

Life, Work, Education 2035+

Changes driven by Artificial Intelligence in key areas of life

MÜNCHNER KREIS Future Study Part VIII

> INC. SPECIAL CHAPTER: mpact of the Corona pandemic on Al technologies



MÜNCHNER KREIS FUTURE STUDY

PARTVIII

The concept behind the "MÜNCHNER KREIS Future Studies."

In using the concept of the Future Studies, the MÜNCHNER KREIS aims to provide orientation in a world of digital transformation and disruption. As a leading, independent forum providing orientation for planners and decision makers in the digital world, the MÜNCHNER KREIS initiates and coordinates future studies on current or key issues.

In order to realize its objective of providing orientation and a framework for the future, the analysis goes deliberately beyond the medium-term perspective of three to five years, over which we can no longer exert much influence.

Artificial intelligence (AI) technologies are an important component of the digital transformation and are being increasingly integrated into products and services. They are regarded as a key technologies and drivers of (digital) innovations. However, the more rapid the development in the field of AI, the louder the critical voices become. There is much uncertainty in many quarters as to how the use of AI technologies will affect our lives. The MÜNCHNER KREIS Future Study Part VIII aims to investigate the future form of as well as the systemic connections between life, work, and education under the influence of AI technology. Changes in central areas of life driven by AI technologies serve as the starting point for the study, which provides a human-centered perspective to the research. The focus on the systemic impact of the interplay between life, work, and education aims to provide orientation for shaping the future.

With this approach, the MÜNCHNER KREIS remains true to its principle of highlighting and critically analyzing relevant themes in the digital world in order to provide orientation in the digital transformation. The research does not just address decisions makers from the fields of business and politics, but also recognizes the individual citizen as an important actor in a digital future.

The MÜNCHNER KREIS has adhered to this multidisciplinary approach since the first phase of the study was launched in 2008. Working with a partner consortium from the fields of business, academia, and politics/ administration results in a variety of perspectives and, at times, controversial discussions. An important characteristic of a future study is that the research process is designed together with the partner companies throughout, and the results are discussed continuously with them, further developed, and summarized into findings. This is a continuous process in which the partners take on different roles—human, citizen, company representative—thereby creating a variety of perspectives.

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Opening Remarks Bavarian State Minister for Digital Affairs



Whether for regulating the flow of traffic in cities, optimizing voice control for barrier-free technologies, or for the use of robots in the care sector: AI has found its way into our lives and fundamentally changed them. This shows that AI is one of the key technologies of the future that we must and can use to ensure that our high-tech location remains at the international forefront of economic and academic development.

In Europe, at a federal level, and within Bavaria itself, we have already been able to report major successes. Through the Hightech Agenda Bavaria, we are setting important impulses, particularly in the area of Al. At the same time, the EU is working on "Al Made in Europe," and the federal government has taken an important step towards promoting Al development with the German Al strategy.

Two things are particularly important to me concerning the path we are taking with these measures. Firstly, the measures we have taken are only the beginning. While AI is already shaping our lives, our work, and our education, its potential is far from exhausted. We are only just beginning to understand what is possible and, to be honest, what, despite AI, will not be possible in the foreseeable future. In order to continue to play a leading role internation-ally, it is vital that we invest in new technological approaches, new business models, and, above all, in bright minds.

Secondly, we must learn to consider AI from the human perspective. The use of AI must be in the interest of everyone, not just a few companies or countries. We want to apply our values to AI applications and protect the underlying data in accordance with our standards. I am convinced that this is the only way that there can be a European, German, and Bavarian AI development path that will allow us to remain globally competitive.

With this study, the MÜNCHNER KREIS is making an important contribution to broadening our understanding of Al. As the official patron, I am proud of the result and would like to thank all the participants in the study for their commitment. I would also like to thank the MÜNCHNER KREIS team and the numerous helpers who made this study possible.

I hope you enjoy reading this and that you gain many new insights.

Judith Gerlach,

Bavarian State Minister for Digital Affairs, Bavarian State Ministry of Digital Affairs

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The Partners of the MÜNCHNER KREIS Future Study Part VIII

PATRON

Bavarian State Ministry of Digital Affairs

PUBLISHER

MÜNCHNER KREIS e.V. Bertelsmann Foundation

MAIN SPONSOR

Fujitsu Technology Solutions GmbH

SPONSORS

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Innovationszentrum für Industrie 4.0 GmbH & Co. KG ITM Consultancy mbH

Opening Remarks MÜNCHNER KREIS and Partners

The MÜNCHNER KREIS Future Study Part VIII focuses on the topic of artificial intelligence in the context of life, work, and education. This is a challenging yet extremely compelling perspective that has received little attention in previous studies on the topic.

Due to the interdisciplinary background of the group of partners involved in this study, it was possible to approach the complexity of the topic from a wide variety of perspectives. The common starting point of the research process was an open discussion on the key issues in a future permeated by Al. In this way, it was possible to establish a common understanding of the topics among all those involved and to formulate the cross-perspective objectives of the study:

- ightarrow Provide orientation amid rapid changes in life, work, and education, with a focus on digital transformation brought about by AI-technologies
- → Pinpoint new premises, development possibilities, and goals for the shaping and functioning of the future society and its components (people, companies, institutions)
- ightarrow Develop guidelines that can be used to redefine and shape each individual's role within the systems

At least one overarching conclusion can be drawn from the interdisciplinary and open research process of the past months:

Given its immense significance for business and society, artificial intelligence has implications for almost all disciplines. In the future, the related issues must be discussed and developed more intensively in all their facets—even if not all the scenarios that are currently being construed in the wake of this topic will come to pass.

The MÜNCHNER KREIS and its partners would like to thank all the experts who have contributed their knowledge and experience to identifying and developing the central issues and challenges of an Al-driven future. The insights gained are intended to provide suggestions and impulses for the prudent design of a human-centered world of life, work, and education.

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Opening Remarks Bertelsmann Foundation

For years, a narrative of danger has dominated the debate in Germany surrounding the role and impact of artificial intelligence in today's working and living environment.

While up until the early 1970s, Germany was still enthusiastic about technology and open to technical innovations, at some point this potential-oriented perspective shifted to one of technical skepticism, which ultimately is probably why Germany is no longer at the forefront of digital infrastructure and the development and application of market-oriented artificial intelligence in global comparison.

With this study, we want to contribute to helping this country turn away from the danger narrative and increasingly turn back to the opportunities that artificial intelligence offers for our everyday lives and work. It is not about succumbing to blind faith in technology; rather, with the help of the interviewed experts from around the world, we hope to regain a clear view of the risks and, above all, the opportunities. We are therefore pleased to be able to present a result that, firstly, presents concrete ideas about the role of digitally based technology in the coming years. Secondly, it outlines implications for society as a whole and our working lives, and thirdly, it examines the changing roles of the actors involved — politics, business, society, and the individual — in a technology-based future. Thus, we will not all become pawns of technology, but rather, using this knowledge, we will be able to proactively shape our relationship to digital technology early on.

Partner Statements



Judith Gerlach, Minister of State for Digital Affairs, Bavarian State Ministry for Digital Affairs

"We are only just beginning to understand what is possible. With this study, the MÜNCHNER KREIS is making an important contribution to broadening our understanding of Al. As the official patron, I am proud of the result."



Lars Attmer, Managing Consultant Agility, New Work & Culture, Detecon International GmbH

"Al and Data Thinking is not just a question of IT specialists. Successful companies establish adaptable organizational structures (Company Re-Building) as well as a sustainable change & learning culture in order to exploit the potential of Al with actors from all areas."



Prof. Dr. Helmut Krmcar,

Chairman of the Research Committee, MÜNCHNER KREIS e.V.

"Al technologies are an important driver of digitalization. These technologies will have a fundamental impact on life and society. It is up to all of us to work out the details of how Al should be shaped, i.e., how we define trust and progress along the way. The MÜNCHNER KREIS is at hand to provide orientation."



Manuela Mackert, Chief Compliance Officer, Deutsche Telekom AG

"The goal of any technological development should be not only to optimize processes and achieve economic efficiency, but at the same time to improve people's lives and preserve their independence."



Dr. Michael Bolle, Member of the Board of Management, Robert Bosch GmbH, Chief Digital Officer and Chief Technology Officer

"Artificial intelligence should serve the people. Despite all its technological possibilities and opportunities for life, education, and work, we have a responsibility to draw ethical boundaries. With our Al Code of Ethics, we at Bosch set clear guidelines for the development of intelligent products so that people can trust them."



Klaus Eberhardt, Managing Director, iteratec GmbH

"AI will support our work—composition of teams, suggesting or accepting decisions. The resulting freedoms will reduce our working hours or, more likely, allow us to engage in more meaningful activities."



Dr. Ole Wintermann, Senior Project Manager, Bertelsmann Stiftung

"The prospect of digital technology should not terrify us. Let us take responsibility for shaping our digital future proactively with our own interests in mind."



Dr. Philipp Ramin, CEO, Innovation Center for Industry 4.0 GmbH

"The importance of positioning AI technologies at the center of society is becoming very clear. Only when people understand the principles, the opportunities, and the risks of the new developments will we be able to leverage the great potential. To achieve this, a genuine learning culture is needed."



Dr. Petra Wolf, Digital@M GmbH

"Just how we propose to use AI in the future must be determined jointly by manufacturers and users in dialog with one another. User-centeredness also means implementing ethical requirements. The prerequisite for this is a basic understanding of the function and effects of AI."



Dr. Joseph Reger, Fujitsu Fellow, Chief Technology Officer Central and Eastern Europe, Fujitsu

"As far as our lives in the future are concerned, we need Al in two areas: in urban and in rural settings. For both, we need the same thing, and we need it fast: joint, coordinated actions and standards. The acceptance is clearly there."



Sebastian Wieczorek, Vice President Machine Learning for SAP Data Intelligence

"The Future Study shows that AI will continue to extend its influence to all areas of life. AI must serve, ease the burden on, and support people—as well as be used ethically and responsibly. A legal framework must be in place to ensure this."



Dr. Stefan Zerbe, Managing Director, ITM Consultancy mbH

"The study shows that AI is technology-driven, but the impact of AI is realized in close collaboration between humans, society, and technologies. Companies are now developing architectures in order to invent intelligent products and touchpoints for their customers."

Executive Summary

Since 2008, the MÜNCHNER KREIS has published a series of studies with the goal of shedding light on key issues in the digital world from a variety of perspectives, critically examining them, and thus providing orientation in the digital transformation. In this eighth phase of the future study, the focus is on the changes driven by Al technologies in the three central areas of life itself: life, work, and education.

> The examination of the future deliberately goes beyond the typically predictable time horizon of five years, alternates between quantitative and qualitative research, investigates path dependencies, and constantly engages in dialog with the partner consortium.

Depending on one's perspective and academic discipline, artificial Intelligence (AI) can be defined in many ways. In line with the European Commission's working group "High-Level Expert Group on Artificial Intelligence," a relatively broad definition was used in the first wave of the survey, which in essence states that AI analyzes its own environment and derives actions from it (partly autonomously) itself. During the second wave of the survey, this general definition was expanded and the experts were able to draw on four different types of AI to flesh out the results, which differ in terms of underlying AI capabilities (c.f. chapter Understanding of AI in the Study, p. 28).



In the spirit of an open research process, the topics were narrowed down, and the specific propositions were developed on the basis of a qualitative cluster evaluation that reflected the interests of the group of partners. The starting point of the research process was the following guiding question: "What concerns you the most when you think about AI in the future in relation to 1) you as an individual, 2) your company, 3) society?" The partner consortium developed 53 propositions, which were evaluated in a future Delphi study by experts from the field of digitalization and technology (468 experts for Germany in Wave 1 and 326 experts in Wave 2). (For detailed information, c.f. Method: An Overview, p. 22).

In the following — divided into the three areas of life, work, and education — the findings (central study results, opinions of the experts interviewed) and the implications derived from them (recommendations and possible measures, discussion in the partner consortium) are presented.

SUMMARY



Key findings

For the area of life, 18 future propositions were developed. The six propositions that are likely to be realized in the next ten years show the contrast between an already implicit use of AI technologies on the one hand (e.g., use of voice assistants) and a certain social skepticism toward AI on the other. Central issues that emerge include the need for a technical control authority for AI-based products and services and a discussion about the role of AI technologies for the competitiveness of Germany as a business location. Overall, the experts' perception that AI technologies offer positive potential in many areas of life predominates, whereas propositions that address the topics of "loss of privacy" or "being human" are considered less likely to be realized.

Implications

- The goal must be to achieve a basic understanding of Al throughout the general population and to stimulate an open, fact-based, and trustful social discourse on Al technologies. This can be achieved through an institutional information strategy that involves various disciplines and clearly identifies the benefits and risks of Al technologies. Appropriate media formats could help to address the issue among the general public.
- 2. Al technologies are already available now. The confrontation with Al must therefore start immediately and as early as possible. This requires the prompt and interdisciplinary incorporation of Al into school and adult education curricula.
- 3. The use of AI technology requires interdisciplinary and (inter)nationally defined standards and guidelines in order for the potential of the new AI technologies to be unleashed. Maturity, user-centeredness, transparency, degree of data quality, anti-bias mechanisms, and compliance with informational self-determination are framework parameters that must be used as necessary test criteria in the standardization of interfaces.
- 4. Core principles are required that guarantee the observance of ethical principles and the preservation of legal protection for all citizens.

Work

Key findings

For the area of work, 19 future propositions were developed. The seven propositions that are likely to be realized in the next ten years are primarily concerned with the possible changes to people's everyday working lives brought about by AI technologies. At the forefront is the importance of human competence and performance in a working world supported by AI technologies. Increasing transparency in work performance, changing fields of employment, and greater interaction with AI systems are to be expected. Opportunities for creative work and the individual development of human strengths will also emerge. The tasks and role of "leadership" will be redefined. The experts believe that propositions involving a "loss of control" or a "loss of human superiority" are unlikely to be realized.

Implications

- Employers and employees should enter into an equal, impartial, and open dialog with each other about the use and consequences of Al in business practice. The aim must be to connect human strengths with the potential of Al technologies and to create transparency about the use of Al systems in companies. This is particularly applicable with regard to performance tracking as well as the Al-based configuration of teams.
- 2. The dissemination of best practice examples can help to build basic knowledge and increase acceptance. The high usability of AI applications also helps to reduce user inhibition.
- 3. Al technologies are dynamic; this means that the possibilities and limits for the use of Al technologies must be continuously discussed and adjusted. The transparency of the algorithms is especially important in order to understand where the technical and ethical boundaries should lie. The identification and avoidance of bias (e.g., in HR planning) have high priority here.
- 4. Continuous training and further education of the workforce is a core requirement for leveraging the potential of AI. Training and further education must be consistently promoted and demanded in order to keep pace with technological developments and the ensuing changes in job profiles. The specific competencies of the employees must remain in the foreground in order to achieve the best possible benefit for those at the human-machine interface.
- 5. Rules for dealing with interactions between AI technologies and work performance in the company must be anchored in labor law.
- 6. To increase trust in Al technologies, companies should work towards ensuring that Al assistants are consciously assigned rights by the user (calibration) and that users can set the appropriate limits.

Education 🗢

Key findings

For the area of education, 16 future propositions were developed. The four propositions that are likely to be realized in the next ten years focus on the changes in (educational) society resulting from changing professional requirements and new job profiles. Closely linked to this is the question of which human skills will be relevant and which tasks will be supported by AI technologies in the future. The increased use of AI technologies in private and working environments will thus lead to an increase in the importance of the education system. In order to leverage the potential of AI technologies for the benefit of as many people as possible, it is necessary to examine and further develop the relevant educational content as well as the learning and teaching methods. According to the experts, however, it is not expected that AI technologies will lead to a complete dissolution of the existing education system.

Implications

- In the context of the AI discussion, the education sector bears a special responsibility: Its
 task is to establish a broad transfer of knowledge and applications both inside and outside educational institutions starting at the primary level and continuing on in vocational, state as well
 as informal further education programs. Education is thus a key potential driver for the further
 development of AI technologies.
- 2. In the future, education must be lived out in an even more interdisciplinary and transdisciplinary way. This means that AI in the educational context must not be a purely technological topic, but must always take other disciplines (e.g., pedagogy, psychology) into account. This requires close cooperation between the responsible politicians (societal perspective) and experts from various disciplines.
- 3. Through AI technologies, the education of tomorrow will increasingly offer opportunities to be more individual and people-oriented. One challenge will be to find the right balance between compulsory content (in the school context, e.g., cultural practices) and the nurturing of individual strengths (e.g., creativity). Overall, the education sector should focus on job descriptions (rather than on traditional job profiles) in the future.
- 4. In addition to the ability to apply AI confidently, comprehensive AI competence also includes the ability to critically assess the use and control of AI. The question of the appropriate use of and level of trust in AI technology must be addressed at various levels: on a personal level (in the sense of an ethical understanding) as well as at the regulatory level.
- 5. Al technology should serve the good of the people, i.e., valuing and accepting humans and their humanity must have top priority. In a society in which Al will play an increasingly important role, there is an opportunity for knowledge and information to become more democratized and for Al technologies to be used as a common good for society as a whole. Social, value-based, and sustainable business will thus become even more important.

