Whitepaper | A+A

The Future of Work: New Work, Smarter Working and the Balance between Technology and Health

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Table of Content

Introduction ..... 3.

What is New Work? ..... 4.

Work from Home, "Workation" and Experience Spaces ..... 5.

Introduction: The Transformation of the Working World ..... 6.

Core Trends ..... 8.

Smarter Working ..... 8.

Gig Working and "Workation" ..... 9.

AI and Robotics ..... 10.

Shaping Digital Work Environments: Collaboration, Creativity and Metaverse ..... 11.

Best Practices ..... 13.

New Leeway in Production ..... 15.

Job rotation for workforce reduction and more flexibility ..... 16.

Mental Health and Prevention in the Hybrid Working World ..... 17.

Promoting Physical Health ..... 19.

Recommendations to Action for Decision-Makers ..... 20.

Why does my Company need AI? ..... 20.

Identify Corporate Objectives and start with Small Steps ..... 21.

Conclusion and Outlook ..... 22.

Introduction

„What exactly New Work means is rather difficult to define. Above all, it expresses the desire for change. However, all of its dimensions pursue one goal: providing the conditions for good work."
Dr. Stefan Rief, Fraunhofer IAO

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The world of work is facing an unstoppable change. Skills shortage, demographics and digitalization have made employee development a central issue. Technological innovations can compensate and provide solutions, but they must be consistent with the needs of those affected. Today, hybrid, flexible working time models are a must. Individuality and self-determination promote acceptance and efficiency without compromising team spirit.

What is New Work?

New Work is like a vessel into which everyone pours something different. It goes back to the American philosopher Frijthof Bergman in the 1970s. Based on his experiences, he realized that heteronomy is paralyzing and that only self-determined work is meaningful and sustainable. New Work today stands for new forms of work with more autonomy, flexibility and productivity.

Hybrid working and even "workation" (working from vacation destinations) seem more or less established, and four-day workweek models are up for discussion. Gig working, i.e. time-limited work for a specific project, also supports self-determination. AI and robotics are concepts that evoke all possible feelings, from a gold-rush mood to uncertainty. All these concepts raise the question of how working conditions can be organized in a balanced way to promote the performance, motivation and health of employees in the long run.

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Work from Home, "Workation" and Experience Spaces

Many work processes cannot be formalized to the extent necessary that regular communication and exchange become redundant. Following the pandemic-related experience of distance work, companies want their employees to be more present at the office again. At the same time, companies in rural regions realize that location-independent working forms can significantly expand the availability of their workforce. And because of remote work, the employees are no longer willing to give up their flexibility. Therefore, in larger companies like VW, Deutsche Bank and SAP, the consensus of 3-4 days in-office presence applies. Allianz and SAP allow "workations" up to 30 days, while others have no regulations for working from abroad. To make in-office work more appealing, enterprises like BASF or Siemens have created Healthineers Social Spaces, Experience Spaces, Creation Centres and Working Cafés. However, sitting together in a large room does not necessarily mean working together. Meetings should consciously be organized via an app, for example.

To guarantee the occupational safety and mental health of the teams in the new structures, it turned out that in terms of organizing the mobile work from home, it is worth following the recommendations of the Federal Ministry of Labor and Social Affairs.

„There's a growing number of ideas and initiatives with great socializing spaces for employees to enjoy coming to the office. After the pandemic and in economically challenging times, these are rather abstract concepts that need to be measured and evaluated. New Work is still in the early stages."
David Wiechmann, Vorsitzender Deutsches Netzwerk Büro e.V.

