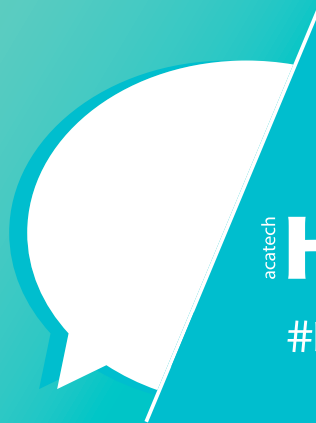# Annual Report

The New World of Work: Propositions for Shaping Digital Transformation

acatech HR-KREIS

#FutureWorkDebatte

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NATIONAL ACADEMY OF
SCIENCE AND ENGINEERING

acatech's Human Resources Working Group (HR Working Group) is dedicated to the question of how digital transformation can be shaped. Against this background, this report summarises some of the key findings of our work and is intended to contribute to an open discussion among policy makers and in society on the future of work, irrespective of party, employer and union policy considerations.

Executive Summary

The way is being paved today for tomorrow's world of work. In its „Fit for Future Work" series of debates, the Human Resources Working Group (HR Working Group) coordinated by acatech discusses issues relating to the future of work that are currently facing management boards of leading technology and service companies. The objective of this series of top-level discussions is to develop specific solutions for good working conditions in the digital transformation in close cooperation with other stakeholders from the ecosystem that comprises policy making and administration, social partnership, business, academia and society.

An overarching theme of all the DEBATES is the new way of working that has recently been gaining traction in companies as a result of digitalisation and employees' changing demands, as well as the form this "New Work" will take, especially with regard to work processes, equipment, working methods and organisational parameters. Three key findings have emerged from the DEBATES. Firstly, it will not be possible to implement the new world of work using standardised processes; instead, it will require flexible frameworks that provide individual configuration options. Secondly, the new way of working needs to be human-centred. Thirdly, it must reach as many employee groups as possible in the various fields of activity – from knowledge work and factory production to logistics, retail, health, education and social services – so that it can also contribute to social progress.

In the digital world, New Work comprises a number of different aspects, some of which are recent developments, whilst others are existing topics and trends revisited[1]:

1. **Flexibility in time and location of work:** Ever since the Covid pandemic, work in many fields has no longer been tied to fixed hours or a specific location. The increasing use of digital tools in Industry 4.0 has also resulted in new opportunities for workers in production-related fields (and no longer just office workers and and knowledge workers) to play a more active role in determining how they organise their work.

2. **Greater scope in the design of work:** Artificial intelligence is being used to rethink work processes, especially with regard to knowledge work, while rigid processes are increasingly being dismantled. It is becoming more and more important that employees to are given the freedom to decide how they make intelligent use of the new tools.

3. **Empowerment through technology:** Digital tools must be designed so that they are human-centred, easily accessible and can be deployed immediately. The combination of humans and technology has the potential to improve working conditions while at the same time increasing productivity.

4. **Agility results in progress:** Small-scale, rapid, local solutions will generate the greatest added value in day-to-day operations. These enable continuous improvement and progress in the short term, generating enthusiasm among employees for long-term change processes.

5. **Development of skills and employee potential:** Thanks to numerous e-learning offerings, knowledge is accessible to all at reasonable cost and available to users at virtually any time. For both employees and companies, there are many opportunities to make effective use of the digitalisation and democratisation of knowledge.

6. **Greater individuality and time sovereignty:** „Unbureaucratic" reconfiguration of employment contracts will allow employees and employers jointly to establish guidelines that will ensure successful cooperation in various life situations. A vital complement to these guidelines will be legal regulations that ensure contractual provisions are made on an individual basis and take account of different phases of life.

7. **A sense of purpose and a change in attitudes to work:** The labour market is no longer an employers' market but an employees' market. This was demonstrated not least by the huge wave of resignations during the Covid pandemic (known as the Big Quit and the Great Resignation), underlining the fact that companies are facing a turning point when it comes to their human resources policies. Employers need to offer their (potential) employees meaningful occupation and give them the freedom to make decisions about when and where they work. This is the only way they can succeed in the battle for talent.

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1 | See Jürgens et al. 2017.

Human resources management plays a key role in implementing these trends in practice and adapting them to the company's operational requirements, equipping the organisation with the skills it will require in future, enabling it to continue to acquire skilled employees and guiding cultural change and organisational development. One of the main functions of the Chief Human Resources Officer (CHRO) is to pave the way for the transformation of work, which can only succeed if it is designed for humans by humans.