Executive Summary



Systemic Perspective: The overall impact of AI technology

on life, work, and education.

In addition to the results in the individual areas of life, work, and education, it was also possible to derive five overarching impacts across all three areas of life by means of a clustering process following the first wave of the survey. In this context, the term "impact" can be interpreted more broadly in the sense of potentials, opportunities, but also challenges. The five dimensions are as follows:

- A sense of purpose for the individual
- **†** Changing interpersonal relationships
- Let Consensus in society
- Evaluation processes
- Regulatory parameters

These dimensions can be found in all propositions and can be seen as indicators for the overarching influencing factors for the use of Al technologies. The experts' assessments in the second wave of the survey ultimately confirm that, on average, Al technologies will have a strong to very strong influence on these five dimensions (for detailed information, c.f. Al Dimensions, p. 31). It can be concluded from this that a consistent holistic approach is required for the design of future Al developments as important design parameters in the individual areas ultimately overlap considerably. Given the magnitude of this task and the potential it offers, it will require not only an extensive use of resources, but also intensive and solid cooperation on the part of all those involved. An overview of the results shows that from the perspective of the experts interviewed, the discussion on the topic of AI has already become more user-centered in recent years and the focus on technology has receded somewhat into the background. Since AI technologies are already in many ways an integral part of our living, working, and educational worlds and this development will continue, it is imperative that the topic descends from its subject-specific ivory tower and is subjected to a more wide-ranging discussion based on broad social discourse. The development and use of AI technologies should always be considered in terms of humans (i.e., users, citizens, consumers, workers, etc.). In this way, AI technologies can effectively support humans in their future challenges. Politics and society need to develop a common vision of the desired scenario with AI technology that makes the interplay between various individual issues (e.g., conflicting goals and contradictions) tangible and forms the basis for developing a positive narrative to raise awareness and promote acceptance as well as for identifying regulatory, developmental, and educational needs.

Recommendations for Policymakers

Development of a regulatory framework that provides increased transparency in the development and use of algorithms (on the basis of already existing considerations in politics and civil society). In particular, the rapid implementation of standards and guidelines for the development and use of Al technologies. The aspects of ethics, user-centeredness, transparency, degree of data quality, anti-bias mechanisms, and compliance with informational selfdetermination must serve as important framework parameters.

TIMESPAN: 1–2 years

Ultimately, AI should always serve the good of the people. With an appropriate regulatory framework (e.g., standards, guidelines, funding), policymakers must ensure that knowledge and information are democratized and that AI technologies are understood as a common good for society as a whole, especially when they have a systemic impact (Corona App).

O TIMESPAN: 3–4 years

Build a basic understanding of Al throughout the population (for example, following the Finnish model) in order to foster acceptance and a fact-based and respectful public discussion.
Policymakers should initiate communication strategies that incorporate different disciplines and clearly identify the benefits as well as the risks of Al. This would lead Europe down a third, human-centered path that lies somewhere between the world of values represented by China (complete surveillance) and the USA (data is the new oil).

TIMESPAN: 3–4 years

Comprehensive support and further development of the education sector in order to establish a large-scale transfer of Al knowledge and applications (Al as a learning method as well as a subject) in educational institutions, starting at the primary school level and continuing on to vocational or state-run further education programs. To this end, integrate the potential-oriented understanding of Al and its impact into all school, university, and adult education curricula.

Policymakers are called upon to act more boldly, quickly, and consistently.

TIMESPAN: 1-2 years

Comprehensive support for workplace training and further education to keep pace with developments and the associated changes in job profiles. Aim: to hone the specific skills of employees in order to achieve the best possible benefit for those at the human-machine interface. Policymakers should create the appropriate conditions for companies to assume their responsibility more fully in

education and training, and especially in lifelong learning.

TIMESPAN: 1–2 years

Promote an inter- and transdisciplinary education system for Al. This means that policy-makers should work on an Al educational approach that always considers all disciplines (e.g., pedagogy, psychology). This requires significantly more intensive cooperation between the responsible politicians (societal perspective) and experts from various disciplines..

TIMESPAN: 1–2 years

Encourage and support an open dialog between employers and employees on the diverse uses and consequences of AI in business practice.

TIMESPAN: 1–2 years

Policymakers are called upon to work together with em-ployer and employee representatives to develop rules to govern the impact of AI use on work performance in the company. This includes sustainable definitions for terms such as "work," employee involvement, 'Compatibility 4.0', and "working time."

TIMESPAN: 3–4 years

The 8 phases of the Future Study over Time



Method: International Delphi study (quantitative expert survey)

THE FUTURE AND SUSTAINABILITY OF GERMAN INFORMATION- AND COMMUNICATION TECHNOLOGY AND MEDIA

2009

user survey

7.231

Respondents

Method:

International quantitative

FUTURE VISIONS OF THE DIGITAL WORLD. USER PERSPECTIVES IN INTERNATIONAL COMPARISON

2011

2008

THE FUTURE AND SUSTAINABILITY OF GERMAN INFORMATION- AND COMMUNICATION TECHNOLOGY

Method:

Preliminary survey of MÜNCHNER KREIS members, members, secondary analysis and quantitative expert survey in Germany

> 538 Respondents

2010

OPEN FOR THE FUTURE — OPEN IN THE FUTURE. COMPETENCE, SAFETY, AND NEW BUSINESS FIELDS

> Method: Internationale qualitative and quantitative expert survey

> > 977 Respondents

2012

MÜNCHNER KREIS FUTURE WORKSHOP 2012. INFLUENCE OF THE END CUSTOMER ON B2B VALUE CREATION PROCESSES

> Method: Expert workshop

50 Participants

7,278

Respondents

Method: International quantitative user survey

AREAS OF INNOVATION IN THE DIGITAL WORLD. THE REQUIREMENTS OF THE DAY AFTER TOMORROW.





Respondents

Method:

Delphi study with 29 international experts (online), 8 expert workshops, and a quantitative survey

MOBILITY. FULFILMENT. SYSTEM. THE FUTURE OF MOBILITY 2025+

2017

2014

DIGITALIZATION: THE ACHILLES HEEL OF THE GERMAN ECONOMY? PATHS TO A DIGITAL FUTURE

Method:

Quantitative expert survey (online) and 8 expert workshops (36 partners)

517

Respondents

2019/20

LIFE, WORK, EDUCATION 2035+

Method:

Delphi study with 513 experts and 5 expert workshops

513

Respondents



PROFILE OF THE METHOD

In the eighth phase of the Future Study, the Delphi method, which had already proven itself in previous phases, was applied. In two survey waves, more than 500 experts evaluated 53 future propositions relating to the areas of life, work, and education. The "future element" common to all propositions was the increasing permeation of our everyday lives by Al technologies.

> Due to the multidimensional nature of the construct "artificial intelligence," an intensive critical examination of the term took place in the partner consortium as well as in the two survey waves (c.f. page 28). Ultimately, however, the study does not aim to provide a comprehensive analysis of AI technologies at the technological level, but rather to use the insights gained to help demystify the topic of AI, to reveal opportunities and risks, and to stimulate discourse. The methodological approach of the project "MÜNCHNER KREIS Future Study" is multi-perspectival and transdisciplinary. The entire research process can be divided into the following phases.

The Research Process in Detail

As is customary in MÜNCHNER KREIS Future Studies, the process also involved an alternation between qualitative and quantitative research elements (particularly workshops and online surveys). The entire research process is depicted below:

Conception phase:

- a. Workshop 0 (Kick-off, 06/05/2019): Study concept and understanding of the term AI
- **b.** Workshop 1 07/23/2019): Conceptualization of propositions

0

c. Workshop 2 (10/02/2019): Development of survey

Research phase:

a. Expert survey—Registration

- b. Expert survey Delphi Wave 1
- Workshop 3 (12/10/2019):
 Discussion of results from Wave 1 and derivation of questions for Wave 2
- d. Expert survey Delphi Wave 2
- Workshop 4 (Online conference 03/24/2020): Discussion of results from Wave 2 and overall summarizing of results ("editorial workshop")

Allocation of the propositions

0

(Random Distribution Wave 2)

In the second wave of the survey, the propositions were distributed randomly among the experts in order to avoid a fatigue effect when filling them out—thus, each expert only received one third of all propositions to consider. To this end, two separate samples were drawn:

\rightarrow Dividing the propositions into three groups

(each with the same structure with regard to the subject areas of life, work, and education)

ightarrow Dividing the experts into three groups

(each with the same structure in terms of relevant characteristics such as type of organization, years of experience, etc.)

Profile of the Interviewed Experts

513 international experts

Of these, 468 experts evaluated the propositions for Germany (Wave 1)

Profile of the German experts

- \rightarrow **78%** male
- \rightarrow Average age: **48 years**
- \rightarrow 40% have over five years' experience in the field
- \rightarrow 69% work in the private sector
- ightarrow 15% work in the academic field

Life, work, and education under the influence of Al

LIFE, WORK, EDUCATION How strong an impact will AI technologies have on each of the different sectors over the next 10-15 years?

Al technology will have a major impact on our future lives. This conclusion could already be drawn from the results of the registration phase prior to the actual Delphi interviews with the experts. Al technologies will have a particularly strong impact on the areas of mobility, work, health and nursing care, and media.

But what actually is "artificial intelligence"? How can we grasp and shape this new technology? How should we define it? What impact will it have and how will we as humans be personally affected? This chapter addresses these questions with the aim of introducing the reader to the overarching theme of the study "Life, Work, Education 2035+." Furthermore, the reader is given a thematic overview of the 53 future propositions of the Delphi survey and their impact on business and society.



LIFE, WORK, EDUCATION

Understanding of AI in the Study

The construct artificial intelligence and AI types

Artificial intelligence or technologies can be viewed from different perspectives, broken down into different dimensions, and defined in very different ways. For the first wave of the study, the following definition from the European Commission's "High-Level Expert Group on Artificial Intelligence" was used*:

"Artificial intelligence (AI) systems are software (and possibly also hardware) systems designed by humans3 that, given a complex goal, act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the knowledge, or processing the information, derived from this data and deciding the best action(s) to take to achieve the given goal." In the second wave of the survey, this general definition was somewhat expanded. The experts worked with four different "AI types**" here that differed according to their underlying AI capabilities. The aim was to understand even better which "AI strength" the respondents assume for each proposition.

The experts were first asked to estimate at which point in time each of the four types of AI technology will have achieved widespread use, i.e., will be part of many products and services used in our daily lives.

The experts agreed that AI technologies with purely reactive properties (Type 1) will already be an essential part of the products and services used in our everyday life in the coming years. The experts estimate that AI technology with limited memory (Type 2) will also become more common by 2024 and will have achieved widespread use by the end of the 20s. The prediction of when AI technologies with Theory of Mind (Type 3) will become part of our everyday lives, on the other hand, is more diffuse; but that it will happen, of that the experts are certain. Just over half of the experts surveyed believe that a self-aware AI technology (Type 4) is unlikely to ever exist. By the same token, almost as many experts assume that this development will come – albeit in the distant future.



** see https://learn.g2.com/types-of-artificial-intelligence

The 4 Types of Al



TYPE 1 Reactive Al

The AI system perceives situations immediately and acts solely on the basis of the information it receives (e.g., Deep Blue Chess developed by IBM).

ESTIMATION OF WHEN THIS TYPE OF AI WILL HAVE ACHIEVED WIDESPREAD USE: (All figures in percent)

	87
2020-2024	
10	
2025–2029	
1 2030–2034	
1 2035+	
0 Probably never	



TYPE 2 Limited Memory Al

The AI system considers information from the past and adds it to programed representations of the world. (e.g., self-driving vehicles, chatbots, virtual assistants).



TYPE 3 Theory of Mind Al

The AI system interprets thoughts and emotions that influence human behavior (e.g., R2-D2 from Star Wars).



TYPE 4 Self-aware Al

The AI system develops a self-awareness, is conscious of its own inner state, and can predict the feelings of others (e.g., Eva from Ex Machina, where the robot is not distinguishable from the humans).

ESTIMATION OF WHEN THIS TYPE OF AI WILL HAVE ACHIEVED WIDESPREAD USE: (All figures in percent)



LYPES OF AI

HEN THIS TYPE OF AI

ESTIMATION OF WHEN THIS TYPE OF AI WILL HAVE ACHIEVED WIDESPREAD USE: (All figures in percent)



ESTIMATION OF WHEN THIS TYPE OF AI WILL HAVE ACHIEVED WIDESPREAD USE: (All figures in percent)

1 2020–2024

26 2025–2029

37 2030–2034

31

2035+

5 Probably never

Al-Technology 2035

Expectations of AI in the future

In addition, it was important to find out what qualities the experts thought a future AI technology should have in the year 2035. In the second wave of the survey, they were thus presented with a "polarity profile" featuring verbal pairs of opposites at the respective poles.

"It is vital that the AI of the future is both transparent and serves the interests of the general public."



AI IN 2035 SHOULD BE...

30

The use and design of AI is not a topic driven exclusively by technology. The social discourse on the acceptance of its deployment and use (technology assessment) will have an increasing influence on the development of AI technologies. One of the findings of this study is that this has an impact on every individual and on the structure and design parameters of our society as well as business and politics. The study results also clearly show that significant changes are to be expected in all areas (of life) and disciplines, which is why the topic of AI is one of great importance.

Artificial intelligence—a topic that all disciplines must address!

In the context of this discussion and the analysis of the results of the first survey wave, five human-centered dimensions were identified on which Al technologies will have a particularly strong impact in the future. This perspective was chosen in order to fulfil the requirements of human-centered research.

Human-Centered Dimensions

AI Dimensions

0

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- A sense of purpose for the individual (Focus on oneself)
- **2.** Changing interpersonal relationships (Interaction between individuals)
- 3. Consensus in society (Individuals as part of a societal framework)
 - Evaluation processes
 (Appraisal / performance measurement)
 - 5. Regulatory parameters (e.g., laws)

Human-Centered Dimensions

In the second wave of the Future Delphi survey, the experts were asked to consider how strong an impact each proposition will have on each dimension.

Overall, the survey results clearly show that the underlying hypothesis "AI technologies have an impact on life, work, and education" is confirmed by the experts, and for each proposition it can be assumed that its realization will have a strong to very strong impact on most of the dimensions addressed.

This feedback is also reinforced by the international experts in the Future Delphi who were asked in Wave 2 of the survey to comment on the five dimensions and to make recommendations to policymakers, business, academia, and society (see also Executive summary, page 12ff). In summary, the demand for AI technology "for the benefit" of the people is also clear here.



Referencing the Dimensions

The Dimensions have a comparatively strong Impact on the Propositions listed below them.

Changing interpersonal Relationships

Life No. 16 \rightarrow "Al Nanny", p. 72 Work No. 4 \rightarrow Al-based Team Composition, p.86 Work No. 15 \rightarrow More Freelance Activities, p. 108 Education No. 4 \rightarrow Social Division, p. 126 Education No. 9 \rightarrow Family-own Al Systems, p. 136

Regulatory Parameters

Life No. 5 \rightarrow Technical Control Authority, p. 50 Life No. 13 \rightarrow Rules and Standards, p. 66 Work No. 6 \rightarrow Elimination of Industry Boundaries, p. 90 Education No. 13 \rightarrow State Control of AI, p. 144

Evaluation Processes

Sense of Purpose for the Individual

Work No. 15 \rightarrow More Freelance Activities, p. 108

Work No. 10 \rightarrow New Job Profiles, p. 98

Work No. $1 \rightarrow$ Importance of Human Competencies, p. 80

Education No. $3 \rightarrow$ Impact on Human Capabilities, p. 124

Work No. 2 → Transparency in Work Performance, p. 82 Work No. 3 → New Companies with High Al Usage, p. 84 Work No. 4 → Al-based Team Composition, p.86 Work No. 5 → Identification of New Employment Fields, p. 88 Work No. 9 → Administrative Leadership Tasks, p. 96 Education No. 3 → Impact on Human Capabilities, p. 124

Consensus in Society

Life No. 13 → Rules and Standards, p. 66 Education No. 4 → Social Division, p. 126 Education No. 13 → State Control of Al, p. 144 Expected Realization of the Propositions and the Impact on Business



Competitiveness

Rejection of Al 📕

Depicted here is a complete overview of the classification of the propositions in terms of their realization (estimation of the experts on the time scale) and their impact on business (positive/negative).