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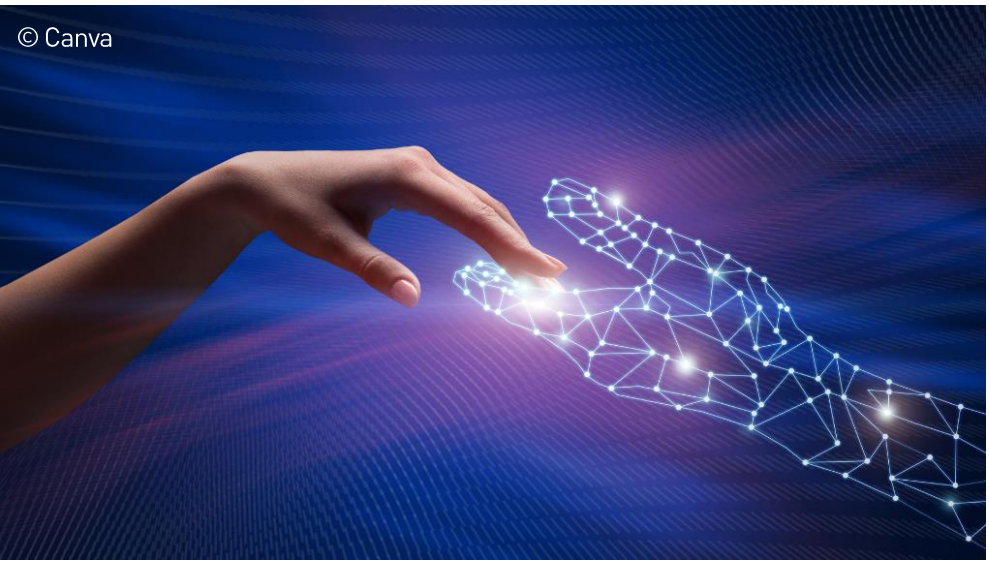
Introduction: The Transformation of the Working World

„The central driver of change is digitalization. Yet, energy transition and demographics also play a significant part. Various crises are driver number four. All this demands an enormous adaptive capacity from us.“

Dr.-Ing. Stefan Rief, Fraunhofer IAO

Digitalization, technologization, and new values and employment models mark the changes in the world of work. According to the latest report of Zukunftsinstitut, “flexible structures, hybrid work environments and a more people-centered approach will mark the future”. “The development of employees will become a core task. Promoting digital skills is essential to ensure employees are ready for the challenges of the future.” By 2030, 59 per cent of the workforce will require retraining. Therefore, 85 per cent of the companies surveyed foresee prioritizing further education. In addition to technological skills, creative thinking, resilience and lifelong learning are required, according to the World Economic Forum’s new „Future of Jobs Report 2025“.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Introduction: The Transformation of the Working World

The report predicts that by 2030, 22 per cent of today's jobs worldwide will either be newly created or eliminated due to structural changes. As a result, jobs will see a net increase of seven per cent overall - about 78 million new positions. In other words, staff with the necessary skills must be hired, while existing teams must be retrained and upskilled. „We see in particular that technology-driven skills and interdisciplinary competencies are equally crucial for the future, and the balanced interplay of both disciplines will be increasingly important. Tech trends are both core drivers for the emergence of new jobs and the biggest cause of losing existing jobs", according to Kai Helfritz, Head of Member Management and Cooperations at the German Association for Human Resource Management (DGFP).

Another crucial keyword for future-proof work is individualization. "Executives should evaluate how much contact they have with each employee. It also works digitally. Which individual factors do I need to consider?", says Rief. A caregiving employee at home has other necessities than someone independent. The age structure also demands a differentiated approach. "Older employees can contribute their experience and awareness to the collective. "It should not get lost despite maximum flexibility and freedom. "It is not just about the organization taking care of things, but also about how I can apply myself."