To provide guidance for this change, the HR Working Group has devised twelve propositions for shaping digital transformation in the world of work. These can be divided into **four thematic clusters** which are described below.

Technology as a driver of change

Technological progress is both a driver and an enabler of the new world of work. Big data, algorithms and artificial intelligence offer great opportunities to rethink and reorganise work. Digitalisation has certainly arrived in day-to-day business. However, companies need to enhance their capacity to rapidly adapt new technologies and embed them in the organisation in order to maintain their position in the global innovation competition and attract the qualified people required to do so.

Future-proofing: New Work and a willingness to embrace change

The capacity and willingness to reshape work are crucial to the future of Germany as a location for innovation. HR and especially CHROs, must pave the way here for the transformation within companies. To do so requires not least a realignment of the organisational framework that has applied until now. Co-determination and regulatory standards must continue to be developed, so that they provide companies with the necessary flex-

ibility and legal certainty and support their capacity for change. The digital transformation – and the associated reorganisation of the world of work – can contribute significantly towards increasing work productivity and companies positioning themselves as employers that can attract talent, thus countering the skills shortage.

Generating engagement

The transformation depends crucially on the engagement and commitment of employees and can only succeed if workers are actively involved in change processes. It is therefore vital that employees understand the individual and collective benefits of new forms of work and of digital tools or processes. Moreover, all the stakeholders must learn to understand digital technologies and acquire new skills. Companies must adopt new ways of thinking and focus on targeted development of skills in the workforce and in the organisation. They need to create a culture which puts people at its centre and encourages enthusiasm among employees for an agile approach and for lifelong learning.

New solution spaces for organisation and participation

Digitalisation provides opportunities for innovation and good working conditions. At the same time, reshaping the world of work for tomorrow raises a number of (technical, organisational, legal and social) questions. The transformation requires new approaches and stategies; there is no "one size fits all" solution. Organisations need dedicated solution spaces in which they can try out new approaches and adapt them to their own requirements. This means that employee involvement is essential to the process, since the work of the future requires working together in partnership, human-centred processes and a culture that promotes participation, the development of potential and a willingness to embrace change.

Twelve propositions for shaping digital transformation

The 2023 Annual report summarises the key findings of the "Fit for Future Work" series of debates coordinated by acatech's HR Working Group and presents them in the form of twelve propositions for reshaping work. This report sets out six new propositions derived from the DEBATES that took place in the course of 2023. It also revisits the six propositions set out in the 2022 Interim report, amending and/or expanding the points as required to take account of new findings and fresh perspectives arising from the series of debates.[2]

The twelve propositions focus on four key topics: (i) technology as a driver of change, (ii) devising a framework for the new world of work to ensure future-proofing of Germany as a business location, (iii) generating engagement, which is crucial to the success of digital transformation and (iv) the need to create new solution spaces for organisation and participation. Figure 1 gives an overview of the four thematic clusters and the twelve propositions within them.

The aim of the report is to provide specific future-oriented approaches that will shape the transformation and to contribute to an open discussion among policy makers and in society on the future of work, irrespective of party, employer and union policy considerations.

Technology as a driver of change	Future-proofing: New Work and a willingness to embrace change
Proposition 1 | Digital transformation is a crucial building block for renewing competitiveness, resilience and cross-company collaboration (2022).	**Proposition 4 | Chief Human Resources Officers (CHROs) are becoming the drivers of change capability in a corporate setting (2022).**
Proposition 2 | Digital transformation is day-to-day business (2023).	**Proposition 5 | In the new world of work, co-determination and regulation should be considered an international competitive advantage and be further developed (2023).**
Proposition 3 | Data, algorithms and AI are powerful tools for companies. These technologies present opportunities that need to be exploited very rapidly (2023).	**Proposition 6 | Greater individualisation and enhanced flexibility in the organisation of work is one way to counter the shortage of qualified personnel (2023).**
Generating engagement	New solution spaces for organisation and participation
Proposition 7 | Employees' willingness to embrace transformation depends on perceived benefits to the individual (2023).	**Proposition 10 | The tensions inherent in digital transformation must be resolved (2022).**
Proposition 8 | The success of the transformation largely depends on improving the technological understanding of all employees in the company (2023).	**Proposition 11 | There is a need for new solution spaces if digital transformation is to succeed (2022).**
Proposition 9 | Lifelong learning is one of the keys for shaping change (2022).	**Proposition 12 | "Digital culture" is becoming the central capability for ensuring the success of digital transformation (2022).**

Figure 1: Overview of the thematic clusters and propositions within each cluster. The dates attached to each proposition are to facilitate an understanding of evolution since the 2022 Interim report.