NOTE:

NOW

- x-axis = realization (time horizon) => According to the experts surveyed, the further to the left the proposition is positioned, the sooner it will be realized
- y-axis = impact on business => upwards = positive impact; downwards = negative impact



[average ratings in each case].

POSITIVE IMPACT ON BUSINESS





Intercultural Conflicts



NEGATIVE IMPACT ON BUSINESS

Expected Realization of the Propositions and Impact on Society



NOW



NOTE

- x-axis = realization (time horizon) => According to the experts surveyed, the further to the left the proposition is positioned, the sooner it will be realized
- y-axis = impact on society => upwards => positive impact; downwards= negative impact



Regulatory Failure 📕 Social division 📕

36

[average ratings in each case]
POSITIVE IMPACT ON SOCIETY



37

Analysis of all 53 propositions

(Mean values across all questions)

53 propositions were developed by the partners in the areas of life, work, and education. An analysis of the survey data showed that 17 of the propositions are likely to be realized within the next ten years. The propositions are presented in the respective chapters in the order in which they are expected to be realized. All three chapters end with the propositions that are unlikely to ever be realized.

21

2030 - 2034





EARLIEST POINT IN TIME AT WHICH THE GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED* (Results in %)

20

2025 - 2029

12

2020 - 2024

AT THE LEAST, WHICH TYPE OF AI TECHNOLOGY WOULD BE NEEDED TO MAKE THE PROPOSITION A REALITY?** (Results in %)



*SURVEY WAVE 1 Basis: German experts on all three topic areas; n=468 (Question 1); n = 76 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=326; figures in percent; percent missing up to 100=not specified.

23

Probably never

18

Later than 2035

Questions: **1.** At the least, which type of Al technology would be needed for the proposition to be realized? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong) and Bottom2 values (very weak + weak); percent missing up to 100: Position 3 on a scale of 5 (aver-

age) or not specified **3.** Which of the following sectors is currently shaping the discourse on the above-named topic area the most?/Which of the following sectors should shape the discourse on the above-named topic area the most in the future? **4.** In your opinion, how has the discussion on the topic been conducted over the last 3 years?

OVERVIEW OF PROPOSITIONS

Propositions whose realization	Life	Work	Education	Total	
is expected in the near future*	6	7	4	17	
is expected in the distant future **	10	9	11	30	
is not expected***	2	3	1	6	
Total propositions	18	19	16	53	

Proposition DEEP DIVE

(Results in %)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	55
ŤŤ	Changing human relationships5	8
ш	Consensus in society	57
0	Evaluation processes	61
Ø	Regulatory parameters	55

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



THE DISCUSSION ON THE TOPIC OVER THE LAST THREE YEARS HAS BECOME MORE...**



RESULTS

Across all propositions, an average of 32 percent of the experts estimate that the respective proposition will be realized within the next ten years while 39 percent assume that it will be realized after 2030. The average rejection rate is 23 percent.

In sum, the impact of all AI propositions is viewed positively for business and society. In most cases, AI types 2 (Limited memory AI technology, 28 percent) and 3 (Theory of Mind AI technology, 30 percent) are necessary for the realization of the propositions.

Currently, about one third of the discourse on AI topics is shaped by business, while 15 percent of the experts also see technology and academia as drivers. Politics and society are perceived to be leading the discourse in roughly equal proportions (12 and 11 percent respectively), whereas 17 percent of the experts do not name any of these actors. In the future, society (31 percent) and politics (12 percent) should set the tone when it comes to the development and support of AI technologies, with business accounting for only 15 percent.

What is also striking is that the discussion on AI has tended to become more user-centered over the last three years, and the (previously very dominant) focus on technology has receded somewhat—although it still plays the greater role.

 Propositions that at least 40 percent of the experts expect to be realized within the next ten years (and at least 15 percent within the next five years).

** Remaining propositions

*** Propositions to which at least 50 percent of the experts answered "probably never" when asked about their realization

Life 2035+

A total of 18 propositions were developed in the partner consortium for the topic area Life. On the following pages, the propositions are presented in the order of their expected realization. The page opposite shows questions and statements from the partner workshop that examined the tension between life, work, and education. (Workshop 3, December 2019)

Dr. Joseph Reger, Fujitsu Fellow Chief Technology Officer Central and Eastern Europe, Fujitsu

"In the future, a great increase in efficiency will be achieved through digitalization — thus the algorithms form the basis for the modern digital future, along with the data they process. Regardless of the extent to which Al will be part of our everyday lives in the future, this key technology can help us lead more sustainable, efficient, and secure lives; however, people must always remain at the center of this technological development in order to be able to lead self-determined lives. Al can help to address challenges related to demographics, climate change, and urbanization. A legal framework, transparency, privacy, data protection, education, and competitive companies are essential for this. Both the legal and ethical foundations must be laid now, along with investment in education, research, and development, so that our lives can become even more gratifying and sustainable as a result of this technological progress."

Is one's ability to engage in discussion under threat? Those who trust in AI can be Al will reduce sure of always making the What tasks does a urbanization right decision. personal AI system again. assume? Will life be more about recreation or Social structures education? in place today are increasingly dissolving. Will ethical principles The influence of dissolve alongside parents on children industries? will change. Is a fulfilling private life only going to be possible if it includes Al? Where and in which areas will a human accept an Al technology as its equal? LIFE Our lives will be controlled by others.

1. Digital Personal Assistants

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

Al-based "Digital Personal Assistants" communicate autonomously and independently with other Al-based systems.



THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

(Figures in percent



TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** (Figures in percent)



42

*SURVEY WAVE Basis: German experts on the subject area "Life"; n=83 (Question 1); n = 76 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=106; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top 2 (very strong + strong) **3.** Which of the following sectors is currently shaping the discourse on the above-named topic area the



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	42
ŤŤ	Changing human relationships	59
111	Consensus in society	46
0	Evaluation processes	54
Ø	Regulatory parameters	58

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

60 percent of the experts surveyed expect the proposition to be realized within the next ten years, 31 percent expect it to be realized after 2030, and only 2 percent reject the proposition. The impact on business and society is viewed as positive.

Over the last three years, the discussion on the topic of "Digital Personal Assistants" has remained technology-focused, but has also increasingly placed the user at the center of the discussion. Al-based digital personal assistants can have positive effects on business and society, provided society is fully aware of the advantages and disadvantages and a framework is created that transparently limits the processing and storage of data.

IMPLICATIONS FOR POLICYMAKERS DEVELOPED BY THE PARTNER CONSORTIUM

- 1. In order to leverage the economic potential, policymakers should create regulatory conditions that enable AI assistants to carry out "smart contracting."
- 2. Legal clarity is called for, e.g., in liability issues, in the application of the polluter-pays principle, or in the function of "forgetting."

IMPLICATIONS FOR BUSINESS DEVELOPED BY THE PARTNER CONSORTIUM

- International standardization of interfaces (APIs) is important in order to enable communication between assistants. This can be achieved, for example, through the previously initiated first international committee for the standardization of the complete AI ecosystem (ISO/IEC JTC 1/SC 42).
- Companies should work towards ensuring that AI assistants are both consciously assigned rights by the user (calibration) and are able to indicate the appropriate limits to the user.

IMPLICATIONS FOR SOCIETY DEVELOPED BY THE PARTNER CONSORTIUM

- Society as a whole needs to become more involved in the discourse on Al-based digital personal assistants. In particular, there is a need for a discussion to clarify the benefits and risks of Al-based digital personal assistants for individuals.
- 2. Al-based digital personal assistants need defined behavioral and negotiation scope, which should be backed by society.
- 3. Social discourse should be stimulated and accompanied by responsible media activities.

2. Generation AI

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

We are witnessing the emergence of a generation that uses AI systems naturally and intuitively as an integral part of their daily lives (i.e., 24 hours a day, 7 days a week).





THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

(Figures in percent)



TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** (Figures in percent)



44

*SURVEY WAVE Basis: German experts on the subject area "Life"; n=83 (Question 1); n = 80 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=107; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top 2 (very strong + strong) **3.** Which of the following sectors is currently shaping the discourse on the above-named topic area the



"Which style of leadership will assert itself in the next generation?" LIFE

EDUCATION

"Those who rely only on Al systems alone become susceptible to manipulation and are no longer capable of trusting their own or others' opinions."

PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	56
ŤŤ	Changing human relationships	64
111	Consensus in society	56
0	Evaluation processes	55
0	Regulatory parameters	51

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

50 percent of the experts surveyed expect the proposition to be realized within the next ten years, 47 percent expect it to be realized after 2030, and only 2 percent reject the proposition. The impact on business in particular is viewed as very positive.

Over the last 3 years, the discussion on the emergence of the "Generation Al" has increasingly placed the user at the center of the discussion Society and business are currently leading the discourse. From the experts' point of view, society in particular should be involved in shaping the discourse on the topic in the future, and schools will play a special role here.

IMPLICATIONS FOR POLICYMAKERS AND BUSINESS DEVELOPED BY THE PARTNER CONSORTIUM

- 1. Political and business leaders should seek positive role models concerning the design and use of AI technologies and clearly identify both positive and negative impacts of the technology.
- There is an opportunity for the business community to gain the trust of the citizens through transparent products and services (explanation of the underlying algorithms of the AI systems and their assumptions).

MPLICATIONS FOR SOCIETY DEVELOPED BY THE PARTNER CONSORTIUM

- The goal should be to establish a basic Al awareness among all citizens, analogous to the increased data awareness of recent years brought about by, among other things, the introduction of the GDPR.
- In addition, the topic of AI should feature more strongly on the agenda in school lessons in order for pupils to consciously learn how to use these technologies and critically evaluate them at an early stage.
- 3. Conscious interaction with these technologies is essential in order to be able to better assess the social and ethical consequences and to act responsibly.

3. Competitiveness

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

German companies that do not use AI technologies are no longer competitive.





THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

(Figures in percent)





46

*SURVEY WAVE Basis: German experts on the subject area "Life"; n=83 (Question 1); n = 68 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=107; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top 2 (very strong + strong) **3.** Which of the following sectors is currently shaping the discourse on the above-named topic area the



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	33
ŤŤ	Changing human relationships	34
111	Consensus in society	54
0	Evaluation processes	50
Ø	Regulatory parameters	47

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

51 percent of the experts surveyed expect the proposition to be realized within the next ten years while as many as 14 percent reject it. The impact on business and society is viewed as negative.

According to experts, business is currently shaping the discourse and will continue to do so in the future. Al will become a key competitiveness factor in the coming years. While the discourse today is of a more economic-technical nature, in the future, it will also be more user-centered in the socio-political sphere.

IMPLICATIONS FOR POLICYMAKERS AND BUSINESS DEVELOPED BY THE PARTNER CONSORTIUM

- 1. Competencies for the use of AI are required immediately. Education policy support is imperative for ensuring labor market stability and competitiveness.
- 2. Interdisciplinary teaching of ethical principles is imperative. This includes the adaptation of training programs and the continuous development of AI technologies.
- **3.** Digital-ethical competencies and tools are to be implemented in order to demonstrate application relevance.
- 4. Cutting-edge research is the foundation for international technology leadership based on the EU's ethical framework.
- 5. The maxim: Responsible coding must take ethical factors into account even if development time and costs increase as a result.

MPLICATIONS FOR SOCIETY AND THE INDIVIDUAL DEVELOPED YY THE PARTNER CONSORTIUM

- 47
- 1. To achieve widespread acceptance, an open and fact-based social discussion is necessary.
- 2. Transparency and trust must be established as fundamental ethical principles of AI.

4. Audiovisual Communication

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

In audiovisual communication, it is no longer possible to distinguish between a real person and an Al system.



THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS **EXPECT THE PROPOSITION TO BE REALIZED***





***SURVEY WAVE Basis:** German experts on the subject area "Life"; n=83 (Question 1); n = 73 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified

****SURVEY WAVE 2 Basis:** German experts; n=113; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? 2. How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top 2 (very strong + strong) 3. Which of the following sectors is currently shaping the discourse on the above-named topic area the

WORK

"Will there be negative repercussions for a company if they admit to using bots in customer communication?"

LIFE

EDUCATION

"Basic teaching can be taken over by Al systems in the future. For complex contexts, real teachers should remain responsible."

PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	58
ŤŤ	Changing human relationships	.74
111	Consensus in society	66
0	Evaluation processes	60
Ø	Regulatory parameters	65

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert surveys)

46 percent of the experts surveyed expect the proposition to be realized by 2029. The impact on business is viewed as positive while the impact on society is viewed as negative.

According to experts, the discussion on the topic of "Audiovisual Communication" has remained technology-focused, but is increasingly considering the user as well. Business is losing ground in its role as the main discourse driver, while society and politics are gaining ground.

IMPLICATIONS FOR SOCIETY AND POLICYMAKERS DEVELOPED IN THE PARTNER CONSORTIUM

Chatbots and voice assistants are already an integral part of our everyday lives today. The economic benefits, such as higher functionality or longer opening times (constant availability, 24/7), are basically also of benefit to society. However, these are not fully recognized or desired by society.

- 1. An increase in the acceptance of Al-based communication systems in society can only be achieved if the user can clearly perceive the benefits.
- 2. The implementation of the following aspects is of central importance—these should be understood as standards:
 - → Advanced and user-centered technology (is the service requested being provided?)
 - ightarrow Transparency in communication (Am I dealing with a human or a machine?)
 - → Suitability of the application area for audiovisual communication (Is it a service or personal, delicate matters)?
 - \rightarrow Algorithms should be as neutral and non-discriminatory as possible (Am I being treated fairly?)

5. Technical Control Authority

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

Prior to market launch, Al-based products and services in Germany need to be approved by a technical control authority.





THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS **EXPECT THE PROPOSITION TO BE REALIZED***





***SURVEY WAVE Basis:** German experts on the subject area "Life"; n=83 (Question 1); n = 60 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified

****SURVEY WAVE 2 Basis:** German experts; n=107; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? 2. How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top 2 (very strong + strong) 3. Which of the following sectors is currently shaping the discourse on the above-named topic area the



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	
ŤŤ	Changing human relationships	
111	Consensus in society	
0	Evaluation processes	
Ø	Regulatory parameters	

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

48 percent of the experts surveyed expect the proposition to be realized within the next ten years, while 18 percent reject it. The experts are unanimous about the positive effects, especially for business.

Over the last three years, the discussion on the topic of a "Technical Control Authority" has technology-focused, and to date, the user has had very little bearing on the discussion. In the future, the experts see it as the duty of policymakers to shape the discourse.

IMPLICATIONS FOR POLICYMAKERS DEVELOPED BY THE PARTNER CONSORTIUM

- 1. This type of additional regulation should represent society's interests and at the same time must not jeopardize business interests.
- 2. Testing authorities and guidelines in the international network should be prepared at an early stage.
- 3. Possible testing criteria for Al-based products:
 - ightarrow Upholding of the informational self-determination of the user
 - ightarrow Maintaining a required level of data quality
 - ightarrow Application of anti-bias mechanisms
 - ightarrow Evaluation following critical or non-critical application
- 4. Rather than a pure testing process, predefined frameworks and standards should guide the development of Al-based products and services.

6. Rejection of Al

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

In Germany, the increasing use of Al technologies in many areas of life has led to a large proportion of citizens perceiving them as a threat and consciously rejecting them.



THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

(Figures in percent)

TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** (Figures in percent)



52

*SURVEY WAVE Basis: German experts on the subject area "Life"; n=83 (Question 1); n = 56 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=106; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top 2 (very strong + strong) **3.** Which of the following sectors is currently shaping the discourse on the above-named topic area the

WORK

"The euphoric winners in our future working world will be Al users, as opposed to the digital deniers."

LIFE

EDUCATION

"Those who reject AI technology on principle will also have no interest in learning more about it or using it to further their knowledge."

PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	
ŤŤ	Changing human relationships	
111	Consensus in society	
0	Evaluation processes	
Ø	Regulatory parameters	

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

42 percent of the experts surveyed expect the proposition to be realized within the next ten years while 27 percent reject it.

There is, however, agreement concerning the negative impact on business and society. Over the last three years, the discussion on this topic has tended to be technology-focused.

The experts see it as the duty of society and politics in particular to shape the discourse in the future. From the experts' point of view, AI technology seems to be very academic and scientific (AI bubble) and has not yet reached the general public.

