# IPAI IMDact

Creating the Future Together

Together, we can find AI solutions that promote the good life for all."

# Joy of New Beginnings

# IN FOCUS

Principles What Guides Us Context What Provides the Framework Experience How We Learn Culture What Inspires Us

Heilbronn | December 2024

"Our goal with IPAI is to create a European answer to AI that aligns with our regional values and empowers us to shape the future together. We aspire to become the 'Global Home of Human AI."

Moritz Gräter, CEO IPAI





# Dear Reader,

artificial intelligence is perceived as a key technology of the future. On one hand, the AI transformation presents a challenge, requiring rethinking and new resources; on the other hand, it offers immense opportunities for our companies and for us as a society. We need it to secure our competitiveness and to actively shape the future. IPAI sees this opportunity and has made it its mission to support companies in implementing AI successfully and profitably. At IPAI, we aim to provide all the necessary ingredients for this AI transformation: an innovation ecosystem that fosters exchanges between different stakeholders - from research and politics to companies - supporting services like AI infrastructure, and training offerings for various target groups within companies, as well as an inspiring environment and a trusted space for open exchange among our members.

Our goal with IPAI is to create a European answer to AI that aligns with our regional values and empowers us to shape the future together. We aspire to become the "Global Home of Human AI." This home will highlight the many facets of "Human AI" and the diverse perspectives of stakeholders within our AI ecosystem – and beyond.

The following four interconnected parts encapsulate our vision: **Principles – Context – Experience – Culture.** 

**1 Principles\_** IPAI follows a values-driven approach. Our goal is to contribute to European AI value creation in line with our shared visions of a good life in Europe. This part explains why IPAI emphasizes Human AI – and what this means.

2 Context\_ Which principles, values, and guidelines are

relevant for the development and application of AI solutions largely depend on context. For instance, an automotive manufacturer has different use cases than a bank and therefore must adhere to different ideals and standards. Despite these differences, there are many shared challenges. This part profiles the IPAI community and showcases the diversity of AI application contexts.

**3 Experience\_** Applying AI is a long-term process. We continuously evolve alongside various (foundational) technologies, gaining experience, learning, optimizing, and strengthening along the way. Openly sharing experiences and learning together helps us progress faster. This part demonstrates what makes a strong and diverse IPAI community, as well as the value of peer-to-peer learning.

**4 Culture**\_ Our way of innovating and creating value in Germany is fundamentally different from that of other countries, whether East or West. Recognizing Germany and Europe's strengths – process optimization, high quality standards, excellent research, and industry diversity – we aim to find our own path in the AI transformation. This is the focus of the final part.

We want to successfully drive innovation and value creation based on our own unique approach. IPAI firmly believes that together, from Heilbronn, Baden-Württemberg, and Germany, we can become the Global Home of Human AI. Together, we have every reason for optimism.

Warm regards,

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# What Guides Us





# Humans at the Core

Artificial intelligence must not be an end in itself. We need value-driven principles for a "Human AI" to shape the AI transformation.

Human AI involves consistently focusing the development and application of AI on people. This is also the European approach. The EU AI Act explicitly aims to "promote the deployment of human-centered and trustworthy artificial intelligence." However, human AI requires more than just compliance with regulations. It involves defining clear values and standards, specific goals, and positive visions and integrating these into technological processes. Shaping AI also means taking responsibility for the impacts of artificial intelligence on people's lives and deliberately guiding where and how the technology should—and should not—be used.

Human AI means that human needs, dignity, and freedom are at the center. AI must not lead to human alienation or control by technological systems. Precisely because AI systems already surpass us cognitively in many areas today, AI must remain a tool that empowers and supports people—helping us better navigate our lives. The Renaissance humanist philosopher Pico della Mirandola emphasized in his "Oration on the Dignity of Man " humanity's unique capacity to shape and develop its own nature. This ideal of self-determination and free development of human potential can also serve as a guiding principle for AI systems' development and application. AI should support people in realizing their potential rather than confining them to predefined patterns, limiting their freedom, or even replacing them altogether.

To ensure that AI is used for the benefit of humanity, we need guiding principles. Principles provide direction, especially in unstable environments and new situations where simple rules are insufficient. While rules are clear and rigid instructions that must be strictly followed, value-driven principles offer more interpretative flexibility within the given context, encouraging independent action and creative solutions.

The following ten principles can serve as an ethical compass for the AI transformation.