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2 | See acatech 2022.

Cluster 1: Technology as a driver of change

> Technology is advancing at a rapid pace and changing the ways in which we will work, consume and conduct business in future. Companies have long recognised that they need to seize the opportunities arising from digital technologies and now the time has come for them to put the lessons learned into practice.

nologies and forms of work are better-placed to react to technological, environmental and social developments or crises and to make adjustments to their organisation when circumstances change, meaning that they remain able to function. A key task for the future is systematically increasing the change capability and resilience of organisations and their employees: by creating robust digital infrastructures, introducing agile forms of work and organisation, providing the workforce with targeted skills development and advanced training, implementing intelligent self-learning processes, and enabling collaboration within the company and beyond.

Proposition 1: Digital transformation is a crucial building block for renewing competitiveness, resilience and cross-company cooperation (2022).

In the past few years, companies have been faced with a number of different (sometimes overlapping) challenges: digital transformation, recruitment of workers and securing skilled personnel (bearing in mind the Great Resignation), increasing global competition and the energy crisis, as well as supply bottlenecks for inputs and intermediate products. At the same time, the scale, pace and simultaneity of change processes has been putting companies under pressure to act in order to maintain their competitiveness.

It is evident from acatech's HR Working Group's Interim report that digitalisation is a key factor in managing ongoing structural change and ensuring the ability of German companies to innovate. It is not an option but a necessity. Companies need to be (more) resolute in the way they exploit and implement the opportunities offered by digital technologies. Cloud computing, big data and artificial intelligence offer great potential for value creation and growth and new forms of cross-company cooperation; digitalisation and automation make it possible to reshape work processes ("New Work") and provide the opportunity to increase the quality and attractiveness of work and to make the organisation ready to embrace change.[3]

Recent DEBATES in the HR Working Group highlight the importance of digitalisation in increasing resilience in the transformation. Companies that invest specifically in adapting digital tech-

Proposition 2: Digital transformation is day-to-day business (2023).

Digital transformation has now become part of the day-to-day business of German companies. The introduction of new technologies and the resultant adaption of organisational structures and of working practices and processes is, unlike the situation a few years ago, no longer being driven by special programmes, but accomplished in the course of ongoing operations.

Nevertheless, it is clear that transformation by no means happens by itself. Given growing global competition, companies are under huge pressure to be efficient and are faced with a multitude of different demands. To master the balancing act between preserving their existing core business and developing their capacity for change, they need to deploy their resources in a targeted way and focus on business-critical trends. The challenge lies in finding out which technologies are really important and incorporating these into the work process swiftly and systematically.

The DEBATES in the HR Working Group illustrate two things. Firstly, Board-level management must play an active role in shaping transformation. Setting clear responsibilities, prioritising activities, providing resources and defining success criteria are key levers for managing, accelerating and consolidating digital transformation. Secondly, new approaches are needed to drive forward the transformation of work at the pace required. Large-scale company-wide programmes have often not had the desired effect in the past.[4]

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3 | See acatech 2022.
4 | See Kleske et al. 2020.

Agile procedural approaches offer a promising alternative, as they focus on the development of rapid local solutions. Tangible results can be achieved within a short timespan that provide appreciable added value in day-to-day business – for customers, employees and managers. Rapid continuous progress contributes significantly towards ensuring that change processes are results-based, benefits are shared, and engagement is generated among employees for long-term change processes.

Proposition 3: Data, algorithms and AI are powerful tools for companies. These technologies present opportunities that need to be exploited very rapidly (2023).

With the transition to a data economy, data, algorithms and artificial intelligence (AI) are elementary tools for companies. Adapting these key technologies offers huge potential to shape work to make it more efficient, more productive and of higher quality – and therefore plays a vital role in ensuring that companies can compete at international level and counter the skills shortage.

This is particularly evident when looking at the progress made in generative artificial intelligence (GenAI). Applications such as ChatGPT, Bard and Stable Diffusion are increasingly being used in business practice. It is to be assumed that generative AI will accelerate the transformation of work and will have a particular impact on creative and highly-skilled occupations. An example of this is the support provided by digital assistants to software developers when writing program code. In human resources management, the use of AI applications is also becoming increasingly relevant. Automation could be applied to operational activities such as writing job advertisements, answering questions relating to onboarding, and devising training and development programmes. The use of generative AI would thus relieve professional staff of time-consuming routine activities, giving them the freedom for creative work or innovation and increasing self-efficacy and wellbeing at work.

