

OPPORTUNITIES AND RISKS OF MOBILE AND DIGITAL COMMUNICATION IN THE WORKPLACE



TAB-Fokus no. 14 regarding report no. 174

April 2017

Summary

- › Digitisation involves a comprehensive workplace transformation which is embedded in an overall economic and societal change (globalisation, demographic trends).
- › The currently widely unclear impacts on the labour market resulting from the digitisation of production and business processes as well as from new platform-based forms of work are of particular social importance.
- › The increased flexibility resulting from being able to work anywhere at any time offers employees more autonomy with regard to shaping their work. Partly, however, there is a risk that the boundaries between work and leisure time are blurred and work is intensified which could involve impacts on human health.
- › Currently, the knowledge and data basis for evaluating these ambiguities is very rudimentary and should be improved within the framework of a broadly based research policy.

What is involved

The rapid evolution of information and communication technologies (ICT) has already involved profound changes in the workplace. For approximately 25 years, the professional use of computers has increased continuously (fig. 2). Moreover, since the emergence of mobile terminals (smartphones, tablet computers and the like), the degree of networking and mobility with regard to working processes once again has risen significantly. For companies, this results in the incentive to digitally network their production processes (Industry 4.0) and to organisationally outsource work activities from the traditional business to the Internet (cloud computing, crowdworking). This development – which is taking place in various sectors and fields of activity at a different pace and in different forms – has a fundamental impact on employment in general and on how work is organised.

However, there are still major uncertainties with regard to tangible characteristics and effects of the digitisation of work. This mainly applies to the economic impacts: While

some refer to the enormous innovation potential and to the opportunities in terms of maintaining prosperity and competitiveness, others see risks for the labour market resulting primarily from a potential for technological rationalisation and new precarious types of employment such as crowdworking. As the technological change processes are intertwined with complex economic and social processes, future impacts of the digital change on employment cannot be forecast reliably. This is also reflected in contradictory studies regarding the topic.

Compared to the economic consequences, the impacts of digitisation for employees have been neglected for a long time. In this regard, increasing flexibility in the workplace is an essential side effect: Thanks to the Internet, work is ever less linked to specific times or places. Studies confirm the ambiguity of this development: On the one hand, this creates a great deal of freedom for employees offering better opportunities to reconcile work and family life. On the other hand, it also contributes to increasingly blurring the boundaries between professional and private life which is even aggravated due to rising time pressure and pressure to perform and might result in stress and overload. The implications of this area of conflict in individual cases depend, among other things, on the individual's level of education, his/her mental and physical condition as well as on the workplace environment.

Comparison of two industries

The TAB report outlines and classifies the complex, but often still vague developments of a Workplace 4.0 for two very different industries. For this purpose, two economically strong industries have been analysed: the automotive industry for the field of production work and the

Client

Committee on Education, Research and
Technology Assessment
+49 30 227-32861
bildungundforschung@bundestag.de

sector of ICT services for the field of service work. Altogether, the results show that a considerable technological and organisational change is already taking place in both industries. However, it is interesting to note that the generally forecast profound changes due to Work 4.0 – such as e. g. the technical replacement of human work or the loss of stable forms of employment – have so far not been reflected in today’s workplace. Currently, both industries are experiencing a continuous increase of employment and both are still mainly characterised by traditional full-time forms of employment. So far, crowdworking does not play a decisive role in both industries. Another similarity can be observed with regard to the digital divide between large and small enterprises. Applications of ICT and Industry 4.0 are used significantly more often by large companies than by small and medium-sized enterprises (SMEs). However, there are differences with regard to digitally supported trends towards an increased flexibility and blurred boundaries: These effects are already visible today in the sector of ICT services (fig. 1), whereas in the automotive industry – which is still characterised by shift work and fixed working structures – they are less pronounced. Though, employees in both industries experience a continuous intensification of work and increasing working pressure to a similar extent. Altogether, a comparison of the two industries shows that the development trends are likely to experience an ever greater approximation in the future due to digitisation:

- › At the technical level, this will happen due to cloud computing, automation as well as digital and networked production.
- › Moreover, there will be another cross-industry approximation with regard to potential new business models and products (e. g. regarding autonomous driving).
- › In the field of working structures, there will be an approximation due to the increasing number of digitally supported forms of work (project work, standardised work packages).
- › Another approximation is taking place at the level of qualifications and necessary skills (process understanding, ability to analyse data).