## 1\_Trust & Transparency

People must be able to understand how and why Al systems make decisions. Only when users and decision-makers understand how an Al arrives at a particular result can they build trust in the technology, which is essential for the sustainable integration of Al. Only through clear, transparent decision-making processes can Al be used in socially relevant areas over the long term and earn people's trust.

# Human AI must meet the needs and perspectives of a diverse society."

# 2\_Responsibility & Accountability

Responsibility and accountability are central principles to ensure that AI systems are used in a manner that respects human dignity and aligns with our values. Responsibility for decisions must not be delegated to machines. Companies, developers, and users bear responsibility for AI's use. Only through clear responsibility structures can trust in the technology be established.

# 3\_Autonomy

Human freedom of choice must not be restricted by introducing AI systems. On the contrary, the transformation should help strengthen individual self-determination. AI can assist us in solving complex problems and processing information faster, but the final decision-making authority must rest with humans. Thus, humans should always be able to question solutions proposed by AI systems and make independent decisions.

# 4\_Common Good

Al applications should have a positive societal impact. Access to Al technologies should be distributed fairly and equitably so that disadvantaged groups can also benefit from technological progress and actively participate in shaping the future. A positive societal impact means that Al contributes to strengthening social cohesion, creating new opportunities for education and employment, and improving access to essential services such as healthcare.

# 5\_Sustainability

The use of AI should always consider its long-term impacts on the environment and society. This means not only developing and deploying AI systems for ecological purposes, especially in the fight against climate change, but also designing the AI systems themselves sustainably, particularly in terms of resource consumption.

# 6\_Openness & Diversity

Human AI must meet the needs and perspectives of a diverse society. Diversity means incorporating different backgrounds, experiences, and perspectives into AI development to minimize biases and ensure AI reflects society as a whole. This requires open-source approaches in AI development to reduce dependence on proprietary vendors and to preserve cultural and linguistic nuances. A transformation that emphasizes openness and diversity builds trust and enables solutions that are inclusive and fair - for all, not just a select few.

# 7\_Participation

The AI transformation must be designed to be participatory. People should have the opportunity to actively discuss and shape decisions regarding AI's use. Genuine participation ensures that the AI transformation considers the needs and desires of society. Participation strengthens acceptance and trust in the technology and allows for the inclusion of diverse perspectives and the early identification of potential risks. This makes AI applications more transparent and trustworthy, leading to a more sustainable integration into our society.

# 8\_Augmenting Human Capabilities

Human-centered AI systems should support employees by augmenting their capabilities rather than replacing them. The goal is to enable people to perform their work more efficiently, creatively, and accurately by using AI as a tool. Humans remain the main actors, while AI helps them maximize their strengths and compensate for their weaknesses.

# 9\_Shaping & Implementing

A key principle of the AI transformation is not only to formulate ethical and social principles but to actively put them into practice. Social responsibility does not end with theory or the formulation of desirable goals; it requires concrete action. We already have the skills to develop AI applications. To align these with our values and principles, we must take action and actively shape them. Even if the first step is not perfect, there is inherent value in deliberate action. Responsible AI is created through doing—not just through thinking.

## 10\_Lifelong Learning

The rapid technological developments and the associated changes in the working world require people to continuously acquire new skills and adapt. AI systems are constantly evolving. Only those who view lifelong learning as a fundamental part of their personal development can fully leverage the opportunities and tackle the challenges posed by this technology. Lifelong learning enables people to take an active role in shaping the Al transformation, keeping them both competent and capable in a changing world. The concept of human-centered AI thus also includes a commitment to education, aiming to empower people in their interactions with artificial intelligence. Human AI should also be seen as a platform that facilitates access to education and encourages the continuous development of skills. Education is more than just imparting knowledge; it's about fostering critical thinking, creative problem-solving abilities, and ethical awareness. Only on the basis of education and reliable information are people able to understand the principles of responsible AI development and apply them meaningfully in their respective contexts.

Education is closely linked to democracy. A democratic society thrives when citizens make informed decisions and actively participate in political processes. For the development and use of AI to align with societal values, everybody must be empowered to engage in this process.

Education enables people to actively and autonomously participate in shaping society and its future. A well-informed public can critically examine how AI is used, ensuring that decisions are made in the interest of the common good. Comprehensive education in the sense of lifelong learning thus creates the foundation for AI to remain a positive force, serving society and contributing to the development of human potential.

