living, and basic provision of resources, with the emphasis on rural areas.
- (Private) buildings are also becoming safer, more comfortable and efficient, because of smart data and smart services. The **Smart Living** economic initiative, supported by the Federal Ministry for Economic Affairs and Energy, seeks to draw together collaboration, spanning



various business sectors, in the “Smart Home” market of the future. This is primarily about converting ground-breaking approaches to solutions in the smart-home sector into products viable in the market; it is also about creating acceptance for existing solutions and gaining progress in getting qualified experts trained in this activity area.

- How can innovative and new technologies be purposefully linked up, thereby contributing to a dynamic process optimisation? Relevant approaches to solutions are developed in “**PAiCE – Digital Technologies for Business**”. The development goal is approaches to solutions for drawing together various fields of technology in value-chains. This spans from product engineering, via agile logistics and 3D technologies, through to service robotics. The goal is also to develop solutions for safe, real-time-capable communication (including tactile internet) for broad-based use in industry. The financial-support programme, with a budget of around EUR 50 m., is primarily directed to SMEs and to their profile of needs.

Electric mobility is an important topic for Smart Cities and likewise for Germany as an automotive location. The objective is not only for Germany to develop into the leading market for electric vehicles. By integrating these vehicles into the electricity grids and traffic networks respectively, Germany can also establish itself as a leading provider for electric mobility.

- The basis for all important functions in electric vehicles and for their integration into viable mobility concepts for the future is modern Information and Communication Technologies (ICT). The goal for the Federal Ministry for Economic Affairs and Energy’s “**ICT for Electric Mobility III**” programme of support is to identify commercially rewarding applications in the commercial-vehicles segment. At the heart of the research projects are ICT-based innovations in the realm of vehicle technology, as well as all-encompassing concepts for logistics, energy management and vehicle charging. A further point of emphasis is the integration of electric vehicles into intelligent traffic concepts. Likewise, the **PEGASUS** project is aiming at automated driving, as the force behind innovation and value-creation; it promotes the development of test methods for highly automated driving, especially on motorways.





## 9. Digital connectedness, access and participation

Digitalisation is placing major demands on modern data infrastructures. Just as previously a region's economic success substantially depended on its transport infrastructure, today it is data networks that decide how successful a given business location is. Regions without availability of fast internet lose out on attractiveness and economic power. This is why Germany needs provision of broadband across-the-board, as quickly as possible, with at least 50 Mbit/s.

In the medium-term, even this will be insufficient. Digitalisation is striding ahead more and more rapidly – placing ever greater demands on the data networks: more capacity, better availability, faster data transmission. So the goal must be to build up a data network truly capable of meeting the future's needs.

- The Federal Government and Länder (states) are providing financial support to the expansion of the data networks – both for private



households and for business. Around EUR 4 billion in total are available for linking up private households to the broad-band network. Financial backing amounting to EUR 350 million is going to the expansion of gigabit infrastructures specifically for industrial estates, from the “**Special Funding Programme – SMEs**”. In addition, an investment fund of around EUR 10 billion for projects establishing gigabit networks is planned specifically for rural areas. The objective is across-the-board, high-performance digital infrastructure, fostering better economic prospects and inclusion in society.

- High-performance data networks also include the build-up of public WLAN networks; as far as is possible, these enable users to access the internet everywhere in an uncomplicated way when out-and-about. The adopted Federal Government draft for an **amendment to the Telemedia Act** creates legal security for WLAN operators wishing to offer their customers free WLAN. The draft act establishes liability rules for when WLAN hotspot users violate current law. On the other hand, the aim is for WLAN hotspots to be able to be offered without a password being needed.
- Hitherto some network providers solely permitted use of their own internet routers for their customers’ broadband access (“lack of router choice”). To enable a free choice of equipment for consumers and simultaneously to create greater competition, we have introduced a **statutory rearrangement**: (for customer contracts starting on/after 1 August 2016) customers can connect routers of their own choice that match the fundamental requirements. To make this possible, the providers must make available to their customers the access data and information necessary for the connection, unprompted and free-of-charge; this is in order to be able to set up access to the contractually agreed services.