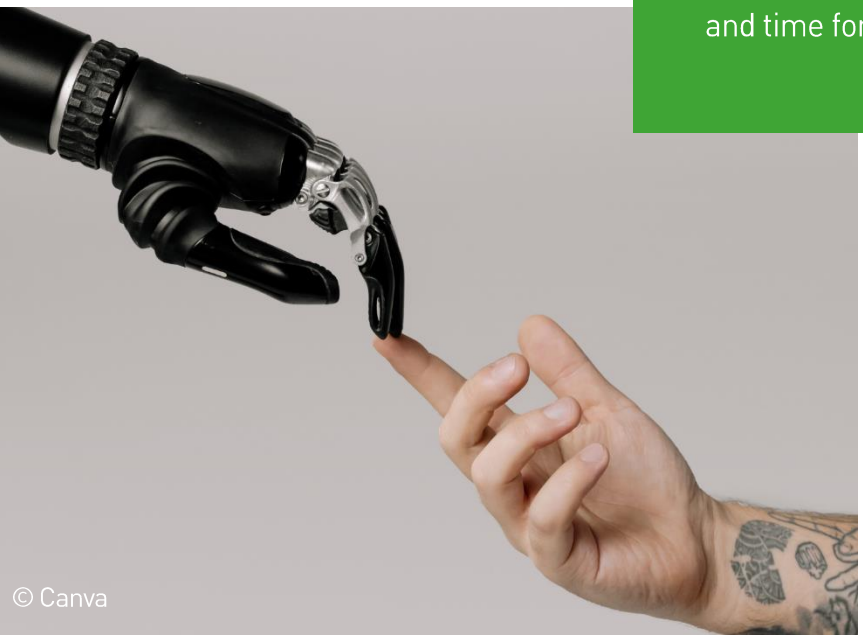
Core Trends

„AI offers countless opportunities for both companies and employees in Germany. It is of particular importance that small and medium-sized businesses address the integration of AI applications into their operations.“

Prof. Dr. Sascha Stowasser, Direktor des ifaa - Instituts für angewandte Arbeitswissenschaft

Smarter Working

Delegating monotonous work like documentation, reporting obligations or repetitive actions to digital and/or AI systems is smart. It allows a smoother workload organization. We also see an increase in efficiency and productivity. Smart technologies like network devices, better information flow, and automation can also improve innovation power. Agile methods, collaboration and interactions leave more room and time for actions that require human skills.



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Gig Working and "Workation"

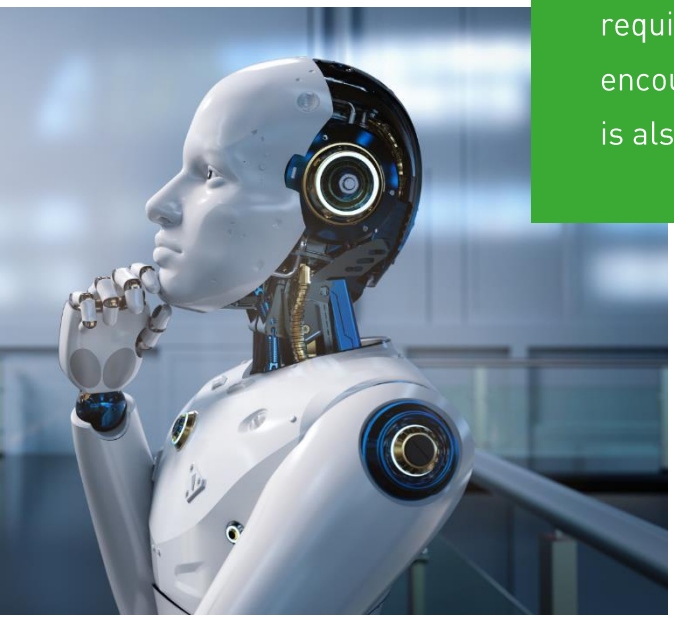
The term "Gig Working" is relatively new in the world of New Work. We already observe smaller forms in public spaces. For instance, delivery or chauffeur services that hire staff just for the time needed. In times of skill shortage and the simultaneous flexibilization of the labor market, digital platforms for project work or delegable tasks, yet also for qualified freelancers, gain importance. The European Council (EU Directive on platform work) estimates that 43 million people will be employed through platforms this year.

The advantages for employees are clear. They can decide when and which tasks they take on. They don't have any acquisition costs, and at the same time, they can work for multiple clients. The disadvantages typically include low wages and fluctuating income. For employers, the platform offers the advantage of finding quick help. Gig workers need recurrent training. However, those who want can enter a long-term commitment. "Such alliances are beneficial if the employee has a good network and knows his partners and financial resources. And, after all, working for different companies is also educating.", says Rief.
"Workation" has become established in larger companies. It's a step towards more self-determination. Working in a different country, perhaps escaping the winter grey and enjoying the Mediterranean sunlight boosts motivation. New places, metropolises and landscapes open the mind, trigger new ideas and approaches and encourage creativity. Ultimately, this is a benefit for the company.

AI and Robotics

By taking over routine tasks in documentation and bureaucracy, AI and robotics can support employees significantly. "In quality management, for instance, AI is better and more accurate than humans. It can improve stock inventory and take over production planning," says Sascha Stowasser. Thus, they are a resource compensating the work of people – German manpower counts millions – who will be retiring in the next ten years.