AI presents a tremendous opportunity to improve people's lives, tackle social challenges, and drive economic innovation. However, this can only succeed if humans are placed at the core of the AI transformation. Artificial intelligence is good when we design it well. This is the rewarding task before us. Let's get started! O

Artificial intelligence is good when we design it well. This is the rewarding task before us. Let's get started!"



MIT economist and Nobel laureate Daron Acemoğlu warns against one-sided automation and advocates for an application of AI that enhances human capabilities.

#### Future of Work\_

What Do We Want from Machines?

### Daron Acemoglu, there is this common narrative that technological progress makes everyone better off in the long run. What's your view on that?

Technology has improved comfort, health, and consumption, but there are three challenges. First, how long does the "long run" take? If it's 200 years, it's irrelevant for people today. Second, technology isn't always used wisely, like nuclear physics, which led to bombs. Third, technology can control people, benefiting some while harming others. To fully harness technology's potential, we must consider its use and the institutions shaping it.

There have been exaggerated productivity forecasts about AI. Why do you think these are overblown? Many see AI as a revolutionary technology with huge economic benefits, but this belief often justifies harmful actions like job loss and threats to democracy. My research shows AI has limited productivity impact, with only 1.5% of U.S. firms investing in it by 2019. Many manual and social tasks remain unaffected, and I estimate only about 5% of the U.S. economy will be impacted by AI in the next decade. While significant, it won't cause the massive transformations some predict. Do you see a risk that companies will use AI to automate jobs?

Absolutely. My research shows that technology often automates human tasks, boosting productivity but increasing inequality. For 40 years, we've prioritized automation without creating new tasks for workers, leading to stagnant wages and rising inequality. While AI could extend human capabilities, the current focus on automation won't unlock its full productivity potential.

#### You make a distinction between machine intelligence and machine usefulness. Could you explain this distinction?

"Machine intelligence" suggests machines are nearing human-level autonomy, but this misses the point. Machine usefulness focuses on machines enhancing human capabilities, helping us perform new tasks and improve productivity. This reduces the risk of excessive automation and shifts the focus to expanding human skills, aligning with a more human-centered approach.

#### Does this mean that humans need to remain in control, in the "driver's seat," so to speak?

The term "remaining in the driver's seat" is often misunderstood. For instance, the Chinese government claims humans are in control, but with information restrictions, genuine autonomy is doubtful. In some cases, it may just mean humans are present while machines do the work. True machine usefulness should expand human capabilities, not just automate everything. While some automation is essential, like using excavators instead of shovels, it would be tragic if machines displaced workers without creating new opportunities. That's why creating new tasks is crucial.

### Should workers have more of a voice in shaping how these technologies are developed?

Workers' voices are crucial not only for fairness but also for developing useful technology. "Machine usefulness" means improving workers' problem-solving abilities and expanding their capabilities. For example, machines could help electricians tackle complex tasks more effectively. Developing such technology without worker input is misguided, as workers possess valuable »tacit knowledge« about real challenges and needed support. Their insight is essential for ensuring technology truly benefits them. Does machine usefulness mean providing workers with expertise they didn't have before?

In my paper with David Autor and Simon Johnson, we argue AI can help in two ways: as a training tool to upskill workers and by creating new types of expertise. For example, Ford's factories in the early 20th century used new technologies to enable workers to perform technical tasks, improving production and reducing costs. When applied correctly, technology expands workers' capabilities – this is "machine usefulness".

## Do you see a possibility for this redirection towards machine usefulness to reduce inequality?

Yes, absolutely. What I'm advocating for is a redirection of technological development toward boosting expertise and creating new tasks. If we take this path, it could be self-sustaining and even profitable for companies in the long run. But we need an impetus to push us in that direction because right now, we're not heading there.

## What are the right questions we should be asking about machines and technology today?

The key question is "what do we want from machines"? Even if we could generate immense wealth with machine intelligence, I would be unhappy with a society where humans lose their autonomy and agency. Norbert Wiener once said, "The future should not be one where we live in hammocks, served by machines." I fully agree with that. We must ensure that technology supports human autonomy, not replaces it. O

Daron Acemoğlu is a Professor of Economics at the Massachusetts Institute of Technology (MIT).

# The Joy

Veronika Prochazka is Head of Product & Platform Strategy at IPAI, responsible for the platform's offerings.

New Beginnings



Shaping

Germany and Europe have everything it takes to actively shape the global AI landscape. Let's rediscover the unwavering joy of shaping – and get started.