Vision of Industry 4.0

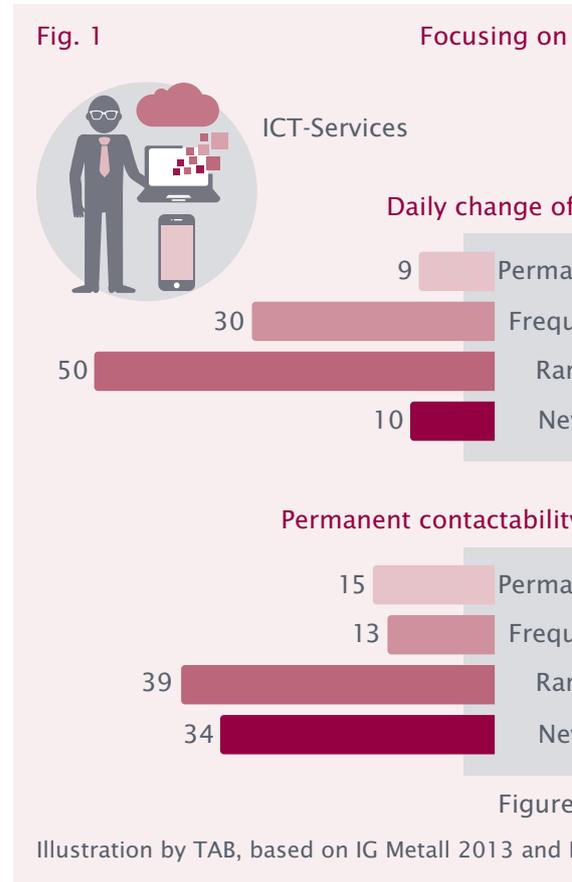
The term Industry 4.0 includes many different technologies of the future (robotics, 3D printing, Internet of Things) which have the potential to fundamentally revolutionise industrial production. The core aspect of this approach is the digital networking of humans, machines and industrial processes within the framework of the so-called »Smart Factory« which shall enable technology-based efficiency gains and will involve profound changes with regard to work. Bitkom and Fraunhofer IAO estimate the national economic potential of Industry 4.0 to almost EUR 80 billion until 2025.

How can employment be secured? Continuing vocational training is what we need!

Both in industry and in service sectors, possible employment effects of digitisation have to be expected which, however, currently cannot be quantified accurately. Nevertheless, it is clear that the digital workplace transformation with regard to imminent risks for employment represents a challenge mainly for education policy. This is due to the fact that in the future professional opportunities will increasingly depend on digital literacy. As a consequence, tailored and preferably lifelong learning and training will become more and more important.

In view of its excellent vocational qualification system, Germany undoubtedly offers outstanding opportunities in this respect. However, there still is no common legal entitlement to continuing vocational education and training.

Moreover, though they generally are highly interested in continuing vocational training, many employees particu-



Crowdworking

Crowdworking is a form of outsourcing by means of which companies outsource different jobs to correspondingly qualified and self-employed Internet users against remuneration. In recent years, the phenomenon of crowdworking has been constantly growing. For 2016, the World Bank forecasts a global gross turnover of USD 4.8 billion for all services provided by means of crowdworking which probably will increase to approximately USD 25 billion in 2020 already. In Germany, however, crowdworking still is a marginal phenomenon: Until 2014, only 3 % of German companies have made use of crowdworking.

larly of SMEs currently have only few opportunities to take advantage of formal continuing vocational training options. Nevertheless, there is no lack of public funding. An essential problem is that the existing funding options are not taken into consideration yet to the desired extent particularly by SMEs and their employees which, last but not least, is also due to a lack of awareness and to the confusing variety

regarding these options. Strengthening continuing vocational training particularly in view of the needs of SMEs and their employees should therefore mainly focus on the efficiency of existing programs.