High-performance networks are a basic prerequisite for innovative, networked applications such as Smart Home, E-Health or intelligent energy grids. In education, health, energy, transport and administration, applications like this enhance individuals’ quality of life, make our country more sustainable and environment-friendly and strengthen our economy’s competitiveness.

- The Federal Ministry for Economic Affairs and Energy’s “**Intelligent Networking Initiative**” offers members of the public the opportunity to submit their own innovative proposals and projects via an open innovation platform. The initiative also fosters networking among protagonists

in Federal Government, the Länder (states), and municipalities respectively, assisting with the digitalisation of important infrastructure areas. Beyond this, the financial-support programme “**Model regions of intelligent networking**” renders support to regional concepts and projects that foster use of ICT, spanning across different business sectors, in education, energy, health, transport, and public administration.



Around **EUR 56 bn.**  
of potential for the overall economy can be converted into reality through intelligent networking.

Source: Bitkom, study “Gesamtwirtschaftliche Potenziale intelligenter Netze in Deutschland”, <http://bit.ly/2eAh7If>

- Another beneficiary of intelligent networking is the energy transition: the **Digitalisation of the Energy Transition Act** means that smart-meter gateways are being introduced according to BSI standard. This technology, developed in Germany, makes standardised communication possible between energy producers and consumers, offering “Privacy & IT Security by Design”. This could make Germany into a front-runner in the area of Smart Grid, Smart Meter and Smart Home. The financial support programme “**Smart Energy Showcases – Digital Agenda for the Energy Transition (SINTEG)**” is about innovative network technologies and network operating concepts in energy provision: e. g. system integration of renewable energies, flexibility and stability of energy provision, energy efficiency, and intelligent energy grids.



## 10. Copyright in the networked and digitalised world

In copyright law, we are committing our efforts on behalf of the creative people who are at the start of the cultural value-chain. Increasingly, creative content is consumed in the internet via digital platforms. For creatives, this results in new digital sales channels and sales markets – but also risks. We want to see to it that the values created in this chain are shared fairly among all participants. Alongside the creatives, this includes all who ensure that the services do indeed reach the public: e.g. publishing-houses, labels and platforms.

For this to be a success we must neither only see risks posed by digitalisation and networking, nor must we solely resort to old, familiar patterns: after all, e-books are not merely unprinted books. A new state of affairs need new solutions, not simply the continuation of existing models.

Simultaneously, changes entail opportunities. Never before has the world had so much high-calibre copyrighted content available for so many people and never before was the demand for creative content so great.


The printed book and the record, the tape recorder, the radio and the television – in all cases, these once-new, disruptive business models gave rise to a lot of fear, yet ultimately the net result is that they have all led to greater cultural creativity and to more areas of activity for creatives. The budget and the public’s attention span are limited – in a cultural and creative business arranged around the market economy, this is reflected in the price, and thus ultimately also in the company’s development and in fees for creatives.

Our task is to integrate these changes into copyright law.

- With the new **Copyright Collecting Societies Act**, we have modernised the collective perception of rights – in the interest of the creatives and of the companies in the cultural business sector, yet also those of the users, able to acquire necessary rights from a single source. Notably in the context of digital forms of use, characterised by small units of use and necessitating the acquisition of many and varied rights, copyright collecting societies have an important role to play.
- The reform of the **copyright contract law** means that creatives obtain better information about the use of their works, including the period beyond the immediate contractual relationship – especially in the digital environment, this is an important lever for enforcing fair remuneration. A right to legal action taken by an association ensures that, like other agreements, collective agreements can also be enforced.
- With the draft of the **Copyright-Knowledge Society Act**, we have set up the prerequisites for making it easier to use content for teaching and research and to structure it in a technology-neutral way, without unduly restricting the legal owners’ rights.