Data-driven decisions are objective. Trends, patterns and changes – in customer behavior, turnover and how/when they fluctuate - can be identified early. That's crucial for companies to allocate resources in line with demand and become more profitable. Decisions don't require broad experience. A large bulk of data can be well processed. Besides being efficient, AI should be user-friendly, human-centered and add value. Clear and transparent communication at any time is crucial for employee acceptance. A sustainable transformation requires convenient structures and a living culture that encourages innovation competencies. Tailored training is also helpful here.



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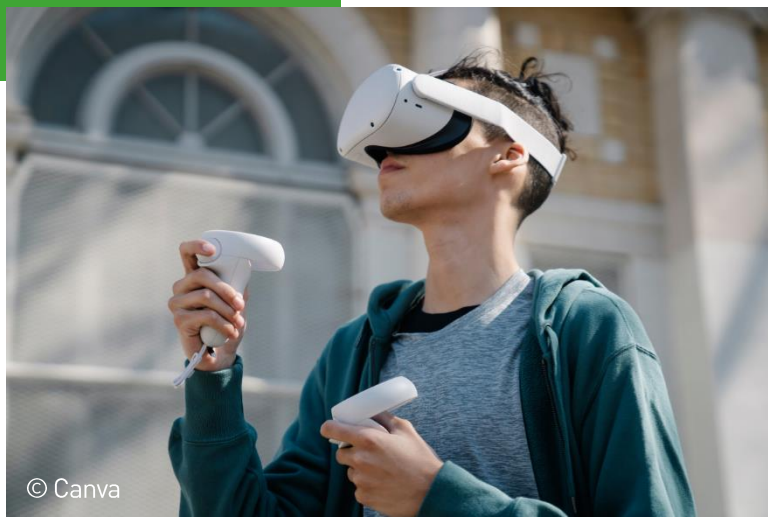
Shaping Digital Work Environments: Collaboration, Creativity and Metaverse

Metaverse describes a digital universe in which real and virtual experiences merge, and humans are at the center of all evolutions. Fraunhofer IAO is currently working on the industrial infrastructureHashtag#Metaverse-Infrastructure of tomorrow. Together with companies and scientific partners, they explore and put into practice topics like innovation, the collaboration of digital twins, creativity, new business models and the future of work.

The opening of "ExtendedWorlds.Now." on October 22 with the launch of the "Immersive Participation Lab" marks a central milestone. This laboratory represents the next generation of the so-called Cave. Cave is an immersive room where projection systems create a digital environment, enabling users to emerge and experience virtual realities at close quarters.

In addition, the lab is a crucial part of an upcoming Hub-Spoke-System. This network model combines central focal points (hubs) with decentralized locations (spokes) and promotes the exchange and collaboration between different organizations - in this case, IAO affiliates in Berlin, Heilbronn and Munich.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Shaping Digital Work Environments: Collaboration, Creativity and Metaverse

XR technologies are essential here. Including virtual reality, augmented reality and mixed reality, XR (extended reality) allows the integration of digital content into the real world and creates virtual environments for an intense, interactive experience. With the help of this technology, digital twins in product engineering and collaborative working practices should be optimized, for instance.

They also explore how immersive technology can enhance hybrid meetings and creative working processes – including the application of artificial intelligence. It also involves the examination of how people, both individually and in groups, respond to these technologies, identifying scenarios in which the combination of AI and immersive systems offers the greatest added value.
With these attempts, Fraunhofer IAO contributes significantly to technological innovation and the design of sustainable working environments.

Deeper insights and study results can be found at:
https://www.iao.fraunhofer.de/de/m/24/01/willkommen_im_metaverse.html
and
https://www.iuk.fraunhofer.de/de/themen/thema-metaverse.html

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Hybrid working models have become established for office jobs. Various arrangements range from mandatory one-day presence for everyone, ensuring a proper dialogue, for instance, to four office days for executives. Meetings outside of a team support cooperation and creativity. “At our institute, we are currently experimenting with a booking system having social functionalities, and especially on low-use days like Fridays, we use it to provoke encounters going beyond the usual teams”, explains Rief. “Sitting next to a colleague from IT whom you might not even know yet raises the awareness towards colleagues and other teams”.