In addition to formal continuing vocational training, however, more appreciation should be given to informal learning outside recognized educational institutions. This type of learning,

called »training on the job«, is becoming more and more important, as formal training offers can hardly keep up with the rapid pace of the changes mentioned. It should be considered how informally acquired skills can be recognized in order to ensure that they are generally accepted on the »certificate-oriented« German education market.

Focusing on the design of technology itself: Strengthening data privacy and co-determination

The digital transformation in the workplace can only be socially sustainable if working conditions are created that are primarily oriented towards human needs instead of technical specifications. In this respect, data privacy is a primordial issue, as it concerns fundamental personal rights of the employees which seem to be increasingly threatened by a comprehensive digitisation of work.

On the one hand, manufacturers have to be addressed here. The manufacturers' awareness of the development of flexibly adaptable IT solutions that implement data privacy and security aspects already in the technical design should be increased (»privacy by design«). The new EU General Data Protection Regulation (GDPR) gives more weight to corresponding measures, but fails to involve manufacturers directly. From the government side, it would be worth considering to specify as a technical standard that all recording options as basic settings for technical devices initially are switched off by default and have to be enabled first (»privacy by default«). In general, employees should know which personal data are recorded.

On the other hand, the aim is also to strengthen and further develop co-determination in the workplace. For it is clear that the employees and their representatives must support the IT-related reorganisation of entire business units. Although works councils have comprehensive information and co-determination rights, they are facing fundamental challenges. Outsourcing activities to the global crowd is only one example that shows how Work 4.0 can gradually undermine efficient co-determination in the workplace. Against this background, it should be clarified how participation in the workplace can be reasonably strengthened when new technologies are introduced and applied – particularly with regard to human-oriented working conditions – and how it can be further developed in view of increasingly digitally networked company structures with fewer and fewer spatial boundaries. The requirements of such a kind of Co-determination 4.0 are still unclear and should be negotiated between the social partners.

Increased flexibility and blurred boundaries

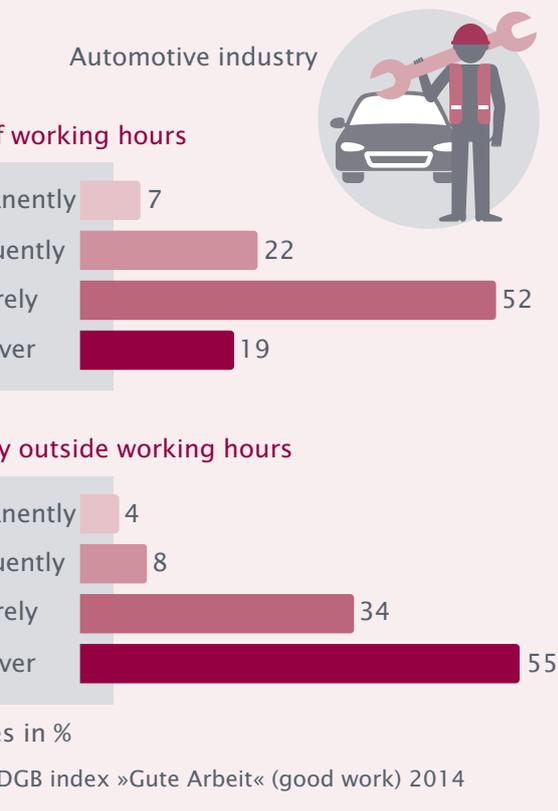
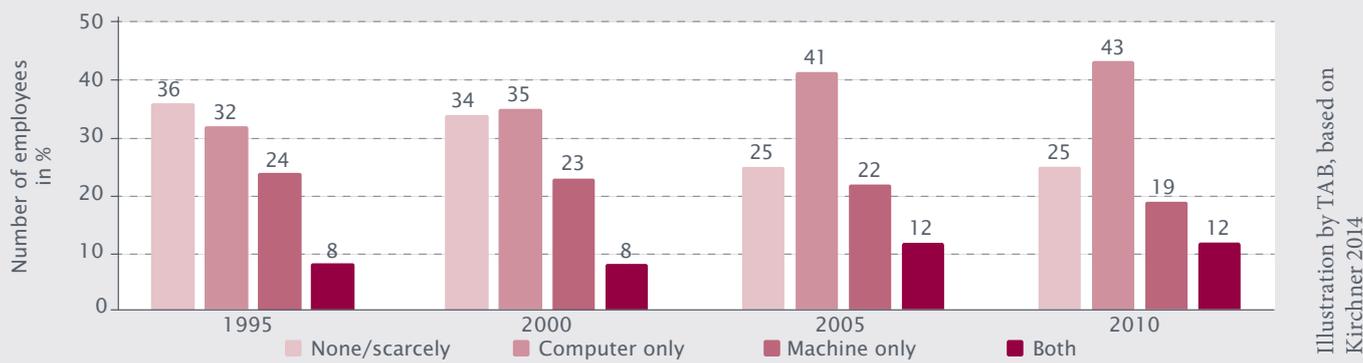