IMPLICATIONS FOR POLICYMAKERS AND SOCIETY DEVELOPED BY THE PARTNER CONSORTIUM

- 1. Policymakers have a responsibility to ensure a basic understanding of AI among the population in order to reduce rejection and barriers to use.
- Through a joint, interdisciplinary educational strategy (e.g., nationwide AI campaign similar to the Finnish national strategy for artificial intelligence), the positive aspects of digitalization and AI technology can be highlighted.
- Possible options here include media formats that explain to citizens how AI technology works in a simple and understandable way (e.g., "Wissen vor acht"* or "Sendung mit der Maus,"** the Finnish government's free online AI crash course).

* A German television program.

**A German television program for children that focuses on educational topics

53

7. Rural Living

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

In Germany, rural living has become more attractive due to the increasing use of Al systems (e.g., use of infrastructure, access to medical care).





TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION**

THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

(Figures in percent





54

*SURVEY WAVE Basis: German experts on the subject area "Life"; n=83 (Question 1); n = 68 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=106; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top 2 (very strong + strong) **3.** Which of the following sectors is currently shaping the discourse on the above-named topic area the



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	58
ŤŤ	Changing human relationships	57
111	Consensus in society	52
0	Evaluation processes	27
Ø	Regulatory parameters	43

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

45 percent of the experts surveyed expect the proposition to be realized after 2030, 37 percent expect it to be realized within the next ten years, and 13 percent reject the proposition.

The experts agree on the very positive impact on business and society. Over the last three years, the discussion on the topic of "Rural Living" has become both more technology-focused and more user-centered.

Today, the discussion on the topic tends to be of a political nature. The experts assume that this will remain the case, but view society as an equally important player. According to the experts, politicians, i.e., federal and state governments, the Bundesrat (the upper legislative body representing the sixteen Länder (federated states) of Germany at the federal level), municipalities, and political parties, are specifically called upon to address the issue.

8. Regulatory Failure

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

The regulatory control (regulation) of AI systems in Germany fails.

EXPECTED IMPACT (POSITIVE/NEGATIVE) ON BUSINESS AND SOCIETY SHOULD THE PROPOSITION BE REALIZED*



THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS **EXPECT THE PROPOSITION TO BE REALIZED***

TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION**



***SURVEY WAVE Basis:** German experts on the subject area "Life"; n=83 (Question 1); n = 43 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified

****SURVEY WAVE 2 Basis:** German experts; n=107; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? 2. How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top 2 (very strong + strong) 3. Which of the following sectors is currently shaping the discourse on the above-named topic area the

topic area the most in the future? 4. In your opinion, how has the discussion on the topic been conducted over the last 3 years?

WORK

"Does a lack of regulation harm or benefit business?"

LIFE

EDUCATION

"Awareness needs to be raised in the context of AI, i.e., educators must ensure that there is an understanding of AI so that decisions can be made."

PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	38
ŤŤ	Changing human relationships	49
-	Consensus in society	56
0	Evaluation processes	54
Ø	Regulatory parameters	62

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

36 percent of the experts surveyed expect the proposition to be realized within the next ten years, 15 percent expect it to be realized after 2030, and 27 percent reject the proposition.

Both positive and negative effects are anticipated for business while the impact on society is clearly viewed as negative.

Over the last three years, the discussion on the topic of "Regulation" has remained technology-focused, but has also become more user-centered. The experts envision politics as the future shaper of the discourse, referring specifically to the German federal government as well as the European Parliament.

9. Urban Living

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

In Germany, urban living without the use of Al systems is only possible to a limited extent and leads to substantial disadvantages (e.g., in living, orientation, navigation).





THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** **EXPECT THE PROPOSITION TO BE REALIZED*** 25 20 18 17 47 21 13 12 2020 - 20242025 - 20292030 - 2034 Later than 2035 Probably never Not specified TYPE 1 TYPE 2 TYPE 3 **TYPE 4**

58

*SURVEY WAVE Basis: German experts on the subject area "Life"; n=83 (Question 1); n = 62 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=113; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top 2 (very strong + strong) **3.** Which of the following sectors is currently shaping the discourse on the above-named topic area the



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	55
ŤŤ	Changing human relationships	63
u	Consensus in society	57
0	Evaluation processes	53
Ø	Regulatory parameters	61

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

42 percent of the experts surveyed expect the proposition to be realized after 2030, 30 percent expect it to be realized within the next ten years, and 20 percent reject the proposition

The impact on business is viewed as positive. The evaluation of the impact on society is both positive and negative.

Over the last three years, the discussion on the topic of "Urban Living" has become both more technology-focused and more user-centered. No single actor is currently shaping the discourse on this topic. Although politicians should become more involved in this discourse in the future, society plays the most important role in shaping it.

10. Al-based Criminal Investigation

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

In Germany, crimes that are detected and prevented by AI systems will be dealt with by the courts.







***SURVEY WAVE Basis:** German experts on the subject area "Life"; n=83 (Question 1); n = 52 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified

**SURVEY WAVE 2 Basis: German experts; n=107; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? 2. How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top 2 (very strong + strong) 3. Which of the following sectors is currently shaping the discourse on the above-named topic area the



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	32
ŤŤ	Changing human relationships	.46
111	Consensus in society	.57
0	Evaluation processes	.62
Ø	Regulatory parameters	66

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

44 percent of the experts surveyed expect the proposition to be realized after 2030, 31 percent expect it to be realized within the next ten years, and 20 percent reject the proposition. There is agreement, however, on the positive effects for business and society

Over the last three years, the discussion on the topic "Al-based Criminal Investigation" has remained technology-focused. According to the experts, the topic is and will remain a political issue and is currently dominated by the judicial system. Legislators must continue to deal decisively with the topic and take new realities into account (e.g., the increase in cybercrime). Society must also be encouraged to shape this discourse.

11. Intercultural Conflicts

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

Ethically, morally, or politically incompatible AI systems lead to intercultural conflicts (e.g., trade wars or restrictions on the right to travel).





THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED* (Figures in percent) TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** (Figures in percent)



62

*SURVEY WAVE Basis: German experts on the subject area "Life"; n=83 (Question 1); n = 48 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=113; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top 2 (very strong + strong) **3.** Which of the following sectors is currently shaping the discourse on the above-named topic area the



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



L *	Sense of purpose for the individual	
ŤŤ	Changing human relationships	
ш	Consensus in society	
0	Evaluation processes	
Ø	Regulatory parameters	

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

25 percent of the experts surveyed expect the proposition to be realized within the next ten years,23 percent expect it to be realized after 2030,and 31 percent reject the proposition.

There is agreement on the negative impact on business and society should the proposition be realized. Over the last three years, the discussion on this topic has remained technology-focused, but has also become more user-centered.

At present, no single actor is taking the lead in shaping the discourse. The experts believe that society and politics will have a key role to play in the future.

12. Loss of Informational Self-determination

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

Al technology has led to a situation in which the principle of informational self-determination* no longer applies in Germany.

* The basic right of the individual to exercise control over the disclosure and use of his or her personal data.

EXPECTED IMPACT (POSITIVE/NEGATIVE) ON BUSINESS AND SOCIETY SHOULD THE PROPOSITION BE REALIZED*



THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED* (Figures in percent)



TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** (Figures in percent)



64

*SURVEY WAVE Basis: German experts on the subject area "Life"; n=83 (Question 1); n = 42 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=113; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top 2 (very strong + strong) **3.** Which of the following sectors is currently shaping the discourse on the above-named topic area the



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	58
ŤŤ	Changing human relationships	68
111	Consensus in society	70
0	Evaluation processes	69
Ø	Regulatory parameters	65

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

34 percent of the experts surveyed expect the proposition to be realized within the next ten years, 17 percent expect it to be realized after 2030, and 37 percent reject the proposition.

The impact on business, which tends to be positive, is offset by a very negative impact on society. Over the last three years, the discussion on this topic has been both technology-focused and user-centered.

According to the experts, politics (especially the EU/DSGVO) is currently shaping the discourse on the topic of "Loss of Informational Selfdetermination," followed by business (here especially (Internet-) corporations). In the future, however, society and politics must shape this discourse together: Every individual is affected by this topic; however, not a single expert views business as a key shaper of this discourse.

13. Rules and Standards

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

For regulation, economic policy, and ethics, internationally recognized rules and standards govern the development, supply, and use of Al-based products and services.





LIFE

*SURVEY WAVE Basis: German experts on the subject area "Life"; n=83 (Question 1); n = 56 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=113; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top 2 (very strong + strong) **3.** Which of the following sectors is currently shaping the discourse on the above-named topic area the



"Who acts as the neutral instance that defines these rules and standards?"

LIFE

EDUCATION

"The state is always one step behind when it comes to AI and thus slows down economic development."

PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual32
ŤŤ	Changing human relationships46
ш	Consensus in society 65
0	Evaluation processes 54
Ø	Regulatory parameters

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

34 percent of the experts surveyed expect the thesis to be realized within the next ten years, 32 percent expect it to be realized after 2030, and 30 percent reject the proposition.

The experts agree on the positive impact on business and society. Over the last three years, the technically-focused discussion of this topic has become more user-centered.

In the discourse on this topic, the experts of the Future Delphi clearly see the policymakers as having a responsibility. In the future, they must address the topic more strongly. Legislation was explicitly referred to several times.

14. Use of Real-time data

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

People in Germany are not that bothered about Al-based products and services continuously utilizing all the (real-time) data available about the user (location, vital functions, mood, psyche).







68

*SURVEY WAVE Basis: German experts on the subject area "Life"; n=83 (Question 1); n = 49 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=107; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top 2 (very strong + strong) **3.** Which of the following sectors is currently shaping the discourse on the above-named topic area the



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	1
ŤŤ	Changing human relationships6	1
111	Consensus in society)
0	Evaluation processes	7
Ø	Regulatory parameters	÷

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

31 percent of the experts surveyed expect the proposition to be realized after 2030, 27 percent expect it be realized within the next ten years, and 37 percent reject the proposition.

Over the last three years, the technical discussion on the topic of "Use of Real-time Data" has become increasingly user-centered.

The topic is currently being discussed primarily in an economic context, especially by Google. The experts believe that this discourse should be shaped by society in the future, i.e., that society needs to be sensitized to the issue.

15. Loss of Data Security

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

The use of Al-based products and services in Germany has dissolved the principle of data security.

EXPECTED IMPACT (POSITIVE/NEGATIVE) ON BUSINESS AND SOCIETY SHOULD THE PROPOSITION BE REALIZED*



THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*



TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** (Figures in percent)



70

*SURVEY WAVE Basis: German experts on the subject area "Life"; n=83 (Question 1); n = 44 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=113; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top 2 (very strong + strong) **3.** Which of the following sectors is currently shaping the discourse on the above-named topic area the



"Will my employer have access to all my personal data in the future, e.g., via a data capture chip?"

LIFE

EDUCATION

"In the future, everyone will have to ask themselves which data are worth protecting for them personally."

PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	
ŤŤ	Changing human relationships	62
111	Consensus in society	. 63
0	Evaluation processes	. 66
Ø	Regulatory parameters	

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

40 percent of the experts surveyed assume that the principle of "Data Protection" will never disappear, 20 percent expect this to happen within the next ten years, and 33 percent expect it to happen later than 2030. The impact on business if the proposition is realized is viewed as positive, while the impact on society is viewed as negative.

Over the past three years, the discussion on the topic of "Data Security" has become increasingly user-centered. At present, the discourse on the topic is mainly shaped by political actors (e.g., EU Commission/DSGVO); however, according to the experts, it should also be shaped by society alongside politics in the future. Data security affects every individual. The experts would welcome, for example, an intensive examination of this topic in educational institutions.

16. "Al Nanny"

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

Al systems are an elementary part of families and, as a "virtual" family member, fully take over individual tasks of the parents ("AI Nanny").



TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION**



72

***SURVEY WAVE Basis:** German experts on the subject area "Life"; n=83 (Question 1); n = 56 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified

**SURVEY WAVE 2 Basis: German experts; n=107; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? 2. How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top 2 (very strong + strong) 3. Which of the following sectors is currently shaping the discourse on the above-named topic area the
WORK

"Freed-up time can be spent on work (and education). But do I even need more time for this? Maybe everything will slow down?"

LIFE

EDUCATION

"An Al-based approach to raising children will also find its way into educational institutions – resulting in the removal of social human structures."

PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	62
ŤŤ	Changing human relationships	70
u	Consensus in society	61
0	Evaluation processes	56
Ø	Regulatory parameters	51

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

44 percent of the experts surveyed expect the proposition to be realized after 2030, 19 percent expect it to be realized within the next ten years, and 29 percent reject the proposition.

The impact on business is viewed as positive. The assessment of the impact on society is both positive and negative.

Over the last three years, the discussion on the topic of "Al-Nanny" has remained technology-focused, but has also increasingly taken the user into account. Currently, this topic is being driven primarily by the large US Internet companies such as Amazon and Google. However, the experts are calling on society to address this issue in the future and to shape the discourse. Among others, the family itself, non-profit organizations, as well as churches were specifically referred to.

17. Loss of Privacy

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

The increasing saturation of everyday life with AI systems has led to a situation in which there is no longer any privacy, as human whims, mishaps, and lies are revealed as such by AI systems.







74 **3417**

*SURVEY WAVE Basis: German experts on the subject area "Life"; n=83 (Question 1); n = 34 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=113; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top 2 (very strong + strong) **3.** Which of the following sectors is currently shaping the discourse on the above-named topic area the

most?/Which of the following sectors should shape the discourse on the above-named topic area the most in the future? **4.** In your opinion, how has the discussion on the topic been conducted over the last 3 years?



FACTORS THAT THE EXPERTS CONSIDER TO BE OBSTACLES TO THE REALIZATION OF THE PROPOSITION



IMPLICATIONS

53 per cent of the experts surveyed assume that the proposition will probably never be realized. The main reason given by the experts is the question of technical feasibility as well as a lack of acceptance in society.

THIS PROPOSITION IS REJECTED!

18. Private Decision-making

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

In Germany, Al-based systems completely take over private decisionmaking processes without involving the user (choice of job, choice of place of residence, etc.).





***SURVEY WAVE Basis:** German experts on the subject area "Life"; n=83 (Question 1); n = 16 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified

****SURVEY WAVE 2 Basis:** German experts; n=106; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? 2. How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top 2 (very strong + strong) 3. Which of the following sectors is currently shaping the discourse on the above-named topic area the

most?/Which of the following sectors should shape the discourse on the above-named topic area the most in the future? 4. In your opinion, how has the discussion on the topic been conducted over the last 3 years?



IMPLICATIONS

76 percent of the experts interviewed assume that the proposition will probably never be realized. According to the experts, the main reason for the rejection of the proposition is the human desire for self-determination.

THIS PROPOSITION IS REJECTED!

77

LIFE

Work 2035+

A total of 19 propositions were developed in the partner consortium for the topic area Work. On the following pages, the propositions are presented in the order of their expected realization. The page opposite shows questions and statements from the partner workshop that examined the tension between life, work ,and education. (Workshop 3, December 2019)

The euphoric winners in our future working world will be Al⁻users as opposed to the digital deniers.

> Which style of leadership will assert itself in the next generation?

Freed-up time can be spent on work (and education). But do I even need more time for this? Maybe everything will slow down?

+ Who acts as the neutral instance that defines these rules and standards?

+ Does a transparent human still have a voice?

> Will my employer have access to all my personal data in the future, e.g., via a data capture chip?

Conflicts arise from misunderstandings, e.g., differing notions,

> Data is the new oil!

+ New job profiles are emerging, e.g., that of an "Al auditor."

⁺ Does a lack of regulation harm or benefit the economy?

. What is the role of the human?

. Will there be negative repercussions for a ompany if they admit to using bots in customer communication?

> Terms such as 'team' or 'creativity' need to be defined more precisely.

Family background no longer determines one's profession and career. Al guides the development of competencies in such a way that, optimally, no 'War for Talent' takes place.

Possible outcomes may include socially undesirable consumption and adapted behavior.

There will be a more oronounced formation of an elite

What will become of those deemed 'uncreative'?

> Is an increase in productivity inevitable?

Al development is limited nd Al cannot realize its full potential.

> Cross-functional work will be better possible through advanced educational training

Should a distinction be made between 'Work Al' and 'Home Al'? Is access to AI a prerequisite for acquiring and practicing certain professions?

> Innovation and creativity will no longer be attributed to humans alone.

Which other new job profiles will emerge?

How will job placement services operate? Will they still be necessary?

Will the person with the better AI system be more successful professionally?

There is a common reference framework for A applications, (similar to the Common European Framework of Reference for Languages).