At the same time, there are fundamental questions that need to be addressed at the operational level in order to realise the potential of generative AI. The DEBATES in the HR Working Group make it clear that the main concern is redefining the role of humans in the work process and developing the interplay between humans and AI systems ("hybrid intelligence") accordingly. Decision-makers within the organisation need to acquire an understanding of how to make appropriate use of AI applications, so that human capabilities are enhanced and human knowledge gained through experience can be used for algorithmic learning processes.[5]

Human resources management has a particularly important role to play here. HR not only needs to understand the technical aspects of the introduction of AI, but also to consider the social, ethical and organisational implications and pave the way for both managers and employees to acquire the necessary skills to ensure productive use of AI at work. Two aspects are crucial here. The first of these is critical thinking and an awareness of the strengths, weaknesses and limitations of the technology. The second is the absolute necessity for data competence, creativity and analytical thinking in order to be able to adequately describe problems and ensure that AI applications deliver helpful results.

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5 | See Daugherty/Wilson 2018.

Cluster 2: Future-proofing: New Work and a willingness to embrace change

In the course of the structural transition, the capacity and willingness of companies to embrace change will become a crucial factor and the function of the Chief Human Resources Officer (CHRO) will become the key driver of the transformation of work. In order to future-proof Germany as a business location, new ways of working must be established with the help of digitalisation and working arrangements must be made more flexible, so that, given the skills shortage, "dormant potential" can be unleashed in the labour market. Co-determination and the regulatory framework must also be developed in a way that is innovation-focused.

Proposition 4: Chief Human Resources Officers (CHROs) are becoming the drivers of change capability in a corporate setting (2022).

The massive changes arising from digital transformation have an impact on all organisational areas as well as on all employees. CHROs in particular have a key role to play here. On the one hand, they represent the employees at senior management level, while on the other hand they are paving the way for the transformation by using strategic personnel planning and development to empower employees to operate in the new world of work. They thus have a major involvement in shaping cultural change and redesigning the organisation of work and organisational structures, becoming the driving force by enabling and advancing the change process throughout the company.[6]

So that new technologies can be rapidly adapted and profitably deployed, the relevant skills (such as adaptability, reflexivity and technological skills) must be built up within the organisation. At the same time, it requires new skills in the workforce. Not only digital skills have been growing in importance but also, in particular, cognitive, social and methodological competences (such as creativity, time management and self-organisation) as well as systems thinking.

Crucial factors for business success will be the establishment of the organisation's skills portfolio and the adoption of sustainable competence development strategies that offer attractive future prospects, enhance workers' employability and meet the demand from companies for (skilled) labour. Meanwhile, HR departments themselves are facing a radical upheaval as a result of digital transformation, as HR will also need to make full use of the potential of new technologies.

Chief Human Resources Officers are becoming key figures in shaping the transformation process within companies. Their role will be to work closely with other Board members to shape strategic developments to ensure the viability of the company in the future.

Proposition 5: In the new world of work, co-determination and regulation should be considered an international competitive advantage and be further developed (2023).

Germany as a business location is characterised by a strong culture of co-determination at company and cross-company level and, particularly in comparison with other countries, high regulatory standards. In the past, this basic constitution has resulted in a high degree of stability, growth and social prosperity. At the same time, digital transformation in particular is making it clear that existing institutions and regulatory mechanisms are reaching their limits. A key task now lies in tailoring co-determination and regulation to the requirements of the new world of work and continuing to develop these established strengths as a competitive advantage for Germany as a business location in the international context.

The DEBATES conducted by the HR Working Group highlight the fact that co-determination is a key success factor for the transformation of work. Effective co-determination in the workplace ensures that employees are involved in decision processes from the outset. Works councils organise the participation of the workforce and make a significant contribution towards generating enthusiasm among employees for adapting new technologies and working methods. The early involvement of workers is a vital tool for managing tensions, avoiding friction and exploiting the opportunities arising from digitalisation for work innovation.

6 | See acatech 2022.