At European level we are actively taking part in the efforts to get EU copyright law equipped to deal with a future Digital Single Market:

- We have gained a first success, attaining agreement on the **Regulation on Cross-Border Portability**: in future, subscribers to online services can use them on a temporary stay in another EU country without needing to fear “geoblocking”.
- For the visually-impaired, electronic aids create whole new opportunities for access to books and other texts. By implementing the international **Marrakesh Treaty** in the EU, we establish the preconditions



for making **barrier-free audio books** available to blind/visually impaired people via the internet.

- We are intensively working on a proposed regulation for creating better EU-wide **access to television and radio programmes**.
- The draft directive on **Copyright in the Digital Single Market** aims at various topics, for instance cross-border use of copyright-protected content for tuition purposes; protecting the interests of the printed-version's publisher, or digital platforms' responsibility according to copyright-law. This challenge here is to balance -out very diverse interests held by many parties involved.

A lot remains to be done. In copyright law, as elsewhere, we cannot rely on old certainties in a changed world. A good 50 years ago, in 1965, a German legal invention, namely private copying that was legally permissible but simultaneously remunerated on a fixed-fee basis, partly revolutionised copyright law – and served as a role model for many other countries. Charging for a benefit rather than banning it – that was a progressive idea. For copyright in the 21st century we must continue to work at reaching solutions appropriate to our times.



# IV.

## International cooperation



Digitalisation is an engine for innovation and participation, offering vast opportunities to society and the economy. Yet it is also one of those great challenges of our time that we must address globally. National go-it-alone policies are insufficient for shaping digitalisation globally in a successful way. What are needed are cross-border alliances, cooperations and sets of rules.




# 1. European sovereignty and the Digital Single Market

Europe's development towards a gigabit society must be driven forward actively and accompanied by political measures. A common regulatory framework, establishing the guiding principles for the digitalisation of business and society throughout the EU, is of fundamental importance for our global competitiveness. Yet it is not solely for the ICT industry that greater connectedness and compatibility yield substantial productivity gains. Other sectors such as finance, manufacturing, logistics and commerce, benefit from the digital transformation. In 2010, the European Commission identified seven priority action areas in its Digital Agenda. The top priority is a European Digital Single Market, one in which high, shared standards are set for security, consumer protection and data protection, but one in which workers' rights must also be protected.

- In order to implement the **Strategy for a Digital Single Market (DSM)**, the European Commission has been submitting specific proposals since December 2015, step by step. It is pursuing three fundamental goals in this: enabling consumers and companies throughout Europe to have better online access to goods and services; creating suitable conditions for flourishing digital networks and services; and capitalising, in the optimum way, on the European digital economy's potential for growth. The Federal Government is actively and constructively accompanying the relevant political processes and legislative changes. So that the political developments can keep pace with the changes in technology, the steps stated in the DSM strategy need to be implemented promptly, yet also thoroughly. First successes are already in sight on the path to completion of the Digital Single Market. January brought what to a large degree was the abolition of **roaming charges**, effective as of June 2017. The Federal Government has long since been pursuing this outcome.

Europe-wide securing of availability of skilled personnel is an important goal for the EU's Digital Agenda; the EU primarily approaches this topic from the perspective of basic and further vocational training. However, and paralleling the dialogue process "Work 4.0" in Germany, the aim is to make the approach more extensive in its scope, taking into account the various dimensions of good digital work.

- One common approach by the European Member States, applied in order to guarantee good work, should consist of **minimum standards**



for employees, enforced throughout Europe. To achieve this, it is essential to have European legal frameworks for national minimum wages and systems for securing individuals' basic material needs, and also better minimum standards of labour mobility within Europe. As regards digital platforms for work, we are striving to attain minimum standards regarding conditions of employment, social-welfare provisions, and income, for workers offering their services via online platforms. This also includes protection of sovereignty over one's own personal data, for those working via platforms. The aim is to protect workers, rendering services via work platforms, from inappropriate observation and from inappropriate passing-on of their personal data. Consistent with tried and tested European practice, the structuring of these legal frameworks must form part of the Member States' remit.