Thyssenkrupp is Essen, and other major companies are establishing a modern, dynamic work environment with experience spaces enabling more dialogue and cooperation. At the Beiersdorf Campus in Hamburg, employees can choose between 25 room types. They go from flexible cooperation areas and Working Cafés to retreat spaces. Such concepts can have a positive effect on motivation and also reflect an open, modern corporate culture.

Best Practices

Virtual Reality (VR) has become increasingly important in education - even for firefighters, police and aviation. With minimal effort, it allows for regular training on how to act and react in an emergency. For instance, police cadets in Hesse can practice different operations in fictional crime scenes in a newly established VR training center in Wiesbaden.

30% of the employees at the technology company Merck regularly use the Merck-owned version of ChatGPT for traditional tasks like generating and optimizing text. "It saves 3,600 hours per week," says Chief Data and AI Officer Walid Mehenna in an FAZ podcast.

New Leeway in Production

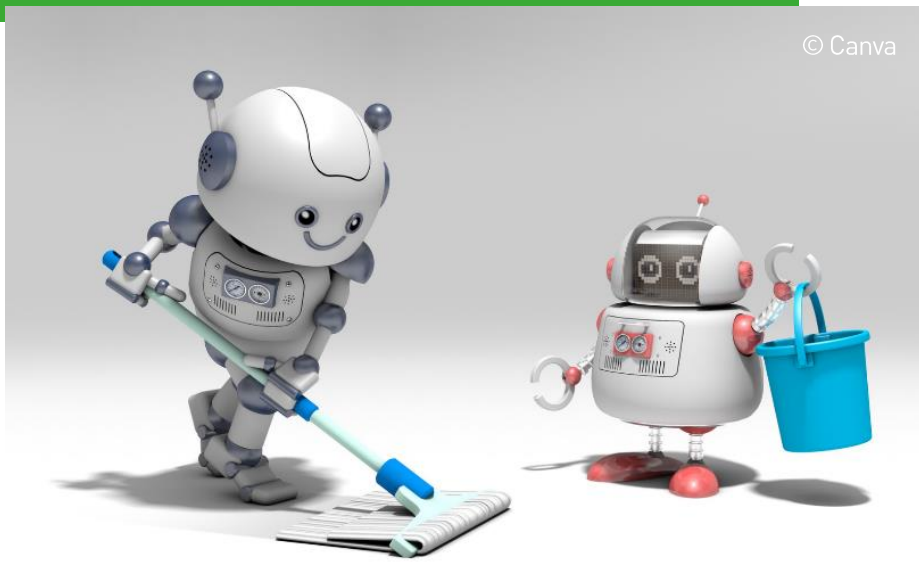
There is also more leeway in production. “Long processes often involve long waiting times”, says Stowasser. “During these times, employees can leave the company to run errands, for instance.” You need to analyze with the staff at what times presence is crucial for planning, revision and meetings, for instance. Lang Metallwarenproduktion in Neubrandenburg meanwhile offers the option of remote work with flexible hours. Coordination takes place through an app. Satisfied employees are extremely important in light of the skills shortage.

Drehtechnik Jakusch and IT developer Barix Software have developed a shift scheduling system together. With the system, employees can effectively use non-productive idle and standby times. During the ongoing production, the app schedules free time slots within the regular work activities and informs the employees so they can use the time for everyday matters like further training, childcare or care of relatives. The Ifaa - Institute for Applied Industrial Science in Düsseldorf - provides a manual on how companies can implement mobile, flexible working in production.

Job rotation for workforce reduction and more flexibility

Job rotation is a way to break routines, reduce people's physical strain and deploy employees flexibly at peak times. The Karlsbad-based PR-Tronik, a distributor selling technical components for the industry, is testing innovative forms of job rotation with the support of Fraunhofer IAO. So far, employees had a defined task like working at the incoming goods department or order picking and packing. Now, occupations that involve prolonged sitting can be alternated with jobs that require much activity. The trial phase aims to gather insights into how to support staff motivation and performance capability in an ageing society.

The automotive industry without AI and robotics is unthinkable. In other branches, however, they have also become or are already a constant part. For instance, a robotic dog will soon be patrolling the heating and power stations of Offenbach Energy Supply (EVO) to control the large combustion boilers. Using an infrared camera, it continuously takes thermal images, allowing early detection of malfunctions. These straightforward inspection rounds (also at night) support the staff, who can focus on other tasks.