At the same time, it has emerged from the DEBATES that co-determination requires an update, so that it can help shape the working world of tomorrow in a way that supports innovation. On the one hand, new procedures for the regulation of interests at company level need to be developed. Procedural approaches procedure models (for example, in the form of "living collective bargaining agreements") are proving to be an agile alternative to static a priori regulation. Moreover, in view of ever more diversified requirements, there is a need for flexible frameworks that offer the opportunity of individual reconfiguration (with regard, inter alia, to shaping working conditions). On the other hand, it is necessary to harness the opportunities arising from digitalisation to involve employees more directly in operational decision-making processes and to speed up arrival at a consensus. The Works Council Modernisation Act (BReModG) includes provisions that lay initial foundations for the digitalisation of co-determination.

Reshaping co-determination and regulation is key to future-proofing Germany's status as a business location. In view of the wide variety of change processes and variations in business demands, the legal framework should be tailored in such a way as to give enterprises greater scope to be experimental and innovative working together with business partners, while at the same time ensuring that the legal protective function for businesses remains in place. The need for re-regulation therefore forms part of this proposition.

Proposition 6: Greater individualisation and enhanced flexibility in the organisation of work is one way to counter the shortage of qualified personnel (2023).

The shortage of skilled personnel is currently one of the most urgent challenges faced by Germany in its capacity as a centre of innovation. It is proving increasingly difficult for companies to find and retain well-qualified workers.[7] In view of demographic trends, it is expected that existing shortages will be further exacerbated in future by the medium-term decline in the labour force.[8] It is therefore essential to devise new solutions to secure skilled employees – to manage the transformation, retain Germany's innovative strength and future-proof its status as a business location.

Against this backdrop, the German Federal Government has redesigned its skilled labour strategy and drafted various measures to promote the professional development of skilled workers in Germany (including education and training, participation in the labour market, work culture, and skilled worker migration).[9] The DEBATES in the HR Working Group provide additional impetus to overcome the skilled labour shortage. On the one hand, it is clear that technological solutions are required to combat existing skills shortages. The digitalisation of business processes and the automation of work processes will be key tools in relieving existing skilled personnel of manual or repetitive tasks, thereby increasing work productivity.[10]

On the other hand, more flexible and individualised working arrangements are making a major contribution towards attracting more people into work and retaining existing workers long-term. It is important to create working conditions that can be tailored to suit people's needs and flexibly reconfigured over the various life phases they traverse. The reshaping of work is a key lever in recruiting hidden talent and activating the labour force potential of part-time workers, people who are no longer economically active or hardly active at all, and people with caring responsibilities, giving everyone the opportunity to participate in the labour market.[11]

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7 | See Hickmann/Koneberg 2022.
8 | See BMAS 2023.
9 | See BMAS 2022.
10 | See Achleitner et al. 2023.
11 | See Jürgens et al. 2017.

Cluster 3: Generating engagement

> The transformation depends entirely on the capabilities and engagament of the workforce. Companies are faced with the challenge of developing the skills required for the future and attracting workers who will help reshape the working world of tomorrow. At the same time, they are increasingly confronted with the expectation that they will fulfil their corporate social responsibility and develop impactful forward-looking initiatives that go beyond their own business interests.

Proposition 7: Employees' willingness to embrace transformation depends on perceived benefits to the individual (2023).

The transformation of work will only succeed if workers are prepared to engage with new technologies, processes and working methods and help to shape them. It is therefore crucial that the workforce is involved in change processes from the outset, creating win-win situations.[12]

Employees' willingness to embrace transformation depends to a large extent on perceived benefits to the individual. People are more prepared to adopt new ways and embrace change if they understand the benefits accruing to them personally or to their environment. This should increase the likelihood of them participating in transformation and making the effort required. This individual benefit may take various forms, including enhancement of their own skills and competences through training programmes, improved career and development opportunities and increased economic stability, as well as more scope to be creative at work. The latter can be achieved, for example, by the automation of routine tasks or the introduction of hybrid work forms which improve work-life balance.

Company managers play a key role here. When launching and implementing change projects, they need to emphasise personal benefit and to convey the advantages the reshaping of work will bring the individual employee or society as a whole, rather than merely to the organisation. A clear understanding of how digital technologies and agile forms of work will support individual and/or collective targets and needs helps to explain the relevance of change and to create incentives for employees to contribute to the transformation.

Proposition 8: The success of the transformation largely depends on improving the technological understanding of all employees in the company (2023).