- Likewise, at the European level, there should be deliberation of what consequences digitalisation has for occupational safety, e.g. regarding the changed opportunities that workers have, technically and in terms of organising the work, for working on a mobile basis with time-flexibility, yet also with the related mental burden imposed by working without the previously existing limits.

## 2. **Germany's presidency of the G20**

“Shaping an interconnected world” – this is the slogan for Germany's G20 presidency in 2017. This is because digitalisation is an important success factor for strong, sustainable, balanced and inclusive growth in the world economy. For companies to remain competitive worldwide and cooperate with one another, prerequisites for global Industry 4.0 are reciprocal knowledge transfer based on fair conditions, uniform standards and comparable framework conditions. Our goals are a level playing field for companies and high consumer-protection standards worldwide. Thus far, internationally there are hardly any strategies as to how best to deal with digitalisation. Important areas such as the safeguarding of cyber-security for ever more complex global value-chains, the enforcement of consumer rights across national borders, or international data-protection rules, must be taken into account in the framework conditions for world trade. This is why, at international level and in dialogue with other industrial nations, we commit our efforts to advancing the process of digitalisation of business.

- At the **meeting of digital-policy ministers** in April, the G20 partners agreed on common goals and principles, as well as establishing an intensive dialogue. Everybody is to have internet access by 2025 and gender equality among internet users is to be achieved by 2020. Among other areas, the G20 partners see the following as priorities: the provision of support to new business models and start-ups; fostering small and medium-sized firms; strengthening of trust and online consumer protection; the further development of Industry 4.0, as well as provision of support to digital education initiatives. On digital trade, the G20 group will urge the international organisations not to set up any new trade barriers, and ask them to submit proposals for abolishing existing barriers.
- At the **G20 Consumer Summit** in March 2017, Consumers International and the Federation of German Consumer Organisations handed over to the German presidency “The consumers” movement’s recommendations to the G20 governments”. These contain comprehensive proposals for a consumer policy in the digital world; they were also deliberated upon at the G20 conference of digital ministers.
- At their meeting in May, the **G20 employment ministers** made the “future of work”, in the digital context, the focus of their deliberations. Important impetus, generated by the dialogue process involved in the White Book on “Work 4.0”, will also be discussed within the G20 partners’ circle in the future. The goal is to prepare the G20 labour markets, with their variety of starting positions, to tackle the future of work. The G20 partners wish to systematically strengthen further education and lifelong learning. In this context, the plan is to strengthen the role taken by the national public agencies for finding employment. It is also planned for the G20 countries to make social-welfare provisions accessible to all, independent of the type of paid work, in addition to fair rules being negotiated, between the employers’ and employees’ representatives respectively, for provision of support to flexible models on working-time and the place of work.

### 3. International organisations

An important contribution to implementing global digitalisation successfully is made by the cooperation with various international organisations.

- The Organisation for Economic Cooperation and Development (OECD) offers an important political and subject-specialist platform for exchange of information and experience, cross-border collaboration and use of the expertise thus acquired. The Federal Ministry for Economic Affairs and Energy represents Germany in the OECD, in the **“Committee on Digital Policy”** (among other areas). Areas of emphasis for the Committee are, among others, broadband infrastructure, mobile communication, cyber-security, and trust in digital business. Another OECD key process is the new version of the **OECD Jobs Strategy** – that organisation’s reference document for labour-market policy. The new Jobs Strategy is expected to be adopted by the OECD Member States in May 2018. Beyond this, Germany is actively committing its efforts in the OECD’s permanent consumer-policy committees, providing support to a development of consumer-policy concepts and recommendations for action by the OECD.
- The (International Labour Organisation) **ILO Centenary Initiative on the Future of Work** offers an important reference framework for the global discourse on the transition in the world of work, resulting from globalisation and digitalisation. With the White Book “Work 4.0”, we are actively integrating the insights gained from the dialogue process, as a German contribution to the global ILO debate.