Mental Health and Prevention in the Hybrid Working World

„Higher, further, faster, yet healthy, please! Managers play a key role in a rapidly changing working environment with increasing demands and pressures. Honest interest in people, sincere listening, clarity and structure are decisive factors.“
Jurek Mähler, B.A.D. GmbH

What is positive at first can turn into stress. Quite often, flexibilization and pressure to always be available cause mental strain. Proof of this is the number of sick days in recent years. Most recently, employees took an average of 19 sick days per year, mainly due to mental stress and illnesses. There are many attempts in the work context to support and even prevent. Besides knowledge transfer and the empowerment of health literacy, this includes propositions like the Employee Assistance Program (psychosocial counselling). Whether in private or professional concerns, employees and managers receive good support.

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Mental Health and Prevention in the Hybrid Working World

„Managers also play a crucial part", says Jurek Mähler, B.A.D. GmbH. Entering into a dialogue, showing interest in the person as a manager, finding possible solutions together and creating good framework conditions, conveying appreciation and visions, and giving people meaningful tasks – these are measures on the way to motivated, healthy employees and healthy companies, and thus ways to preventing illnesses. Someone who feels involved and heard enjoys working well and independently. New measures and technologies should be seen in the appropriate context (reducing their workload secures the company's future viability, jobs etc.) and introduced jointly.

In times marked by COVID-19 and now by wars and tense economic situations, it's hard to predict the future. Managers and teams must learn to command the problem and deal with ambivalence. Training at all levels is the recommended method of choice. Combined with an appropriate error culture, it can result in resilience and the courage to try new things.

Promoting Physical Health

Deep Care has developed a solution to promote physical health that works at the office, on the go and at home. Muscle disorders and skeleton diseases cause 20% of lost working days. AI assistant Isa, a sensor device the size of a mobile phone, accompanies people offline for extended periods at work to determine work environment and posture. Based on its "observations", it draws up concrete proposals followed by another analysis showing the effectiveness of the measures. As a result, employees of Deutsche Bahn, for instance, move more and use their height-adjustable desks more often. Thanks to further development with B.A.D. GmbH, Isa can now perform a risk assessment of the workplace. It scans environmental factors like brightness, ambient noise, air quality and ergonomics of working tools, i.e. table height or display alignment. Based on individual needs, it gives recommendations for action and subsequently analyses the effectiveness of implementation. A report documents the results.

„The employees experience self-efficacy, nothing gets imposed from on high."
Frederik Blohm, Deep Care

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Recommendations to Action for Decision-Makers

„Both employees and the company benefit from individualized management and further education. We must quit average observations.“
Dr.-Ing. Stefan Rief, Fraunhofer iao

The overall objective is to use new technologies to improve and streamline processes. They should support people in their physical and mental work. Intricate tasks or repetitive movements should be taken off to enable people to take care of their jobs, like doctors, for instance, take care of their patients, bakers bake bread and so on.

Why does my Company need AI?

AI is helpful if you know how and why to use it in your company. Its implementation should be well-conceived and carefully executed for automation and digitalization to succeed. Humans are no robots, and vice versa. To exploit the potential of both, you must know their respective strengths. Humans are creative and can adapt and evaluate, while robots perform even dull tasks steadily (up to 24/7 without taking a vacation) with high precision.

Corporate strategy and objectives need a clear vision to conciliate new technologies with human needs and demands in a dynamic working environment. The people concerned should be involved from the start since they are the best who can provide information on their requirements. They need to understand the added value of digitalization. They need training. Simple application examples help to gain experience and allay fears.

Identify Corporate Objectives and start with Small Steps

In the KI-Ultra project, Fraunhofer IAO worked with 29 companies to develop tools for the integration of AI applications. An Evaluation Toolkit helps businesses identify the next necessary steps.

Pilot projects are the ideal start to gain experience and minimize risks. Everyone concerned, from management to every team member, should be involved at any time and be on the same page about the project details, parameters and requirements. Accompanying training at all levels should facilitate the transition to automated work.

Conclusion and Outlook

Work implies change and evolution. Holistic working concepts combine human performance with technological productivity potential in a beneficial way. Thus, the respective strengths of men and machines can be supported and applied productively. Given the skills shortage, companies can no longer afford unmotivated staff. Adaptive organizational concepts ensure compatible interactions between humans and technology, creating favorable conditions for flexibility, progress and health.