Photo Sebastian Donath

In the fast-paced dynamics of AI transformation, Europe stands at a crossroads: Do we want to leave the race to the U.S. and China and buy solutions and expertise in the future – or do we want to have a say in shaping what future AI applications look like? Whether we "Make" or "Buy," one thing is clear: Germany and Europe have the necessary capabilities to actively shape AI in line with our values. What may be missing is an uncompromising passion for shaping.

# EUROPE'S STRENGTHS AS A DISTINCT USP

With the EU AI Act, Europe has shown that we want to develop and apply AI in a values-based way. We have created the legal framework to ensure that AIbased technologies align with citizens' fundamental rights, laying the foundation for trustworthy AI. Yet, this remains a theory for now - now it's time for practical implementation. This is far from easy, but we believe that AI transformation in Germany and Europe will succeed if we focus on and leverage our strengths. Germany has traditionally excelled in fundamental research. Many innovations implemented in the U.S. or China today are based on insights from our universities. Additionally, there's a strong industry expertise here, with numerous mid-sized companies that lead their niches globally and possess deep

market and process knowledge. Moreover, Europe has a clear commitment to the common good. These strengths should be used to develop AI that not only solves concrete problems efficiently but also promotes the good life – a clear USP.

#### INSPIRING SHAPING, MINIMIZ-ING OBSTACLES

At IPAI, we aim to foster the joy of shaping. IPAI SPACES is set to be our first "Home of AI," where our community comes together, exchanges openly, and explores with curiosity. Here, outstanding fundamental researchers, industry experts, market and process specialists, and AI experts collaborate to create new solutions and reach goals faster. At the same time, we will provide tailored offerings in the areas of infrastructure services, qualification, and matchmaking to help our members swiftly overcome the biggest obstacles in their AI projects and move into action. We've also developed formats for our community that offer fresh ideas and perspectives for solving familiar problems. For instance, the IPAI Living Room is designed to stimulate creativity and inspiration through artistic engagement with Al. We want to demonstrate that shaping AI in line with our European values is a fulfilling task-perhaps not in spite of, but precisely because of the many challenges.

#### STRENGTHENING STRENGTHS -AND GETTING TO WORK

In Germany, we often emphasize what we can't do: we're not fast enough, too risk-averse, we invest too little, hesitate, and miss opportunities. At IPAI, we are determined to focus on our strengths and draw energy from an unyielding passion for creation - continually finding new paths, evolving, learning, and solving the challenges we face creatively. Europe has the potential to play a leading role in the global AI landscape. Let's roll up our sleeves and get to work. O



# AI Debate\_ Optimism



Luciano Floridi is the Founding Director of the Digital Ethics Center at Yale University.

Yasser Jadidi is the Chief Research Officer at Aleph Alpha Research in Heidelberg.



# and Caution'

Al development presents us with many ethical challenges. Philosopher Luciano Floridi and Aleph Alpha's Head of Research Yasser Jadidi discuss trustworthy AI, the biases in language models, and what it takes to further develop AI for a better world.

# Luciano Floridi, where does the current debate on ethical AI stand?

Luciano Floridi: We're seeing a misalignment between ethical AI debates and legislative processes. In some cases, the ethical debate continues as if nothing has changed, overlooking frameworks like the EU AI Act. It's essential for the ethical debate to reconnect with developments in compliance, risk assessment, and responsibility. My concern is that the debate could become insular, disconnected from the real-world implications of AI technologies, legislation, and business practices.

Yasser Jadidi: Your points are valid, especially from a European view. The need for ethical AI discussions is more urgent than ever. AI has certainly posed a wide array of challenges in recent times, such as its influence in social media addiction, the rise of deep fakes, and the cost in energy and water consumption. The concentration of AI development in a few companies is also alarming.

### Yasser, could you explain what Aleph Alpha does and what differentiates it from other AI companies?

Yasser Jadidi: Aleph Alpha is a mission-first company focused on creating sovereign, human-centric Al for a better world. Sovereignty, in our context, is about giving control to our customers rather than being tied to a specific geography like Germany or Europe. We also provide open-source models and a tech stack that allows customers to build their solutions using their own data without sharing it with us or anyone else. Our stack is explainable, transparent, and source-open.

### Sovereignty, for us, means truly empowering our customers with choice and control. Luciano, from your philosophical perspective, what does trustworthiness mean in the context of AI?