- We are actively collaborating with the United Nations Conference on Trade and Development (**UNCTAD**). Among other aspects, Germany has been crucially involved in advocating the formation of a **working group on consumer legislation and policy** within UNCTAD, through the consumer-protection guidelines adopted by the UN General Assembly in 2015.
- It is as part of international **Internet Governance** that, with the Federal Ministry for Economic Affairs and Energy's active participation, ICANN – the Internet Corporation for Assigned Names and Numbers (ICANN) – was launched: supervision of the IANA functions, i. e. the technical-administrative functions, such as the management of IP addresses, has been passed over by the US Government into the autonomous responsibility of the stakeholders that sustain the ICANN.

# V.

## Prospects



### 1. Future challenges facing business, labour and consumers

In the future, the speed, diversity and innovative power of the digital transformation will continue to generate opportunities and challenges and to necessitate solutions to conflicts of goals. Issues such as the securing of access to digital products and the retention of the social market economy in a digital world demand close collaboration between all stakeholders – business, employment and consumers.

A future digital strategy has to be a living strategy, one that can flexibly and quickly respond to new phenomena and issues. It must determinedly and effectively tackle the challenge of new digital technologies such as artificial intelligence, robotics or blockchain.


Our guiding theme takes the strengths of Germany's economic and social model as its starting-point. It is characterised by social partnership, a robust small to medium-sized business sector, diversified quality production, strongly innovative industry, and a high level of export orientation. Consistent with this, we wish to promote competition and shape it in a spirit of fairness. For this, we will establish a level playing field in telecommunications markets and further accelerate competition processes. We need intensive monitoring of the market and the opportunity to intervene if competition rules are breached.

Our aim is to further expand our model of a dual enforcement of the law, so that consumers, and providers of goods and services whose conduct demonstrates fairness, benefit from the advantages offered by the mechanisms for enforcing civil law and public law. This includes continuing to provide financial backing at a high level for the Marktwächter Digitale Welt (Market Watch Digital World), run by the German Consumer Organisations, and also introducing a Musterfeststellungsklage (sample legal action for a declaratory judgement).

We want to create a modern data economy. For this purpose we will establish a clear legal framework for data use and also make Europe's high standards of data-protection into a competitive advantage. For us, innovation and growth in the digital economy integrally belong together with the comprehensive protection of individuals' personal data. The aim is to achieve greater transparency through independent, target-group-specific information, as well as through quality-seal and certification solutions. With an overall strategy on digital participation, we aim to strengthen older citizens' internet competence and consumer competence.

To improve IT security, we will work on an overall concept with IT security rules valid throughout Europe, and also check whether our contractual law and liability law is still equipped to match digitalisation's challenges.

If auto-learn algorithms produce forecasts of human behaviour or prepare decisions, on principle their work must be able to be checked by a monitoring body. The purpose of this is to ensure adherence to the ban on discrimination and on other unfair practices.



This necessitates a sufficient minimum of objective justifiability in decision-making, as viewed by a monitoring body. Use of this technology, rich in opportunity, must not be allowed to lead to individuals experiencing discrimination or to the “cementing” of inequality within society. This is why we will develop approaches to rulings, enabling the ramifications of particular given algorithms to undergo a check. The aim is a reliable legal regulatory framework that maintains a corridor for innovations yet imposes regulatory boundaries on the use of potentially discriminatory algorithms.