1. Importance of Human Competencies

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

Companies focus on human competencies in the interaction between man and machine and continue to develop these competencies further. EXPECTED IMPACT (POSITIVE/NEGATIVE) ON BUSINESS AND SOCIETY SHOULD THE PROPOSITION BE REALIZED* (Finures in percent)



THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

(Figures in percent)





80

*SURVEY WAVE Basis: German experts on the subject area "Work"; n=323 (Question 1); n = 277 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified. ****SURVEY WAVE 2 Basis:** German experts; n=106; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	. 68
ŤŤ	Changing human relationships	
ш	Consensus in society	4/
0	Evaluation processes	
Ø	Regulatory parameters	

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

64 percent of the experts surveyed expect the proposition to be realized within the next ten years, 21 percent expect it to be realized after 2030, and 5 percent reject the proposition.

The impact on business and society is viewed as positive. Over the last three years, the discussion on the topic has been technology-focused, but is becoming increasingly user-centered. While business and technology still play a decisive role in shaping the discourse today, in the future it will be society above all that is called upon to do so. The human-Al interface is important for society as a whole: Only those who understand Al technology can work with it confidently and competently, draw benefit from it, and actively shape the discourse.

IMPLICATIONS FOR BUSINESS DEVELOPED BY THE PARTNER CONSORTIUM

- 1. Al systems used in companies must be designed in such a way that hurdles and barriers to use are as low as possible, e.g., intuitive operatability and usability.
- 2. Companies should familiarize their employees as much as possible with their internal AI systems and communicate clearly for what means and purposes they are to be used.

IMPLICATIONS FOR SOCIETY

 In the professional context, the human-AI system interface must not be viewed only from a technological and business perspective, but requires an interdisciplinary design that takes into account a wide range of human needs. For example, philosophy, pedagogy, and ethics are important disciplines that should be included in this discourse.

Q.

2. Transparency in Work Performance

In Germany, the control of work tasks through AI technologies has made humans and their work performance more transparent. EXPECTED IMPACT (POSITIVE/NEGATIVE) ON BUSINESS AND SOCIETY SHOULD THE PROPOSITION BE REALIZED*



THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*



TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION**



82

*SURVEY WAVE Basis: German experts on the subject area "Work"; n=323 (Question 1); n = 280 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified. ****SURVEY WAVE 2 Basis:** German experts; n=113; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	
ŤŤ	Changing human relationships	
111	Consensus in society	
0	Evaluation processes	78
Ø	Regulatory parameters	

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

59 percent of the experts surveyed expect the proposition to be realized within the next ten years, 27 percent expect it to be realized after 2030, and 8 percent reject the proposition.

The impact on business is viewed as positive while the projected impact on society tends towards the negative. Over the last three years, the essentially technology-focused discussion on the topic of "Transparency in Work Performance" has also become increasingly user-centered. Business is losing its relevance as a generator of discourse, while society and politics are gaining importance.

MPLICATIONS FOR SOCIETY AND POLICYMAKERS DEVELOPED BY THE PARTNER CONSORTIUM

- 1. The opportunities afforded by AI for work design and tools must be incorporated into labor law.
- 2. This will require a willingness to engage in impartial discussion and to compromise.
- **3.** Build up the basic knowledge, tools, as well as the self-confidence of the employees so that they can actively participate in the discussion.
- 4. Public discussions on best practice examples and voluntary commitments help to shape the political framework conditions.
- 5. Define the constraints within which an AI may regulate human affairs. The assessment standard must be understandable and plausible and the employee must also be able to contribute to defining it.

MPLICATIONS FOR BUSINESS DEVELOPED BY THE PARTNER CONSORTIUM

- Human resource management (in-house HR functions) driven by AI needs to be included in public discussions and regulated in line with national and international standards.
- Data security: it should be ensured that every employee always has access to and influence over the data stored about him or her (in keeping with the GDPR requirements).
- **3.** This also includes monitoring the results of an AI analysis: How binding are AI-based suggestions, specifications, and decisions? And how will this be regulated?

Ø.

3. New Companies with High Al Usage

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

In Germany, new companies are emerging in which AI technologies are integrated into all areas of day-to-day business and, in some cases, play a decisive part in steering them. EXPECTED IMPACT (POSITIVE/NEGATIVE) ON BUSINESS AND SOCIETY SHOULD THE PROPOSITION BE REALIZED* (Enurse in percent)



THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

(Figures in percent)



TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** (Figures in percent)



84

*SURVEY WAVE Basis: German experts on the subject area "Work", n=323 (Question 1); n = 280 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified. ****SURVEY WAVE 2 Basis:** German experts; n=113; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	
ŤŤ	Changing human relationships	
111	Consensus in society	
0	Evaluation processes	
Ø	Regulatory parameters	

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

52 percent of the experts surveyed expect the proposition to be realized within the next ten years, 42 percent expect it to be realized after 2030, and just 2 percent reject the proposition.

Above all, agreement reigns on the positive impact on business. Over the last three years, the discussion on the topic has been highly technology-focused. The current discourse is mainly shaped by business and industry. The experts believe that they will continue to be responsible in the future, but that politics and society should also play a role.

IMPLICATIONS FOR BUSINESS AND POLICYMAKERS DEVELOPED BY THE PARTNER CONSORTIUM

- Decisive here is the transparent operation of the algorithms and the question of where and how they should be applied and who is ultimately responsible for making decisions. It is particularly important for decision-makers to understand what Al can do better than humans, (e.g., making decisions in crises as opposed to routine situations).
- 2. Clarification is needed on the question of whether an AI system is better at making decisions that are currently only reached by exploiting power or being pretentious, or whether and to what extent it also acts unfairly. (e.g., bias with regard to gender or ethnicity in job interviews). Here, the limits for the use of AI technologies must be critically discussed and adjusted from time to time.
- **3.** Politics should take on a moderating role here and support AI practice in companies.

NORK

Q.

4. Al-based Team Composition

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

Work teams are composed ad hoc based on analyses and recommendations from Al-based platforms.





THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

(Figures in percent



TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** (Figures in percent)



86

*SURVEY WAVE Basis: German experts on the subject area "Work"; n=323 (Question 1); n = 286 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified. ****SURVEY WAVE 2 Basis:** German experts; n=106; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	60
ŤŤ	Changing human relationships	71
111	Consensus in society	50
0	Evaluation processes	73
Ø	Regulatory parameters	47

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

51 percent of the experts surveyed expect the proposition to be realized within the next ten years, 38 percent expect it to be realized after 2030, and 9 percent reject the proposition.

Above all, agreement reigns on the positive impact on business and society. Over the last three years, the discussion on the topic has been technology-focused. The potential for flexibility in Al-based platforms can be positive both for the individual and for business as a whole if business and policymakers define boundaries and constantly and wisely optimize the systems.

IMPLICATIONS FOR POLICYMAKERS DEVELOPED BY THE PARTNER CONSORTIUM

- 1. Rules of practice must be defined that ensure job placements are fair and impartial.
- There is still a need for a discussion on how qualifications particularly on cross-company platforms — can be used to build up the expertise required by the individual.

IMPLICATIONS FOR BUSINESS DEVELOPED BY THE PARTNER CONSORTIUM

- 1. Any potential ramifications for work teams and employees in the case of Al-based team composition must be considered and addressed from the outset (e.g., trust or competitive thinking).
- In order to enable a rapid and efficient method of team composition, there first needs to be a discussion between the employer and employee sides (e.g., opportunities and limitations of making employment contracts more flexible).
- **3.** Selection bias must be avoided with trained AI-based platforms. Companies must critically evaluate the use of these platforms from the onset to enable continuous optimization.

IMPLICATIONS FOR SOCIETY AND THE INDIVIDUAL DEVELOPED BY THE PARTNER CONSORTIUM

 If someone does not wish to participate on such platforms, it must be ensured that this does not result in any disadvantage for the individual. In addition, the provision of data by the individual for the purpose of team composition should be on a voluntary basis.

5. Identification of New Employment Fields

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

New fields of activity in all areas can be predicted much faster and more accurately with the help of data and enable the targeted development of competencies in the company. EXPECTED IMPACT (POSITIVE/NEGATIVE) ON BUSINESS AND SOCIETY SHOULD THE PROPOSITION BE REALIZED* (Figures in percent)



THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*





TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** (Figures in percent)



88

*SURVEY WAVE Basis: German experts on the subject area "Work"; n=323 (Question 1); n = 268 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified. ****SURVEY WAVE 2 Basis:** German experts; n=107; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual.	
ŤŤ	Changing human relationships	
111	Consensus in society	
0	Evaluation processes	66
Ø	Regulatory parameters	40

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

52 percent of the experts surveyed expect the proposition to be realized within the next ten years, 31 percent expect it to be realized after 2030, and 11 percent reject the proposition.

The impact on business and society is clearly viewed as positive. Over the last three years, the discussion on the topic has remained rather technology-focused. In addition to business, society and thus the individual will be increasingly called upon to shape the discourse in the future.

IMPLICATIONS FOR BUSINESS DEVELOPED BY THE PARTNER CONSORTIUM

- The need for "skill-based workforce management" is becoming increasingly apparent for business, i.e., specific skills and competencies of individual employees are the primary focus of work planning.
- 2. As a consequence, HR departments need to be equipped with the right technical solutions and incentives need to be found to motivate employees to disclose their competencies in as much detail as possible.

IMPLICATIONS FOR SOCIET

1. There is a chance for the individual to more easily find or pursue a profession that matches his or her intrinsic motivation and personal strengths.

Q.

6. Elimination of Industry Boundaries

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

The use of AI technologies has led to strong networking among companies and industries—in some areas, one can speak of an elimination of industry boundaries. EXPECTED IMPACT (POSITIVE/NEGATIVE) ON BUSINESS AND SOCIETY SHOULD THE PROPOSITION BE REALIZED* (Figures in percent)



THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*





TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** (Figures in percent)



90

****SURVEY WAVE 2 Basis:** German experts; n=113; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	.24
ŤŤ	Changing human relationships	33
111	Consensus in society	39
0	Evaluation processes	.43
Ø	Regulatory parameters	53

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

51 percent of the experts surveyed expect the proposition to be realized within the next ten years, 34 percent expect it to be realized after 2030, and 10 percent reject the proposition.

Above all, agreement reigns on the positive impact for business and society. Over the past three years, the discussion on the topic has been essentially technology-focused. Business is currently shaping the discourse. The experts believe that they will continue to assume responsibility in the future, although politicians should also become more involved in the debate.

IMPLICATIONS FOR BUSINESS AND POLICYMAKERS DEVELOPED BY THE PARTNER CONSORTIUM

- 1. The trend towards the dissolution of industry boundaries, which can already be observed today, will progress even faster as a result of the use of AI technologies.
- 2. It will be necessary to rely more on an open source/open data approach (i.e., the general availability of data as well).
- **3.** In addition, the personnel must undergo continuous training in order to be able to assess and classify these developments.

NORK

Q.

7. War for Talent

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

Cognitively-demanding and creative job profiles dominate the labor market, and there is unprecedented competition for talent.



THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

(Figures in percent



TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION**



WORK

92

*SURVEY WAVE Basis: German experts on the subject area "Work"; n=323 (Question 1); n = 260 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified. ****SURVEY WAVE 2 Basis:** German experts; n=106; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)

3. Which of the following sectors is currently shaping the discourse on the above-named topic area the most?/Which of the following sectors should shape the discourse on the above-named topic area the most in the future? 4. In your opinion, how has the discussion on the topic been conducted over the last 3 years?

(3)

TYPE 4



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	69
ŤŤ	Changing human relationships	62
ш	Consensus in society	60
0	Evaluation processes	67
Ø	Regulatory parameters	42

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

53 percent of the experts surveyed expect the proposition to be realized within the next ten years, 28 percent expect it to be realized after 2030, and 15 percent reject the proposition.

The impact on business and society tends to be viewed as negative. Over the last three years, the discussion on the topic has become increasingly user-centered. While business is still the most important actor in shaping the discourse today, greater involvement from society and politics is desired in the future. Educational organizations play a special role here.

IMPLICATIONS FOR POLICYMAKERS AND SOCIETY DEVELOPED BY THE PARTNER CONSORTIUM

1. Policymakers should work to reduce the inequality of qualifications and, in turn, of income by consistently and systematically promoting further training.

IMPLICATIONS FOR BUSINESS DEVELOPED BY THE PARTNER CONSORTIUM

- High investments (personnel costs) can be expected for business, especially if it is not possible to find enough skilled workers. The only countermeasure is the consistent and permanent training and further education of the company's own employees.
- 2. The scenario is both a great opportunity and a great risk. A restructuring of the business sector toward higher-skilled jobs (combined with more self-organization and initiative) is attractive for Germany as a business location, but it may be difficult to implement.
- **3.** Given the expected change in job profiles, both qualification types and occupational profiles are also adapting, and at a much faster pace than before.

NORK

8. Greater Trust in Al

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

People have greater trust in Al-assisted analysis results than in those provided by human colleagues.





THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

(Figures in percent





94

*SURVEY WAVE Basis: German experts on the subject area "Work"; n=323 (Question 1); n = 265 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified. ****SURVEY WAVE 2 Basis:** German experts; n=113; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	
ŤŤ	Changing human relationships	75
111	Consensus in society	
0	Evaluation processes	
Ø	Regulatory parameters	

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

44 percent of the experts surveyed expect the proposition to be realized after 2030, 38 percent expect it to be realized within the next ten years, and 11 percent reject the proposition.

The majority of those surveyed view the impact on business as positive while views of the impact on society are polarized. Over the last three years, the discussion on this topic has remained technology-focused.

The discourse is currently being driven primarily by academia, but also by business (especially the large Internet corporations) and society. The experts would like to see much more participation on the part of society and politics.

9. Administrative Leadership Tasks

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

Al technologies take over a large share of the administrative leadership tasks (e.g., task planning, meeting targets, controlling).





THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

(Figures in percent



TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** (Figures in percent)



96

*SURVEY WAVE Basis: German experts on the subject area "Work"; n=323 (Question 1); n = 266 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified. ****SURVEY WAVE 2 Basis:** German experts; n=113; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	
ŤŤ	Changing human relationships	
111	Consensus in society	
0	Evaluation processes	78
Ø	Regulatory parameters	

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

50 percent of the experts surveyed expect the proposition to be realized after 2030, 31 percent expect it to be realized within the next ten years, and 15 percent reject the proposition.

The impact on business is viewed as positive while the impact on society is viewed as both positive and negative. Over the last three years, the discussion on the topic has been technology-focused. Today, it is mainly business that is shaping the discussion (particularly large internet corporations); in the future, however, society (every individual citizen) and politics should get involved.

Q.

10. New Job Profiles

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

Job profiles that are problem- and task-oriented (e.g., motivator, socializer, expert on a specific topic) dominate the working world in Germany.

25

2030 - 2034

21

Later than 2035





THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS **EXPECT THE PROPOSITION TO BE REALIZED***

16

2025 - 2029

7

2020 - 2024





98

*SURVEY WAVE Basis: German experts on the subject area "Work"; n=323 (Question 1); n = 221 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified.

****SURVEY WAVE 2 Basis:** German experts; n=106; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)

topic area the most?/Which of the following sectors should shape the discourse on the above-named topic area the most in the future? 4. In your opinion, how has the discussion on the topic been conducted over the last 3 years?

(5)



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1.	Sense of purpose for the individual	75
ŤŤ	Changing human relationships	70
111	Consensus in society	5'
0	Evaluation processes	
Ø	Regulatory parameters	

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

46 percent of the experts surveyed expect the proposition to be realized after 2030, 23 percent expect it to be realized within the next ten years, while a further 23 percent reject the proposition.

The majority view the impact on business and society as positive. Over the last three years, the discussion on the topic has remained technology-focused. According to the experts, the current discourse is primarily shaped by business; in the future, business and society should drive the topic forward together. Educational institutions should also play a key role here.

WORK

Q.

11. No Work without AI

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

In the vast majority of work situations, humans are no longer capable of working without the application of AI systems.





THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** **EXPECT THE PROPOSITION TO BE REALIZED*** 33 32 15 42 15 12 20 12 3 2 2020 - 20242025 - 20292030 - 2034 Later than 2035 Probably never Not specified TYPE 1 **TYPE 2** TYPE 3 **TYPE 4**

100

*SURVEY WAVE Basis: German experts on the subject area "Work"; n=323 (Question 1); n = 266 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified. ****SURVEY WAVE 2 Basis:** German experts; n=107; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)

EDUCATION

"Are there people who are more intelligent than AI and can therefore still make judgements about the technology?"

WORK

LIFE

"We have to decide where we should use AI and where we should consciously refrain from doing so."

PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	64
ŤŤ	Changing human relationships	. 55
111	Consensus in society	64
0	Evaluation processes	71
Ø	Regulatory parameters	. 61

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

65 percent of the experts surveyed expect the proposition to be realized after 2030, 17 percent expect it to be realized within the next ten years, and 15 percent reject the proposition.