Fig. 2 Digital trend: Use of computers and machines in Germany since 1995



Individual consequences: Focusing on the organisation of working time

Due to significant side effects of digitisation, it is necessary that employees shape their work processes more and more autonomously. This raises the question of how to adequately design legal and company framework conditions in order to protect individuals against stress and work overload. Besides occupational health and safety, the main issue in this context is the organisation of working time.

The following is obvious: Aspects like increasing contactability and gradually blurred boundaries between work and leisure time can hardly be kept down reasonably by general prohibitions, particularly because many employees consider these developments to be an opportunity to make their working hours more flexible. In this respect, the aim is to adapt labour law to the digital era in such a way that the available freedoms will remain and the use of these freedoms at unusual times will nevertheless be limited to exceptional cases. In view of the heterogeneity of working structures and personal life situations, flexible forms of regulation seem to be most appropriate, for example in the form of tailored working time arrangements at the company level as they are currently tested in several companies. Here as well, co-determination in the workplace plays a decisive role.

However, this has to be accompanied by considerations on how to further develop the legal framework so that at least gross misdevelopments can be prevented. In this context, e. g. a right to non-contactability or a legal obligation to log all digital working times (which are charged to the corresponding working time account) have to be considered.

Need for information and research

Though, without any doubt, digitisation in the workplace represents one of the major changes of the past 20 years, only little is currently known about the actual technology impacts and interdependencies involved.

In order to provide a better data and decision-making basis, a targeted specification and extension of existing statistical surveys on the use and distribution of digital work tools

TAB report no. 174

Opportunities and risks of mobile and digital communication in the workplace

Franziska Börner, Christoph Kehl, Linda Nierling



Website of the project

www.tab-beim-bundestag.de/en/research/u20000.html

Project manager and contact

Dr. Franziska Börner

+49 30 28491-105

boerner@tab-beim-bundestag.de

would be required (e. g. of the German Federal Statistical Office and the statistical offices of the German Länder as well as within the framework of surveys of employees conducted by the Federal Institute for Vocational Education and Training (BIBB) and the Federal Institute for Occupational Safety and Health (BAuA)).

Moreover, based on this, there is an increasing need for qualitative research and – in view of the dynamic changes – for research with a high temporal resolution which provide in-depth findings on the industries and work areas involved as well as on their respective changes. One of the goals should be to develop practice-oriented design possibilities for achieving a »good« digital change. Major topics include implications of new platform-based forms of work, an adequate design of production systems and human-machine interfaces or new qualification requirements.

The Office of Technology Assessment at the German Bundestag (TAB) is an independent scientific institution which advises the German Bundestag and its committees on questions of scientific and technological change. TAB has been operated by the Institute for Technology Assessment and Systems Analysis (ITAS) of the Karlsruhe Institute of Technology (KIT) since 1990. It has been cooperating with the Helmholtz Centre for Environmental Research – UFZ, the IZT – Institute for Futures Studies and Technology Assessment and VDI/VDE Innovation + Technik GmbH since September 2013. The Committee for Education, Research and Technology Assessment decides on TAB's work programme, which also includes subjects proposed by other parliamentary committees. The standing »TA Rapporteur Group« consists of one member from each of the parliamentary parties: Dr. Philipp Lengsfeld (CDU/CSU), René Röspel (SPD), Ralph Lenkert (Die Linke), and Harald Ebner (Bündnis 90/Die Grünen) and the Chairwoman of the Committee, Patricia Lips (CDU/CSU).