The workplace of the future will substantially be shaped by new technologies. So that companies as well as the workforce can benefit from the new way of working, all employees must be able to use the new technologies adeptly and drive forward innovation. A key task of the transformation is therefore to increase the Technology Quotient (TQ) within the organisation.

The Technology Quotient provides information about the skills of individuals when handling current or emerging technologies: i.e. the capacity of those individuals to understand and adapt new technologies and to use them to achieve business success for the company. The higher the TQ of the workforce, the easier it will be for organisations to use technological progress as a driver of innovation, adjust to changing demands and achieve a competitive advantage.

The DEBATES in the HR Working Group make it clear that companies need to invest in to increase the TQ of their entire workforce rather than just acquiring tech talent in selected departments within the company. Instead, it is essential that workers in all areas of the organisation are able to adapt technological innovations and take an intelligent and independent approach to using them as work tools.

In the view of the experts involved, this is a worthwhile endeavour. Whereas employees' intellectual capacity (IQ) and emotional intelligence (EQ) remain comparatively constant over their lifetime – which is partly a reflection of the relative stability of IQ and EQ measurements – technological competence can to a great extent be influenced and developed.

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12 | See Jürgens et al. 2017.

HR management is required to support the workforce in this process. Upskilling is a key tool for providing employees with basic digital skills such as data literacy (the ability to read, evaluate and interpret data, as well as using data when making evidence-based decisions). In particular, easily accessible training programmes such as e-learning or the the provision of incentives can contribute towards businesses making rapid progress in increasing TQ and generating enthusiasm for transformation among employees.

Proposition 9: Lifelong learning is one of the keys for shaping change (2022).

Technological development, ecological structural change and demographic trends are altering the foundations of business and work. Existing work activities are changing as a result of the transformation and are being replaced by new ones. Accordingly, skills and competences need to be adapted and enhanced. In this context, lifelong learning can make a significant contribution towards improving the future career prospects of each individual, fully exploiting the potential of the labour force and ensuring the competitiveness of Germany as a business location.[13]

Based on market trends, technological developments and societal change, human resources management is facing the challenge of identifying future skills requirements and analysing the impact on the skills profiles of the workforce. At the same time, and running alongside current change processes, specific skills development concepts and programmes need to be developed for em-

ployees. Continuous reskilling and upskilling will ensure that employment prospects are preserved.

The DEBATES in the HR Working Group show that three factors increase the sustainability of enterprise-based skills development programmes: (1) Involving the workforce and social partners in the design of the training programmes helps convince employees of the merits of those programmes. (2) Learning must have a positive connotation and be associated with self-motivation and not compulsion. (3) Enterprise-based skills development programmes must be needs-oriented, rather than following a scatter-gun approach.

At the same time, digitalisation offers many opportunities to make acquiring skills more flexible, accessible and needs-oriented. Extensive knowledge is available either free or at low cost in the form of tutorials, blogs, massive open online courses (MOOCs) and podcasts, and all of these can be accessed anywhere and at any time. Systematic use should be made of the opportunities provided by digitally-based, independent self-directed learning and then integrated into work ("learning on the job").

On the one hand, lifelong learning requires greater commitment from individuals and builds on self-motivation. On the other hand, it requires an appropriate framework to generate engagement and a willingness to embrace change among employees. Lifelong learning will thus become a mission for society as a whole: business, the labour force, social partners and policy makers. The legal framework will need to be modified so that skills acquisition across a wide range is raised to a higher level: e.g. by increasing support for continuing professional development.[14]

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13 | See acatech 2022.
14 | See Jürgens et al. 2017.

Cluster 4: New solution spaces for organisation and participation

> The workplace of the future cannot be shaped using old formulas and approaches. It needs fresh ideas, the courage to embrace change, flexible governance structures and new solution spaces. Involving employees in reshaping working practices and conditions and in developing a digital culture will be key to the success of the transformation and to attracting and retaining talent.

Proposition 10: The tensions inherent in digital transformation must be resolved (2022).

Particularly at company level, digital transformation is accompanied by major changes, meaning that companies and their employees are faced with contradictory yet interdependent demands. First of all, it is vital to continue operating the core business successfully, while at the same time breaking new ground by adapting innovative (and even disruptive) technologies at an early stage. Secondly, companies are facing the challenge of making their organisation agile, developing the skills required for continuous renewal and strengthening employees' commitment to the company. Finally, the pressure is increasing, in the course of shaping the digital transformation, to pursue with equal vigour not only economic targets but also social and environmental ones, underpinned by appropriate measures.