As regards the Internet of Things, Germany has a great opportunity, with its strong industry and its professional services associated with industry, to position itself at the front in the next phase of digitalisation. Our target is to become a role-model at linking up areas of industrial competence with digital opportunities. We want to see our small to medium-sized enterprises actively engaging with digitalisation, so as to be able both to assert their market positions, in the future as now, and also to conquer new markets. To do this we must very significantly strengthen the activities currently in progress. This is why we want to set up targeted incentives for SMEs to make investments in the digital transformation. We will also expand our technology programmes for research close to practical application, directed at fostering digital cutting-edge technologies such as artificial intelligence, robotics, autonomous systems, augmented reality (3D, virtualisation), blockchain and smart home. Alongside the financial support to start-ups, spanning various business sectors, we will continue the provision of focussed support to the young digital industry.

So that the digital transformation gains the maximum support, it is essential that we become a learning society. We need to further monitor new trends. There is a need to improve the foundation of data on how our world of work is developing. It remains to be seen what the impact will be on the quality of work, short-term and medium-term, resulting from the new interplay of interconnected machines, Big Data and “agile” forms of work. Here a joint learning process should be launched, for companies, the science community, employee representatives and politicians, in the form of laboratories and experimenting areas. Jointly with management and the workforce, topics for experimental areas should be coordinated, with these being implemented in business sectors and individual firms and also accompanied scientifically, in a way that is aimed at participation.

We need a new inter-ministry “Work 4.0” strategy for innovation, research and knowledge transfer. This is why the Federal Government’s existing



possibilities for provision of support to research and for transfer need to be woven together effectively and, where necessary, expanded.


Where new uncertainties emerge due to the digital transformation, targeted investments are needed in basic and further training, so as to make individuals' entry into work life, their transitions and their career changes easier, and also to strengthen their development prospects. Likewise, employment law and social-security law must also dynamically keep pace with the transition in the world of work. Therefore politics has the task of establishing new elements of security that lend themselves to being fitted into the social market economy, and that enable the members of society to have a sufficient level of collective social welfare. It is necessary to continue making enough financial resources available for the social-welfare systems to maintain a performance level that does justice to the tasks that they have.

The state, as well as employers and employees, must ensure that a rising level of prosperity yields its rewards for all sections of the population, giving as many people as possible the opportunity for personal advancement. This is about preventing a split between winners and losers of a digital age. Digitalisation can succeed only if consumers trust new business models. So an important supporting pillar of successful digitalisation is the safeguarding of consumer rights, transparency and security in the internet.

The best outcome for Germany will emerge if there is a closing of ranks in and with Europe, enabling digitalisation's opportunities to be taken jointly and its challenges mastered jointly. Europe's reply to digital global markets can only be to think big and to act big, as well as to present itself to the world as a unified force.

## 2. Effective and efficient Federal Government digital policy

We are committing ourselves to a Federal Government digital policy that is directed at strategic goals and is well coordinated. A future **Digital Strategy** by the Federal Government must establish political goals such as digital participation, cyber-security, or the building-up of people's digital competences, reinforcing this with specific measures. Shaping the digital transformation is a task with all-embracing relevance, affecting the whole Federal Government.



In order to shape and to implement a digital strategy efficiently and effectively, we want to take the following guidelines as our orientation:

- We want to establish structures of **coordination and decision-making** within the Federal Government, in order to keep pace with the digital transformation and to bring about **political decisions more quickly**.
- In forming a **Digital Agency**, we want to establish a think tank, thereby improving the provision of scientific advice to the Federal Government on digital-policy issues.
- We want to **integrate groups within society**, such as trade unions, employers' associations and consumer organisations, in addition to non-government organisations, in the task of preparing political decisions on digital policy, in order to place the shaping of digital policy onto the broadest foundation possible within society.
- We want to **strengthen federal authorities**, such as the Federal Office of Justice, the Bundeskartellamt (authority on cartels), the Bundesnetzagentur (agency on electricity and telecommunication), and the Federal Financial Supervisory Authority, in order to recognise new challenges posed by the digital transformation, quickly and effectively, and to forge solutions.

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