The impact on business tends to be viewed as positive while the impact on society tends to be viewed as negative.

Over the last three years, the discussion on the topic of "No Work without Al" has remained technology-focused, though it has also become more user-centered.

According to one third of the experts, the discourse is currently shaped by business. In the future, society in particular is seen as the responsible driver, and a broad discussion should take place throughout society.

12. HR Development through AI

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

Al technologies take over parts of HR development in companies on their own, without any human input.





THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS **EXPECT THE PROPOSITION TO BE REALIZED***



TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION**



*SURVEY WAVE Basis: German experts on the subject area "Work"; n=323 (Question 1); n = 219 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified.

****SURVEY WAVE 2 Basis:** German experts; n=107; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)

topic area the most?/Which of the following sectors should shape the discourse on the above-named topic area the most in the future? 4. In your opinion, how has the discussion on the topic been conducted over the last 3 years?



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	51
ŤŤ	Changing human relationships	62
111	Consensus in society	57
0	Evaluation processes	70
Ø	Regulatory parameters	51

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

40 percent of the experts surveyed expect the proposition to be realized after 2030, 28 percent expect it to be realized within the next ten years, and 31 percent reject the proposition.

The majority view the impact on business as positive; the impact on society, on the other hand, is viewed as negative. Over the last three years, the discussion on the topic of "HR Development through Al" has remained technology-focused.

According to the experts, the discourse on this topic is currently mainly driven by business, but in the future, it should be increasingly shaped by society—in cooperation with the business community, where trade unions, for example, should also play a stronger role.

13. Al Intervention from Birth onwards

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

In Germany, highly personalizable, Al-based systems accompany their users from birth, evolve with them, and support interest- and aptitude-oriented lifelong learning.

25

2030 - 2034

Later than 2035

EXPECTED IMPACT (POSITIVE/NEGATIVE) ON BUSINESS AND SOCIETY SHOULD THE PROPOSITION BE REALIZED*



THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** 43

(7)

TYPE 1



EXPECT THE PROPOSITION TO BE REALIZED*

104

WORK

*SURVEY WAVE Basis: German experts on the subject area "Work"; n=323 (Question 1); n = 281 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified.

**SURVEY WAVE 2 Basis: German experts; n=107; figures in percent; percent missing up to 100=not specified.

Not specified

q

Probably never

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)

topic area the most?/Which of the following sectors should shape the discourse on the above-named topic area the most in the future? 4. In your opinion, how has the discussion on the topic been conducted over the last 3 years?

48

TYPE 3

15

TYPE 4

18

TYPE 2



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	70
ŤŤ	Changing human relationships	72
111	Consensus in society	. 68
0	Evaluation processes	72
Ø	Regulatory parameters	. 56

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

68 percent of the experts surveyed expect the proposition to be realized after 2030, 19 percent expect it to be realized within the next ten years, and 9 percent reject the proposition.

According to the experts, the impact on business and on society will be positive. Over the last three years, the discussion on the topic of "Al Intervention from Birth Onwards" has remained technology-focused.

Today, it is more business and academia that are shaping the discourse as well as educational institutions and trade unions/employer's associations. In the future, society should work together with the education system to shape this discourse.

WORK

14. A New Understanding of Management

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

Since Al technologies are responsible for much of the decision-making in companies, management is mainly responsible for HR management, motivation, and creative output.

25

2030 - 2034

EXPECTED IMPACT (POSITIVE/NEGATIVE) ON BUSINESS AND SOCIETY SHOULD THE PROPOSITION BE REALIZED* (Figures in percent)



THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

20

2025 - 2029

(Figures in percent)

5

2020 - 2024





*SURVEY WAVE Basis: German experts on the subject area "Work"; n=323 (Question 1); n = 234 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified. ****SURVEY WAVE 2 Basis:** German experts; n=106; figures in percent; percent missing up to 100=not specified.

٦

Not specified

24

Probably never

23

Later than 2035

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	72
ŤŤ	Changing human relationships	75
	Consensus in society	64
0	Evaluation processes	82
Ø	Regulatory parameters	60

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

47 percent of the experts surveyed expect the proposition to be realized after 2030, 25 percent expect it to be realized within the next ten years, and 24 percent reject the proposition. The impact on business and society is viewed as generally positive.

Over the last three years, the discussion on the topic of "A New Understanding of Management" has remained technology-focused. At present, it is particularly business that is driving this issue, and the experts believe this should remain the case; however, society should also play a role in shaping the discourse.

WORK

15. More Freelance Activities

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

In Germany, people mainly work as freelancers with a high degree of flexibility in terms of the choice of work content and companies, and there is hardly any long-term employment anymore.

19

2030 - 2034

27

Later than 2035





TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION**

THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

(Figures in percent)

3

2020 - 2024





108

*SURVEY WAVE Basis: German experts on the subject area "Work"; n=323 (Question 1); n = 189 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified.

10

2025 - 2029

****SURVEY WAVE 2 Basis:** German experts; n=106; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)

3. Which of the following sectors is currently shaping the discourse on the above-named topic area the most?/Which of the following sectors should shape the discourse on the above-named topic area the most in the future? 4. In your opinion, how has the discussion on the topic been conducted over the last 3 years?

(8)

TYPE 4


PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	
ŤŤ	Changing human relationships	
ш	Consensus in society	64
0	Evaluation processes	63
Ø	Regulatory parameters	60

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

37 percent of the experts surveyed assume that the proposition will probably never be realized, 27 percent believe that it will at least be realized later than 2035, and 13 percent expect it to be realized realized within the next few years.

Slightly more than half the experts view the impact on business as positive and the impact on society as negative.

Over the last three years, the discussion on the topic of "Freelancing" has remained technology-focused, but has also become more user-centered.

At the moment, the discourse is mainly shaped by business; in the future, according to the experts, this should be carried out by society, business, and politics.

Q.

16. A Halving of the Working Week

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

Compared to today, the regular working week (gainful employment) in Germany has halved due to the use of Al technologies.





TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS **EXPECT THE PROPOSITION TO BE REALIZED*** 41 33 18 (8)19 14 5 0 2020 - 20242025 - 20292030 - 2034Later than 2035 Probably never Not specified TYPE 1 **TYPE 2** TYPE 3 **TYPE 4**

*SURVEY WAVE Basis: German experts on the subject area "Work"; n=323 (Question 1); n = 174 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified. ****SURVEY WAVE 2 Basis:** German experts; n=106; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	74
ŤŤ	Changing human relationships	75
ш	Consensus in society	68
0	Evaluation processes	60
Ø	Regulatory parameters	63

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

51 percent of the experts surveyed expect the proposition to be realized after 2030, 4 percent expect it to be realized within the next ten years, and 41 percent reject the proposition.

The impact on business and society are viewed as positive. Over the last three years, the discussion on the topic of "Hours in a Working Week" has remained technology-focused.

The current discourse is shaped by business, politics, and, to a lesser extent, society (particular mention is frequently made of the trade unions); in the future, the experts would like to see much greater involvement on the part of society as well as cooperation between the various actors.

17. No Distinction made between Humans and Al

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS

In companies, a distinction is no longer made between humans and AI technologies (e.g., in team projects, team composition, responsibility). EXPECTED IMPACT (POSITIVE/NEGATIVE) ON BUSINESS AND SOCIETY SHOULD THE PROPOSITION BE REALIZED* (Figures in percent)



TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** (Figures in percent)



112

*SURVEY WAVE Basis: German experts on the subject area "Work"; n=323 (Question 1); n = 135 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified. ****SURVEY WAVE 2 Basis:** German experts; n=113; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)



FACTORS THAT THE EXPERTS CONSIDER TO BE OBSTACLES TO THE REALIZATION OF THE PROPOSITION



IMPLICATIONS

53 percent of the experts surveyed assume that the proposition will probably never be realized. According to the experts, the main reason behind the rejection of the proposition is technical feasibility as well as a lack of acceptance of such a reality.



WORK

18. Al-based Entrepreneurship

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

Al technologies set up and run their own companies in Germany.







*SURVEY WAVE Basis: German experts on the subject area "Work"; n=323 (Question 1); n = 119 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified. ****SURVEY WAVE 2 Basis:** German experts; n=106; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)





FACTORS THAT THE EXPERTS CONSIDER TO BE OBSTACLES TO THE REALIZATION OF THE PROPOSITION



IMPLICATIONS

57 percent of the experts surveyed assume that the proposition will probably never be realized. From the experts' perspective, the lack of technical feasibility as well as a general fear of loss of control stands in the way of the realization of the proposition.

THE PROPOSITION IS REJECTED!

WORK

19. Interpersonal Activities

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

Al systems have largely taken over interpersonal activities such as counselling or psychological support.





WORK

*SURVEY WAVE Basis: German experts on the subject area "Work"; n=323 (Question 1); n = 130 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified. ****SURVEY WAVE 2 Basis:** German experts; n=106; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)





FACTORS THAT THE EXPERTS CONSIDER TO BE OBSTACLES TO THE REALIZATION OF THE PROPOSITION



IMPLICATIONS

57 percent of the experts surveyed assume that the proposition will probably never be realized. From the experts' perspective, the questionable technical feasibility stands in the way of the realization of the proposition.



WORK

Education 2035+

The didactics and methods of learning are changing.

Education will take place more virtually; physical presence will decrease.

Who is being taught: the human or its Al system?

Those who rely on AI systems alone become susceptible to manipulation and are no longer capable of trusting their own or others' opinions.

Will a 'globally compliant' Al education prevail?

Can an Al system replace the human teacher? What is the future role of the teacher?

Who makes decisions about learning content that is compulsory for everyone?

How will future managers be trained and what role they will play?

Will curricula and lesson plans be generated by Al systems?

Customized and individual educational programs will be possible.

Awareness needs to be raised in the context of Al.

An Al-based approach to raising children will also find its way into educational institutions-resulting in the removal of sócial human structures.

It is becoming increasingly important to be able to evaluate and use AI systems, e.g., obtain an Al Operator's Licénce.

1. Al Architect

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

The Al architect (comparable to the software architect) is a recognized profession in Germany.





THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

(Figures in percent)





*SURVEY WAVE 1 Basis: German experts on the subject area "Education"; n=62 (Question 1); n = 59 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=107; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	34
ŤŤ	Changing human relationships	16
TTT	Consensus in society	21
0	Evaluation processes	32
Ø	Regulatory parameters	26

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

69 percent of the experts surveyed expect the proposition to be realized within the next ten years. 26 percent expect it to be realized after 2030, and only 3 percent reject the proposition.

The impact on business and society is viewed as positive. The discussion on the topic is technology-focused. Today, the discourse is primarily shaped by business and academia, and they should continue to advance the topic in the future—universities in particular will have an important role to play here.

IMPLICATIONS FOR BUSINESS DEVELOPED BY THE PARTNER CONSORTIUM

- 1. This example of a new job profile/job title is attractive for the job market.
- 2. Due to the high momentum of the development in the area of digitalization and especially artificial intelligence, it is important that the training here is always up to date and is also adapted in shorter intervals.
- 3. In general, however, the concept of profession should be discussed critically in the future, as job profiles and activities may become more important than job descriptions and professions.

2. War for Talent

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS

EXPECT THE PROPOSITION TO BE REALIZED*

Given that people only take on cognitively demanding and creative jobs in a working world permeated by Al systems, the war for "creative talent" in Germany has intensified drastically.





TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** (Figures in percent)



*SURVEY WAVE 1 Basis: German experts on the subject area "Education"; n=62 (Question 1); n = 54 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=107; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	.64
ŤŤ	Changing human relationships	57
111	Consensus in society	60
0	Evaluation processes	66
Ø	Regulatory parameters	36

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

The war for creative talent will be evident by the end of the decade: 62 percent of the experts surveyed expect the proposition to be realized within the next ten years, 24 percent expect it to be realized after 2030, and 10 percent reject the proposition.

The impact on society and business is viewed as rather negative. Over the last three years, the discussion on the topic of "War for talent," which has been marked by its focus on technology, has become more user-centered. Whereas today business still plays a role in shaping the discourse, experts believe that a cross-sectoral dialog should take place in the future.

IMPLICATIONS FOR BUSINESS DEVELOPED BY THE PARTNER CONSORTIUM

- 1. Al should be further developed in the direction of these scarce resources: cognitively demanding and creative! Harness the potential of teams and crowds.
- 2. Communication with the client (e.g., co-creation) should be further developed in such a way that AI can be applied, but does not solely dictate what happens.
- 3. With respect to the public image of companies: Social value-based and sustainable entrepreneurship will become even more important.

IMPLICATIONS FOR SOCIETY AND THE INDIVIDUAL DEVELOPED BY THE PARTNER CONSORTIUM

- 1. Plurality can be achieved through the targeted promotion of creativity
- Show appreciation and acceptance towards people who are not "creative talents" in order to counteract division. (Qualities such as empathy, reliability, and adaptability are especially important)

IMPLICATIONS FOR POLICYMAKERS (EDUCATIONAL INSTITUTIONS) DEVEL-OPED BY THE PARTNER CONSORTIUM

- 1. To counteract division, the discussion on aspects of trust, such as ethics, integrity, openness, accountability, competence, consistency, should continue.
- 2. Existing regulations should be examined to ensure that they do not systematically discriminate against lateral thinking and newcomers (training courses, funding, specialist careers, etc.).
- 3. Al technologies should particularly be used for the democratization of knowledge and information for the common good.
- 4. Society should push for AI technologies to be used to enable more individualized, person-centered education, which includes education about AI itself.

3. Impact on Human Capabilities

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS

EXPECT THE PROPOSITION TO BE REALIZED*

Human capabilities (e.g., memory) and skills (e.g., mental arithmetic abilities) have noticeably changed through the constant use of AI technologies.







124

*SURVEY WAVE 1 Basis: German experts on the subject area "Education"; n=62 (Question 1); n = 49 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=107; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



Ľ	Sense of purpose for the individual 5	3
ŤŤ	Changing human relationships	41
111	Consensus in society	+3
0	Evaluation processes 5	5
Ø	Regulatory parameters	27

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

52 percent of the experts surveyed expect the proposition to be realized within the next ten years, 28 percent expect it be realized after 2030, and 18 percent reject the proposition.

The impact on business and society is viewed as rather negative. Over the last three years, the discussion on the topic of "Human Capabilities" has remained rather technology-focused. Society in particular will play a significant role in shaping the discourse in the future.

IMPLICATIONS FOR SOCIETY DEVELOPED BY THE PARTNER CONSORTIUM

- Society and individuals (especially schools) need to be prepared to face a challenge: Basic cultural skills (such as reading or writing) and basic technological skills (for engaging with leading technologies) need to be merged.
- Al technologies can result in a loss of competencies in adults (e.g., mental arithmetic); however, these competencies can be fundamentally important for a person's intellectual development.
- **3.** This means that competencies of the future must also be viewed from a developmental perspective, i.e., the findings of developmental psychology always need to taken into account as well.

4

4. Social Division

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

In Germany, the different levels of education have different access to Al technologies, which has resulted in social division.



THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

(Figures in percent





126

*SURVEY WAVE 1 Basis: German experts on the subject area "Education"; n=62 (Question 1); n = 56 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=113; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	64
ŤŤ	Changing human relationships	74
ш	Consensus in society	73
0	Evaluation processes	63
Ø	Regulatory parameters	

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

42 percent of the experts surveyed expect the proposition to be realized within the next ten years, 29 percent expect it to be realized after 2030, and 19 percent reject the proposition.

Above all, the impact on society is viewed as extremely negative. Over the last three years, the discussion on the topic of "Social Division" has become more user-centered. Since the realization of this proposition would lead to clear negative effects, consistent educational efforts across all disciplines will be needed in the future, as well as systematic support of AI projects from which as many areas of society as possible can benefit.

IMPLICATIONS FOR POLICYMAKERS (PUBLIC EDUCATIONAL INSTITUTIONS)
DEVELOPED BY THE PARTNER CONSORTIUM

- 1. Policymakers must first understand the technical and user-related discourse on AI technologies in in all dimensions.
- 2. The building up of broad Al competence across all sectors of society must be pursued as a top priority.
- 3. A regulatory framework should ensure that AI technologies are generally accessible as a common good for society as a whole.
- 4. Policymakers should promote large-scale AI projects in order to foster the "common good."

IMPLICATIONS FOR BUSINESS DEVELOPED BY THE PARTNER CONSORTIUM

 Business, represented by associations and interest groups, should agree on principles for the use and dissemination of AI technologies for the benefit of as many people as possible.