Transformation can only succeed if a proactive approach is taken to the inherent tensions and contradictions therein. Speed and effectiveness are critical here for gaining a competitive advantage. Managers and employees need to develop the skills required for this, including the development of a "paradox mindset", a way of thinking that enables someone to handle contradictions and exploit them productively. In particular, HR plays an important role in this process, adopting targeted measures to support employees and providing the necessary resources.[15]

In addition, the DEBATES of the HR Working Group make it clear that handling contradictions and tensions requires new mechanisms for building consensus. All the stakeholders concerned should be involved in shaping digital transformation. In particular, the involvement of employees in problem-solving is proving to be an important tool in ensuring that the solutions devised actually function in practice. Further information about tensions and how to handle them is provided in the Interim report of the acatech HR Working Group.[16]

Proposition 11: There is a need for new solution spaces if digital transformation is to succeed (2022).

For the digital transformation to succeed, companies must be capable of developing entirely new solutions for shaping their organisation and work processes and implementing them quickly. This is the only way they will be able to cope with the major changes taking place in parallel and build up the necessary resilience. To do so requires new solution spaces.

Based on the experience of the HR Working Group, existing structures, processes and practices are becoming increasingly less suited to react appropriately to the dynamics of change. The majority of companies broadly follow an organisational model developed over a hundred years ago by Frederick Winslow Taylor. According to this model, the assumption underlying organisational management was that it was possible to make continuous improvements to the efficiency and productivity of work by, on the one hand, the separation of planning and implementation and, on the other, by the standardisation and automation of work steps. In the past, standardisation of processes and a high level of automation did indeed lead to significant productivity gains, though also to a decrease in flexibility and in the capacity to make rapid modifications to organisational structure and workflows in order to adapt to new circumstances as required. To manage the transformation, there is now an urgent need to develop new approaches, procedures and organisational models that will strengthen the capacity of the organisation for change and innovation.[17]

15　|　See Wagner/Löw 2023.
16　|　See acatech 2022.
17　|　See acatech 2022.

An important tool for the creation of new solution spaces is the establishment of experimental spaces and real-world laboratories in the company. These offer various target groups and stakeholders the opportunity to conduct specific tests on prospective changes, to devise new solutions in a protected space and to initiate organisational learning processes. Legal and collective bargaining conditions relating to large real-world laboratories still require clarification, but such laboratories have the advantage of ensuring that employees can be directly involved and their experience properly utilised.

There is an urgent need for action, especially because, in the view of experts, the direct productivity gain from digitalisation will not be sufficient to offset the decline in the working population as a result of demographic trends. It is therefore all the more important that the potential of the labour force is exploited, dormant talent is mobilised and at the same time enthusiasm is generated for the digital world of work.[18]

Proposition 12: „Digital culture" is becoming a central capability for ensuring the success of digital transformation (2022).

As has already been highlighted in the HR Working Group's Interim report, the development of a digital culture is becoming a crucial feature in international competition. The term "digital culture" comprises all the values, principles, practices and procedures within an organisation or society that enable it to take advantage of the opportunities offered by digital technologies,

to implement the associated changes rapidly and to generate enthusiasm among the workforce for working together on transformation. A high level of digitalisation and a strong digital culture contribute significantly towards maintaining the performance of companies, enabling their continual development and ensuring their economic success.[19]

The main characteristics of a digital culture can be defined as follows. A digital culture fosters openness to new technologies and the use of those technologies to improve work processes or enhance business models. It encourages and empowers employees to experiment, as well as respond to new developments, take risks and put forward their own ideas. It provides the freedom for independent self-directed work and supports this through internal corporate structures and human-centred design of processes. It motivates people to use digital technologies to share knowledge, embeds innovation and learning into working practice, and encourages workers to scrutinise existing routines and processes with a critical eye and improve them constantly. Finally, it enables managers and employees to deal with uncertainty and contradictory demands and handle them in a productive manner.[20]

It is crucial that digital culture is put into practice. To do so, the underlying values, principles and attitudes must be shared by all the parties concerned and their implementation supported by appropriate measures on the part of management, social partners and policy makers. This is the only way to sustainably embed the new ways of working and to use employees' skills and competences to shape the transformation. This in turn requires trust in the motivation and self-management skills of employees as responsible designers of their own working world.

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18 | See Achleitner et al. 2023.
19 | See acatech 2022.
20 | See Boes/Langes 2019; see Rowles/Brown 2017.