„Human labor is dual-natured. On the one hand, it's about productivity to meet human consumer needs, and on the other, humans further develop their distinct skills by engaging with work. At first glance, the two target dimensions – productivity and personal development – appear contradictory. A key task of labor research is to identify healthy compatibility conditions to integrate these complementary goals within the division-of-labor-conditions of industrial society "

Dr. Martin Braun, Fraunhofer IAO

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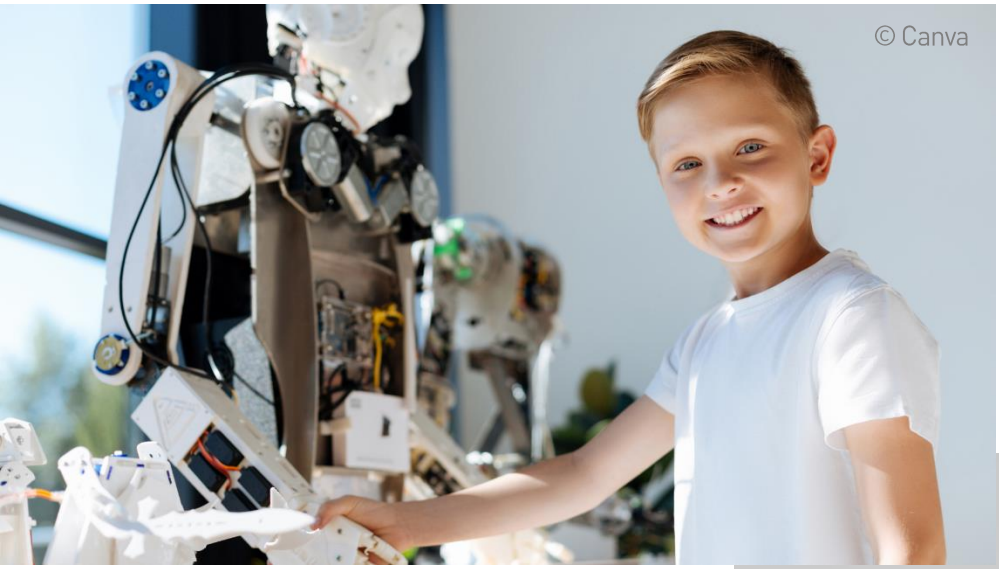
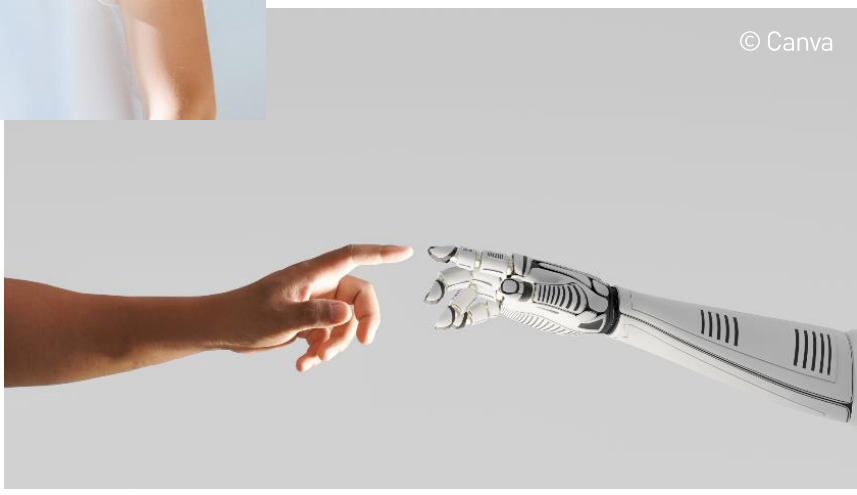
Conclusion and Outlook

The experience of meaningful development opportunities by working autonomously proves to be an indispensable condition for motivation. More than ever, the dynamics and complexity of the markets demand situational actions exceeding traditions and routines. Holistic working relationships rely on an "as-we-as-approach". Intelligent individuals think inclusively, whereas machines with their binary codes cannot. The human factor is becoming increasingly significant for a company's success. The transformation should be seen as a new form of collaboration, without worries yet with the benefits for one's own life