IMPLICATIONS FOR SOCIETY AND THE INDIVIDUAL DEVELOPED BY THE PARTNER CONSORTIUM

- 1. Al technologies should find their way into all parts of society through the comprehensive transfer of knowledge and applications into schools, colleges, universities, and all other educational institutions.
- 2. Al should be used to democratize access to and use of knowledge and information for the benefit of everyone.
- 3. Society should push for AI technologies to be used to enable more individualized, personalized education, including education on AI itself.



5. More Advanced Educational Training

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

In Germany, the extensive use of Al technologies has led to more advanced educational training to help people understand the complex systemic interrelationships (both technical and human). EXPECTED IMPACT (POSITIVE/NEGATIVE) ON BUSINESS AND SOCIETY SHOULD THE PROPOSITION BE REALIZED* (Finures in percent)



THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

(Figures in percent)



TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** (Figures in percent)



128

*SURVEY WAVE 1 Basis: German experts on the subject area "Education"; n=62 (Question 1); n = 53 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=106; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)

WORK

"Cross-functional work will be better possible through such advanced educational training."

EDUCATION

LIFE

"Democratic processes will be better understood by the public"

PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	52
ŤŤ	Changing human relationships	.43
111	Consensus in society	.43
0	Evaluation processes	53
Ø	Regulatory parameters	.42

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

43 percent of the experts surveyed expect the proposition to be realized after 2030, 41 percent expect it to be realized within the next ten years, and 11 percent reject the proposition.

The expected impact on society and business is viewed as very positive in each case. While the discussion on the topic over the last three years has been very much technology-focused, it has increasingly taken the user into account. Today, the discourse on the topic is shaped by actors from the business sector; according to the experts, society in particular should become more involved in the discourse in the future.

6. Continuous Adaptation

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

A predictive AI technology teaches "its" user to continuously and individually adapt to changes (new behaviors, new technologies).



THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*





130

*SURVEY WAVE 1 Basis: German experts on the subject area "Education"; n=62 (Question 1); n = 55 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=107; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)

WORK

"Al guides the development of competencies in such a way that, optimally, no 'War for Talent' takes place."

EDUCATION

LIFE

"The influence of parents on children will change."

PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	61
ŤŤ	Changing human relationships	58
111	Consensus in society	56
0	Evaluation processes	69
Ø	Regulatory parameters	49

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS

(Main findings of the expert survey)

52 percent of the experts surveyed expect the proposition to be realized after 2030, 37 percent expect it to be realized within the next ten years, and 10 percent reject the proposition.

The impact on society and business is viewed as clearly positive. Over the last three years, the discussion on the topic has remained technology-focused. With this proposition, too, the experts envision society as the main driving force behind the discourse on this topic in the future.

7. Social Status Defined by Al Access

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

In Germany, social status and thus access to education is determined by the possession and use of Al systems.





 THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS
 TYPE OF AI-TECH

 EXPECT THE PROPOSITION TO BE REALIZED*
 (Figures in percent)

TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** (Figures in percent)



132

*SURVEY WAVE 1 Basis: German experts on the subject area "Education"; n=62 (Question 1); n = 43 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=113; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual6	7
ŤŤ	Changing human relationships7	4
111	Consensus in society	2
0	Evaluation processes	5
Ø	Regulatory parameters	5

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

35 percent of the experts surveyed expect the proposition to be realized within the next ten years, a further 35 percent expect it to be realized after 2030, and 24 percent reject the proposition.

Whereas the impact on business tends to viewed as positive, the reverse is true for society. Over the last three years, the discussion on the topic of "Social Status Defined by Al Access" has tended to remain technology-focused.

Experts view society as primarily responsible for shaping the discourse on this topic in the future; politics is seen as a secondary protagonist.

8. Al-based Education within Families

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

In Germany, AI technologies have taken over a large share of learning within the family (knowledge transfer, tutoring...) for children and young people. EXPECTED IMPACT (POSITIVE/NEGATIVE) ON BUSINESS AND SOCIETY SHOULD THE PROPOSITION BE REALIZED* (Figures in percent)



THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*



TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** (Figures in percent)



*SURVEY WAVE 1 Basis: German experts on the subject area "Education"; n=62 (Question 1); n = 50 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=113; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	66
ŤŤ	Changing human relationships	.72
111	Consensus in society	. 51
0	Evaluation processes	.64
Ø	Regulatory parameters	44

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

58 percent of the experts surveyed expect the proposition to be realized after 2030, 26 percent expect it to be realized within the next ten years, and 16 percent reject the proposition.

The impact on business is viewed as purely positive, whereas respondents are divided about the impact on society.

Over the last three years, the discussion on the topic of "Al-based Education within Families" has remained technology-focused, but has also become more user-centered.

The experts call for the discourse on the proposition to be primarily a public discussion. In particular, educational institutions, such as the Ministry of Education, as well as universities, should shape this discourse.

9. Family-own AI Systems

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

In Germany, family-own AI systems are the standard virtual source of advice for everyday worries and questions for all members of the family. ("AI has a place at the table").

21

2030 - 2034

24

Later than 2035





TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** (Figures in percent)



136

*SURVEY WAVE 1 Basis: German experts on the subject area "Education"; n=62 (Question 1); n = 49 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=113; figures in percent; percent missing up to 100=not specified.

Not specified

18

Probably never

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)

3. Which of the following sectors is currently shaping the discourse on the above-named topic area the most?/Which of the following sectors should shape the discourse on the above-named topic area the most in the future? 4. In your opinion, how has the discussion on the topic been conducted over the last 3 years?

THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

27

2025 - 2029

6

2020 - 2024



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1.	Sense of purpose for the individual	65
ŤŤ	Changing human relationships	.75
111	Consensus in society	
0	Evaluation processes	
Ø	Regulatory parameters	47

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

45 percent of the experts surveyed expect the proposition to be realized after 2030, 33 percent expect it to be realized within the next ten years, and 18 percent reject the proposition.

The respondents expect the realization of the proposition to have an almost exclusively positive impact on business, but view the implications for society as being equally negative and positive.

Over the last three years, the discussion on the topic of "Family-own AI systems" has become more user-centered.

In the future, the experts see society (e.g., social institutions as well as the family itself) as being primarily responsible for steering the development through an appropriate discussion.

10. Lifelong learning through AI

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

Personal Al systems accompany their user from birth onwards, enabling a new kind of lifelong learning.





THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

(Figures in percent)



TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** (Figures in percent)



138

*SURVEY WAVE 1 Basis: German experts on the subject area "Education"; n=62 (Question 1); n = 57 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=106; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)

WORK

"How does accessible education work in practice?"

EDUCATION

LIFE

"What other tasks does a personal system assume? Recommendations on where to live? Choosing a partner, etc.?"

PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual \dots 74
ŤŤ	Changing human relationships
ш	Consensus in society
0	Evaluation processes
Ø	Regulatory parameters

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

71 percent of the experts surveyed expect the proposition to be realized after 2030, 21 percent expect it to be realized within the next ten years, and 6 percent reject the proposition.

The expected impact on society and business is viewed as very positive in each case. Over the last three years, the discussion on the topic of "Lifelong Learning through AI" has been essentially technologyfocused, but has also increasingly taken the user into account.

What is striking about this proposition is the clear shift in the focus of the discussion away from academia towards society, from which it can be deduced that, in the long term, the realization of the proposition no longer represents a technical question, but rather a social discourse is required. The educational institutions are responsible for shaping the discussion on the topic of "lifelong learning."

11. Basic Al Qualifications for Employees

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

Every employee in Germany has basic Al qualifications.





THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS EXPECT THE PROPOSITION TO BE REALIZED*

(Figures in percent)





140

*SURVEY WAVE 1 Basis: German experts on the subject area "Education"; n=62 (Question 1); n = 49 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=106; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)

WORK

"There is a common reference framework for AI applications, (similar to the Common European Framework of Reference for Languages)."

EDUCATION

LIFE

"Is a fulfilling private life only going to be possible if it includes AI?"

PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	4 9
ŤŤ	Changing human relationships	39
111	Consensus in society	42
0	Evaluation processes	53
Ø	Regulatory parameters	42

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

58 percent of the experts surveyed expect the proposition to be realized after 2030, 21 percent expect it to be realized within the next ten years, and 19 percent reject the proposition.

The impact on business and society is viewed as clearly positive.

Over the last three years, the discussion on the topic of "Basic Al Qualifications for Employees" has remained technology-focused.

According to the experts, business and society share the main responsibility for shaping the discourse on this topic in the future (particularly educational institutions); politics and academia, on the other hand, are seen as secondary protagonists.

12. Basic Al Competence for All

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS

19

2025 - 2029

EXPECT THE PROPOSITION TO BE REALIZED*

6

2020 - 2024

Every person in Germany has a basic Al competence (i.e., they know that Al technologies are available, what they can do, where they are used, etc.) and can use them in all areas of life.

26

2030 - 2034

26

Later than 2035



81 6

77 6





z

142

*SURVEY WAVE 1 Basis: German experts on the subject area "Education"; n=62 (Question 1); n = 48 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=106; figures in percent; percent missing up to 100=not specified.

Ω

Not specified

23

Probably never

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	42
ŤŤ	Changing human relationships	41
111	Consensus in society	
0	Evaluation processes	
Ø	Regulatory parameters	46

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

52 percent of the experts surveyed expect the proposition to be realized after 2030, 25 percent expect it to be realized within the next ten years, and 23 percent reject the proposition.

The impact on business and society is viewed as clearly positive. Over the last three years, the discussion on the topic of "Basic Al Competence for All" has been technology-focused.

The discourse required for the topic is primarily attributed to politics and society (particularly educational institutions); business and academia, on the other hand, are considered to play a lesser role.

13. State Control of Al

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

In Germany, the use of AI technology is monitored/defined by a new state authority (e.g., the AI Ministry).







*SURVEY WAVE 1 Basis: German experts on the subject area "Education"; n=62 (Question 1); n = 39 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither

positive nor negative or not specified

****SURVEY WAVE 2 Basis:** German experts; n=113; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)
PARTNER WORKSHOP ON THE TENSION BETWEEN



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	25
ŤŤ	Changing human relationships	33
ш	Consensus in society	66
0	Evaluation processes	53
Ø	Regulatory parameters	82

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

The experts generally expect that the proposition will be realized at a later date: Only 15 percent of the experts surveyed expect the proposition to be realized within the next ten years, 48 percent expect it to be realized after 2030, and 26 percent reject the proposition.

With regard to the impact on business, the experts see both negative and positive effects. The impact on society is viewed as clearly positive.

Over the last three years, the discussion on the topic of "State Control of Al" has remained technology-focused. In the future, the experts see it as the duty of politicians to shape the discourse. At present, there is still no defined government body that controls the use of Al technologies. Instead, many political and business entities act at different levels regarding the topic of digitalization as well as the topic of Al.

MPLICATIONS FOR POLICYMAKERS DEVELOPED IN THE PARTNER CONSORTIUM

- 1. Policymakers should clearly define the issues that need to be addressed in the context of 'deployment and control of AI.'
- 2. This requires a dedicated discussion of the topic of AI on all political levels and the adoption of different perspectives: Cooperation between politicians who take the societal perspective (e.g., use of audiovisual systems) and experts who take a specialist perspective (e.g., within the framework of an AI-Audit).
- 3. Regulation of Al should be implemented at different levels (regional and international) in order to comply with the respective ethical principles and laws.

₽.

14. Mutual Training of Humans and Al

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

In Germany, the individual and his or her Al system educate each other in a symbiotic relationship.





TYPE OF AI-TECHNOLOGY REQUIRED TO ENABLE THIS REALIZATION** THE EARLIEST POINT IN TIME AT WHICH GERMAN EXPERTS **EXPECT THE PROPOSITION TO BE REALIZED*** 31 26 24 (6)16 10 5 2020 - 20242025 - 20292030 - 2034 Later than 2035 Probably never Not specified

*SURVEY WAVE 1 Basis: German experts on the subject area "Education"; n=62 (Question 1); n = 43 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither positive nor negative or not specified ****SURVEY WAVE 2 Basis:** German experts; n=106; figures in percent; percent missing up to 100=not specified.

TYPE 1

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)

3. Which of the following sectors is currently shaping the discourse on the above-named topic area the most?/Which of the following sectors should shape the discourse on the above-named topic area the most in the future? 4. In your opinion, how has the discussion on the topic been conducted over the last 3 years?

TYPE 3

TYPE 4

TYPE 2

PARTNER WORKSHOP ON THE TENSION BETWEEN

WORK

"Will the person with the better Al system be more successful professionally?"

EDUCATION

LIFE

"From the perspective of Al, the areas of life are merging: A privately used personal assistant can also be used at work"

PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual	73
ŤŤ	Changing human relationships	75
111	Consensus in society	63
0	Evaluation processes	67
Ø	Regulatory parameters	58

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

55 percent expect of the experts surveyed expect the proposition to be realized after 2030, 15 percent expect it to be realized within the next ten years, and 26 percent reject the proposition.

According to the respondents, a mutual training of humans and Al would have a clearly positive impact on business and society.

Over the last three years, the discussion on the topic of "Mutual Training of Humans and AI" has been technology-focused.

Currently, the discourse on this topic is shaped by technology/academia. In the future, society should take over the discourse: Every individual is affected by the topic, which is why it needs to be dealt with personally, but also institutionally.

15. Autonomous Development of Al

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

Al technologies develop autonomously, i.e., without prompting from humans.

EXPECTED IMPACT (POSITIVE/NEGATIVE) ON BUSINESS AND SOCIETY SHOULD THE PROPOSITION BE REALIZED* (Enurse in percent)





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*SURVEY WAVE 1 Basis: German experts on the subject area "Education"; n=62 (Question 1); n = 35 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither

positive nor negative or not specified

**SURVEY WAVE 2 Basis: German experts; n=113; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)

3. Which of the following sectors is currently shaping the discourse on the above-named topic area the most?/Which of the following sectors should shape the discourse on the above-named topic area the most in the future? 4. In your opinion, how has the discussion on the topic been conducted over the last 3 years?

PARTNER WORKSHOP ON THE TENSION BETWEEN



PROPOSITION DEEP DIVE

(Figures in percent)

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE PROPOSITION HAVE ON THE FOLLOWING FIVE DIMENSIONS?



1	Sense of purpose for the individual6	4
ŤŤ	Changing human relationships6	64
u	Consensus in society6	57
0	Evaluation processes	3
Ø	Regulatory parameters	71

HOW STRONGLY ARE THE FOLLOWING SECTORS CURRENTLY SHAPING THE DISCOURSE ON THE TOPIC **TODAY** AND HOW STRONGLY WILL THEY SHAPE THE DISCOURSE ON THE TOPIC IN THE **FUTURE**?



OVER THE LAST THREE YEARS, THE DISCUSSION ON THE TOPIC HAS...**



RESULTS (Main findings of the expert survey)

44 percent of the experts surveyed expect the proposition to be realized after 2030, 13 percent expect it to be realized within the next ten years, and 31 percent reject the proposition.

From the present-day perspective, the impact on society would be negative, while the impact on business would be positive. Over the last three years, the discussion on the topic has been clearly technology-focused.

That a realization of this proposition would lead to numerous unanswered questions in many areas is underscored by the experts' assessment that a broad discourse across academia, society, and politics will be needed in the future.

16. Dissolution of the Education System

PROPOSITION DEVELOPED BY THE PARTNER CONSORTIUM

The current education system in Germany (classical actors, institutions, degrees) has been dissolved by Al technologies. EXPECTED IMPACT (POSITIVE/NEGATIVE) ON BUSINESS AND SOCIETY SHOULD THE PROPOSITION BE REALIZED* (Finures in percent)





*SURVEY WAVE 1 Basis: German experts on the subject area "Education"; n=62 (Question 1); n = 28 (Question 2); figures in percent; percent missing up to 100=not specified. Questions: 1. When do you expect the proposition to be realized at the earliest? 2. What impact will this have on business and society in Germany? Shown are Top2 (very positive + positive) and Bottom2 values (very negative + negative); percent missing up to 100: neither

positive nor negative or not specified

****SURVEY WAVE 2 Basis:** German experts; n=107; figures in percent; percent missing up to 100=not specified.

Questions: 1. At the least, which type of AI technology would be needed to make the proposition a reality? **2.** How strong an impact will the realization of the proposition have on the following five dimensions? Shown are Top2 (very strong + strong)

3. Which of the following sectors is currently shaping the discourse on the above-named topic area the most?/Which of the following sectors should shape the discourse on the above-named topic area the most in the future? 4. In your opinion, how has the discussion on the topic been conducted over the last 3 years?