Outlook

Even within the past year, circumstances surrounding business and work have changed in many respects. In view of climate change and the energy crisis, the defossilisation of industry has been gathering pace, requiring profound structural transformation. The shortage of labour and of well-trained skilled workers is being exacerbated by demographic change and risks becoming a serious obstacle to growth and transformation for the German economy. Finally, technological upheavals are occurring in ever shorter cycles, presenting companies with the challenge of making constant adjustments to their work organisation.

This report sets out specific approaches to shaping the current transformation processes in a sustainable and future-oriented manner from an economic, social and environmental perspective. The digital transformation in particular provides the opportunity to make work more flexible, more productive and better, to increase the innovative capacity of companies and to ensure prosperity and employment.

Given the pace of change, it is essential to continually evaluate where work is heading in the future. The HR Working Group will continue to address and expand on the transformation of work in further top-level discussions in its "Fit for Future Work" series of debates. The aim is to obtain a comprehensive overview of the impact of the digital transformation on the world of work and, in line with acatech's mission, to think ahead about the future of work in an independent and based on evidence and the common good.

HR Working Group – Forum for Chief Human Resources Officers (CHROs) on the future of work

The HR Working Group is acatech's forum for bringing together prominent figures from business and academia for a confidential strategic dialogue on issues relating to securing innovation-relevant skills in Germany and for shaping digital transformation. The HR experts exchange views on how the opportunities offered by digitalisation can be realised in the world of work and how companies, employees, employers and works councils and policy makers can shape this transformation together. The exchange of views within the HR manager ecosystem is helping to develop a common understanding of future issues and possible policy recommendations. Only through ongoing dialogue with policy makers can the jointly developed demands for legislative changes and adjustments be tailored to operational requirements.

The majority of members of the HR Working Group are HR Directors of leading technology and service companies. The hosts are Henning Kagermann, Chair of the acatech Board of Trustees, and Frank Riemensperger, acatech Executive Board member.

The HR Working Group comprises the following members:

Julia Bangerth | Datev eG; Dr. Sebastian Beck | Festo SE & Co. KG; Khadija Ben Hammada | Merck KGaA; Sabine Bendiek | SAP SE; Dr. Sebastian Biedenkopf | Fresenius SE & Co. KGaA; Birgit Bohle | Deutsche Telekom AG; Susan-Stefanie Breitkopf | Carl Zeiss AG; Markus Fink | Infineon Technologies AG; Stefan Grosch | Robert Bosch GmbH; Dr. Immanuel Hermreck | Bertelsmann SE & Co. KGaA; Ilka Horstmeier I BMW AG; Dr. Achim Kassow | Munich Re; Ildiko Kreisz I Accenture DACH; Dr. Claudia Mayfeld | Knorr-Bremse AG; Sabine Mlnarsky | Commerzbank AG; Dr. Thomas Ogilvie | Deutsche Post DHL Group; Prof. Dr. Manfred Prenzel | Universität Wien; Prof. Steffi Robak | Leibniz Universität Hannover; Petra Scharner-Wolff | Otto Group; Corinna Schittenhelm | Schaeffler AG; Martin Seiler | Deutsche Bahn AG; Prof. Dr.-Ing. Dieter Spath | TÜV Rheinland Berlin Brandenburg Pfalz; Prof. Dr. Isabell M. Welpe | Technical University of Munich

Fit For Future Work – Overview of the DEBATES
The series of debates conducted by the acatech HR Working Group included the following discussions in 2023:

25.01.2023 | Shaping the digital transformation – Interim conclusion and outlook for 2023

16.03.2023 | The future of HR management – What role will our new colleague AI play?

03.04.2023 | Data-driven decisions in the organisation – Friend or foe for individuals and companies?

26.04.2023 | IQ? EQ? TQ! Laying the foundations within a company for the digital transformation

22.05.2023 | Co-determination, a key factor in the success of the digital transformation

27.06.2023 | Getting the green light? – How a future-oriented HR strategy drives the green transformation

15.11.2023 | Turning point in the world of work? Trends, implications and theses

05.12.2023 | HR strategy in uncertain times: geopolitics, resilience, agility

Further information

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Research, text and editing:

Dr. Caroline Adam
Manager Strategic Projects, acatech
(adam@acatech.de)

M. A. Elisabeth Vogl
Scientific Consultant, acatech
(vogl@acatech.de)

Dr. Felix Biermann
Senior Manager Strategic Projects, acatech
(biermann@acatech.de)