IMPLICATIONS

52 percent of the experts surveyed assume that the proposition will probably never be realized. Among a number of different reasons, fear of loss of control, the threat of dehumanization, and the lack of technical feasibility emerge as the three main ones opposing the proposition.

THE PROPOSITION IS REJECTED!

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EDUCATION

The Propositions: An Overview



- **1. Digital Personal Assistants:** Al-based "Digital Personal Assistants" communicate autonomously and independently with other Al-based systems.
- Generation AI: We are witnessing the emergence of a generation that uses AI systems naturally and intuitively as an integral part of their daily lives (i.e., 24 hours a day, 7 days a week).
- 3. Competitiveness: German companies that do not use AI are no longer competitive
- Audiovisual Communication: In audiovisual communication, it is no longer possible to distinguish between a real person and an Al system.
- 5. Technical Control Authority: Prior to market launch, Al-based products and services in Germany need to be approved by a technical control authority.
- Rejection of AI: In Germany, the increasing use of AI technologies in many areas of life has led to a large proportion of citizens perceiving them as a threat and consciously rejecting them.
- **7. Rural Living:** In Germany, rural living has become more attractive due to the increasing use of Al systems (e.g., use of infrastructure, medical care).
- 8. Regulatory Failure: The regulatory control (regulation) of Al systems in Germany fails.
- Urban Living: In Germany, urban living without the use of AI systems is only possible to a limited extent and leads to substantial disadvantages (e.g., in living, orientation, navigation)
- 10. Al-based Criminal Investigation: In Germany, crimes that are detected and prevented by Al systems will be dealt with by the courts.
- **11. Intercultural Conflicts:** Ethically, morally or politically incompatible AI systems lead to intercultural conflicts (e.g., trade wars or restrictions on the right to travel).

- 12. Loss of Informational Self-determination: Al technology has led to a situation in which the principle of informational self-determination* no longer applies in Germany. *"The basic right of the individual to exercise control over the disclosure and use of his or her personal data."
- **13.** Rules and Standards: For regulation, economic policy, and ethics, internationally recognized rules and standards govern the development, supply, and use of Al-based products and services.
- 14. Use of Real-Time Data: People in Germany are not that bothered about Al-based products and services continuously utilizing all the (real-time) data available about the user (location, vital functions, mood, psyche).
- **15.** Loss of Data Security: The use of Al-based products and services in Germany has dissolved the principle of data security.
- 16. "Al Nanny": Al systems are an elementary part of families and, as a "virtual" family member, fully take over individual tasks of the parents ("Al Nanny").
- 17. Loss of Privacy: The increasing saturation of everyday life with AI systems has led to a situation in which there is no longer any privacy, as human whims, mishaps, and lies are revealed as such by AI systems.
- 18. Private Decision-making: In Germany, AI-based systems completely take over private decision-making processes without involving the user (choice of job, choice of place of residence, etc.).



- Importance of Human Competencies: Companies focus on human competencies in the interaction between man and machine and continue to develop these competencies further.
- 2. Transparency in Work Performance: In Germany, the control of work tasks through Al technologies has made humans and their work performance more transparent.
- **3.** New Companies with High Al usage: In Germany, new companies are emerging in which Al technologies are integrated into all areas of day-to-day business and, in some cases, play a decisive part in steering them.
- **4. AI-based Team Composition:** Work teams are composed ad hoc based on analyses and recommendations from AI-based platforms.
- 5. Identification of New Employment Fields: New fields of activity in all areas can be predicted much faster and more accurately with the help of data and enable the targeted development of competencies in the company.
- Elimination of Industry Boundaries: The use of AI technologies has led to strong networking among companies and industries — in some areas, one can speak of an elimination of industry boundaries.
- 7. War for Talent: Cognitively demanding and creative job profiles dominate the labor market, and there is unprecedented competition for talent.
- **8.** Greater Trust in AI: People have greater trust in AI-assisted analysis results than in those provided by human colleagues.
- **9.** Administrative Leadership Tasks: AI technologies take over a large share of the administrative leadership tasks (e.g., task planning, meeting targets, controlling).
- **10.** New Job Profiles: Job profiles that are problem- and task-oriented (e.g., motivator, socializer, expert on a specific topic) dominate the working world in Germany.

- **11.** No Work without AI: In the vast majority of work situations, humans are no longer capable of working without the application of AI systems.
- **12. HR Development through AI:** Al technologies take over parts of HR development in companies on their own, without any human input.
- **13.** Al Intervention from Birth onwards: In Germany, highly personalizable, AI-based systems accompany their users from birth, evolve with them, and support interest- and aptitude-oriented lifelong learning.
- **14.** A New Understanding of Management: Since AI technologies are responsible for much of the decision-making in companies, management is mainly responsible for HR management, motivation, and creative output.
- 15. More Freelance Activities: In Germany, people mainly work as freelancers with a high degree of flexibility in terms of the choice of work content and companies, and there is hardly any long-term employment anymore.
- **16.** A Halving of the Working Week: Compared to today, the regular working week (gainful employment) in Germany has halved due to the use of AI technologies.
- **17.** No Distinction made between Humans and AI: In companies, a distinction is no longer made between humans and AI technologies (e.g., in team projects, team composition, responsibility).
- Al-based Entrepreneurship: Al technologies set up and run their own companies in Germany.
- **19. Interpersonal Activities:** Al systems have largely taken over interpersonal activities such as counselling or psychological support.



- Al Architect: The Al-architect (comparable to the software architect) is a recognized profession in Germany.
- War for Talent: Given that people only take on cognitively demanding and creative jobs in a working world permeated by AI systems, the war for "creative talent" in Germany has intensified drastically.
- Impact on Human Capabilities: Human capabilities (e.g., memory) and skills (e.g., mental arithmetic abilities) have noticeably changed through the constant use of AI technologies.
- Social Division: In Germany, the different levels of education have different access to Al technologies, which has resulted in social division.
- More Advanced Educational Training: In Germany, the extensive use of AI technologies has led to more advanced educational training to help people understand the complex systemic interrelationships (both technical and human).
- Continuous Adaptation: A predictive AI technology teaches "its" user to adapt continuously and individually to changes (new behaviors, new technologies).
- **7. Social Status defined by AI Access:** In Germany, social status and thus access to education is determined by the possession and use of AI systems.
- 8. Al-based Education within Families: In Germany, Al technologies have taken over a large share of learning within the family (knowledge transfer, tutoring...) for children and young people.
- 9. Family-own Al Systems: In Germany, family-own Al systems are the standard virtual source of advice for everyday worries and questions for all members of the family. ("Al has a place at the table").

- **10. Lifelong Learning through AI:** Personal AI systems accompany their user from birth onwards, enabling a new kind of lifelong learning.
- Basic Al Qualifications for Employees: Every employee in Germany has basic Al qualifications.
- 12. Basic AI Competence for All: Every person in Germany has a basic AI competence (i.e., they know that AI technologies are available, what they can do, where they are used, etc.) and can use them in all areas of life.
- **13.** State Control of AI: In Germany, the use of AI technology is monitored/defined by a new state authority (e.g., the AI Ministry).
- **14.** Mutual Training of Humans and AI: In Germany, the individual and his or her AI system educate each other in a symbiotic relationship.
- **15.** Autonomous Development of AI: AI develops autonomously, i.e., without prompting from humans.
- **16. Dissolution of the Education System:** The current education system in Germany (classical actors, institutions, degrees) has been dissolved by Al technologies.

One more thing... CORONA

Outbreak of the Corona pandemic and consequences for the MÜNCHNER KREIS Future Study VIII



The global outbreak of the Corona pandemic at the beginning of 2020 demonstrated just how unpredictable the 'future' can be. After the conclusion of the second survey wave of the MÜNCHNER KREIS Expert Delphi at the beginning of March 2020, things literally came to a head.

For this reason, the MÜNCHNER KREIS and its partner consortium were keen to present the development of the Corona pandemic in the light of the findings of the expert Delphi.

The MÜNCHNER KREIS, together with the Bertelsmann Foundation and the Heilbronn Campus of the Technical University of Munich, implemented this with a separate survey in which selected aspects of the connection between the Corona pandemic and the propositions of this study were examined. With these overarching expert assessments, the MÜNCHNER KREIS and its partners aim to contribute to the current discussion in order to fulfil its mandate of "providing orientation" in this special situation as well.



Dr. Ole Wintermann, Senior Project Manager, Bertelsmann Foundation

"The Corona pandemic has served as a catalyst to accelerate the process of digitalization in our lives, in the education system, and at work. Whereas up until last year, it was the exception to be able to pay for your coffee at the bakery by card, it suddenly became the recommended standard. While in recent years the German school system was still struggling with the chalk era, it is suddenly becoming clear that digital education offers huge opportunities for new methods of learning."



Prof. Dr. Helmut Krcmar, Technical University Munich, founding Dean of the TUM Campus Heilbronn

"The Corona pandemic has made one thing clear: In Germany as well, people are prepared to use new information and communication technologies if they are forced to do so. Triggered by the Covid-19 situation and the lockdown that followed, modern information and communication technologies are now suddenly and comprehensively shaping working life and interpersonal communication like never before. This made it possible to experience new digital possibilities, whether in video conferences as a consequence of a dissolving presence culture or in the use of digital services by governmental or private companies. Thus, the presumption of usefulness required for the further development of information and communication technologies usage has been established. However, proven usefulness does not necessarily imply the integration of technologies into social and economic life. For in addition to the technological prerequisites, a sufficient infrastructure and the ability to use the technologies, it is now necessary to build up-or rediscover-the right meta-skills. We are all called upon to engage in a joint, broad, and progressive discourse in order to reach an organizational and societal consensus on which of the opportunities offered by new technologies - such as AI - should be used in the future and in what form. We are now called upon to keep this discourse going while at the same time daring to change."

Method: An Overview



DATA COLLECTION METHOD	Online survey (CAWI)
DATA COLLECTION PERIOD	April 15 – April 24, 2020
TARGET GROUP	German experts on technology development, digitalization, and artificial intelligence (AI)
SURVEY TOPICS	technologies Economic development. Al development.
	and working against the backdrop of Corona
NUMBER OF RESPONDENTS	n=211

Impact of the Corona Pandemic on Al Technologies



Question: What impact will the Corona pandemic have on the significance and development of AI technologies? Basis: German experts; n=256-293; data: Mean values on a 5-point scale, without



This is most evident in the healthcare sector. 85 percent of the experts surveyed expect the use of AI technology to increase.

Accelerated development of AI technologies.

The Corona pandemic will once again increase the significance and development of AI technologies. This is most evident in the health sector. 85 percent of the experts surveyed expect the use of AI technologies to increase in the health sector. However, the Corona pandemic is also seen as an accelerating factor for the development of AI technologies in the professional context, in industry and manufacturing, and in research and development. In contrast, the experts do not see a Corona-induced increase in the use of AI technologies in the private sphere. The majority also do not foresee increased investment in quantum computing.

It is clear that the Corona pandemic has an impact on all three areas of focus in this future study (life, work, education). This is reflected in the question about the impact of the Corona pandemic on the overarching themes of selected propositions.



2 62

Data-driven

Development of Compe-

tencies in Companies

Impact of the Corona Pandemic on Life, Work, and Education under the Influence of Al

In the area of **life**, half of the experts recognize a Corona-induced acceleration in the social acceptance of AI systems, 47 percent an increasing use of voice assistants, and 45 percent assume that AI technology will become a fundamental competitive factor even sooner.

In the area of **WOCK**, the respondents believe that the Corona pandemic will lead to an accelerated development of data-based skills in companies. (62 percent). 47 percent of the experts see the Corona pandemic as having led to a rapid increase in the demand for human skills as well as in the number of companies with a high level of Al usage.

In the area of **education**, the survey shows that the Corona pandemic will accelerate the extensive use of AI technologies in education (44 percent)

At the same time, it is striking that a considerable number of experts gave no answer, which makes it clear that at the time of the survey no clear and homogeneous assessment appears to be possible yet

3 33

Changing Human

Abilities and Skills

through AI

Slowing down
Accelerating Life
Accelerating Work

Accelerating Education



4 47

Increased

Importance of Human

Competencies

ONE MORE THING ...

The Extent of the Impact of the Corona Pandemic on the Five Dimensions Discussed in the Main Part of the Study

HOW STRONG AN IMPACT WILL THE REALIZATION OF THE AI PROPOSITION(S) HAVE ON THE FOLLOWING FIVE DIMENSIONS? HOW STRONG AN IMPACT WILL THE CORONA PANDEMIC HAVE ON THE FOLLOWING FIVE DIMENSIONS BY 2030?



IMPACT OF AI* ON... | IMPACT OF THE CORONA PANDEMIC ON**..

1	Sense of purpose for the individual	. 55	48
ŤŤ	Changing human relationships	. 58	54
111	Consensus in society	. 57	34
0	Evaluation processes	61	25
Ø	Regulatory parameters	55	52

Five Dimensions

In the research process of the future study, five human-centered dimensions were identified on which AI technologies will have a particularly strong impact in the future.

Accordingly, the Corona special survey was also designed to find out what impact the Corona pandemic has on these five dimensions. (for details, see p 31). While the development, implementation, and application of AI technologies have a roughly equal impact on all five dimensions on average (across all 53 theses) (agreement values between 55 and 61 percent), the Corona pandemic has the strongest impact on changing interpersonal relationships (54 percent agreement), followed by regulatory parameters (52 percent). In contrast, the experts believe that the Corona pandemic has a relatively little impact on evaluation processes (25 percent). These results seem to have been strongly influenced by the immediate context of the crisis, as restrictions in social life and intensive government measures were in place at the time of the survey.

The Corona pandemic has the strongest impact on changing human relationships.

*Question: How strong an impact will the realization of the proposition have on the following five dimensions? (Mean average across all 53 propositions); **Basis:** German experts; n=326; figures in percent; percent missing up to 100=not specified /Pos. 3 on a 5-point scale

****Question:** How strong an impact will the Corona pandemic have on the following five dimensions by 2030; **Basis:** German experts; n=211; figures in percent; percent missing up to 100=not specified /Pos. 3 on a 5-point scale

Future of Work in the Context of Long-term Changes Due to the Corona Pandemic



Question: To what extent do you agree with the following statements about the future of work in the context of long-term changes brought about by the Corona pandemic? Basis: German experts; n=211, figures in percent; percent missing up to 100=not specified / Pos. 3 on a 5-point scale

Strong changes to working life

The Corona pandemic has greatly changed the working lives of many people at present. The experts believe that many of the associated changes will continue to be part of the working world in the future. For example, 92 percent of the experts surveyed expect conferencing tools to become an integral part of work routines in the long term. Overall, the experts also expect working life to become more flexible in terms of hours and location, and a change in the relationship between work and private life is also considered a realistic prospect by the majority of respondents. Even though Corona will bring about lasting changes in the world of work, the experts assume that there will be a new balance between presence work and virtual work rather than a complete shift away from a culture of physical presence. However, there is disagreement about whether Corona will lead to a return to old habits or to lasting change.

Increase in Working from home/mobile Office and the Consequences thereof



Question: To what extent do you agree with the following statements about working from home/a mobile office? *Focus on HR management, motivation, and creative performance; Basis: German experts; n=211; figures in percent; percent missing up to 100=not specified / Pos. 3 on a 5-point scale

Working from home could become the new normal for many people, even after Corona

Home Office

19 5

16 7

13 4

12 2

29

49

Working from home could become the new normal for many people, even after Corona. According to 64 per cent of the experts surveyed, this will lead to change in management tasks. In the future, the focus will be on HR management, motivation, and creative services. 56 percent expect greater acceptance of the use of digital assistants. However, the experts do not believe that increased working from home/mobile offices will lead to even more far-reaching changes such as the composition of work teams through AI platforms or AI-based HR development (56 and 55% respectively reject this).

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Conclusion

The push towards digitalization in Germany triggered by the Corona pandemic can have a positive and accelerating effect on the development and use of AI technologies! The course must now be set in order to avoid risks and to seize potential opportunities before they are lost. The recommendations made by the MÜNCHNER KREIS Future Study and its partners to policymakers, business, and society in the context of an Al-permeated future can be found in the Executive Summary starting on p. 12.

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MÜNCHNER KREIS e. V. www.muenchner-kreis.de

Bertelsmann Foundation www.bertelsmann-stiftung.de

SPONSOR

Bavarian State Ministry for Digital Affairs www.stmd.bayern.de

RESEARCH

ITM Consultancy www.itm.net

Innovationszentrum für Industrie 4.0 GmbH & Co. KG www.i40.de

DESIGN CONCEPT, DESIGN, INFOGRAPHICS, AND DATA VISUALIZATION

Silke Wohner www.silkewohner.com

PRINTER

Schmekies Medien & Druckerei www.schmekies.de

IMPRESSUM



LICENSING

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