*Luciano Floridi:* Trustworthiness in AI is meaningless unless we specify what aspect we are referring to. For instance, you could have a highly trustworthy autonomous weapon – completely reliable and transparent – but that raises the question of whether it's the kind of trustworthiness we desire. Or take AI systems like ChatGPT which are prone to biases, incompleteness, and even hallucinations. Trusting them blindly, especially for critical tasks, is dangerous. So, instead of talking about AI being trustworthy or not, we should discuss trust in specific contexts: "Trustworthy for what?"

Yasser Jadidi: Luciano's point on trust is crucial. AI models are typically evaluated with benchmarks – standardized datasets with prompts and expected answers. However, these benchmarks often ignore moral values, cultural diversity, or bias, and may even reinforce them. Different cultural contexts affect acceptability of actions, but many models reflect a narrow cultural perspective. This leads to AI outputs that can be biased or culturally insensitive, depending on who supervises and trains the model.



Luciano Floridi: Absolutely. For example, if you ask ChatGPT for a horse steak recipe, it might refuse, citing cultural or ethical reasons, though horse meat is common in places like Italy. But if you ask for a beef steak recipe, it provides one immediately. This shows the cultural bias in the AI's training. These systems don't understand cultural differences – they're statistical models without reasoning. Human oversight is essential to quide them.

Yasser Jadidi: Public benchmarks often fail to capture global diversity in values and perspectives, leading to biased outputs. Studies show that models like ChatGPT tend to lean politically left-liberal in their responses. While some may agree with these views, it's not ideal for democratic discourse if AI subtly influences users. AI must reflect diverse perspectives and reduce bias, a major challenge in current alignment efforts.

*Luciano Floridi:* This issue worsens when only a few companies can perform alignment at scale, concentrating power. The ethical and cultural values in these models are shaped by a small group, which may not reflect societal diversity. To address these challenges, we need more transparency and broader participation in the alignment process.

*Yasser Jadidi:* The lack of transparency in data processing is also a significant concern. When using tools like Google Maps, we provide data that improves these systems, but this data also creates profiles used in the data broker industry, often unnoticed by the public. Another effect of our constant interaction with these systems is the potential for biased perspectives we may gain. Similarly to skewed social media feeds, we can get influenced by the world views of the AI we are interacting with.

*Luciano Floridi:* Your points raise a key issue: the control a few companies have over the information we access and how it's shaped. Big Tech dominates AI, consolidating power to control both the questions we ask and the answers we receive. This scenario resembles something out of 1984 – those who control the questions, shape the answers, and those who shape the answers influence reality. We need to implement much stronger legislation and ethical oversight to ensure that these companies do not operate unchecked.

Yasser Jadidi: Many large tech companies are aiming to lock in users into their ecosystems, while also employing a strategy called 'blitzscaling,' which focuses on rapid growth in order to establish a monopolistic market structure. Companies like OpenAI are turning AI models into applications behind APIs, cross-funding their systems to retain users. As AI is still in its early stages, regulation and consumer awareness are crucial. People need to understand system biases and the implications of sharing their data.

Luciano Floridi: We must differentiate between open and proprietary systems. Proprietary systems can lock users into a single provider, making governments or industries dependent, risking monopolistic control. For instance, during the G7 in Italy, there was a focus on using open systems for sensitive parliamentary data to avoid reliance on a single provider. This foresight is essential globally to maintain control over information and technology.

**Frage:** It seems that we're circling back to the issue of trust in AI models. Luciano, you said that we need AI models tailored to specific contexts to truly trust them.

Luciano Floridi: My warning is that the current AI bubble is going to burst, and when it does, the costs will be immense. However, we must ensure that we don't throw everything away when this happens. AI is a very valuable technology that we need in our increasingly complex society, but we must use it wisely and understand its limitations. My hope is that we can salvage the best aspects of AI and continue to develop it in a way that benefits society.

Yasser Jadidi: We certainly agree that there has been some hype and not every Al company has found a working business model, yet. The significant 9-figure investments into AI models are putting heavy burden on a return-on-investment perspective. This is not unlike any other technical revolution in the past and of course there cannot be only winners. We are nevertheless convinced that some companies will use this pivotal point to build empires, and Aleph Alpha's partners and commercial traction make us optimistic about the next years.

Luciano Floridi: The collapse may not directly impact the biggest players, but it will certainly shake up the industry. We could see significant consolidation in the market. The key takeaway here is that we must be cautious and realistic about the promises of AI. It's not a panacea that will solve all problems, and we need to approach it with both optimism and caution. O 66AI is a very valuable technology that we need in our increasingly complex society"

Luciano Floridi, philosopher and AI ethicist

# AI Application\_ Trust with Method

Trustworthy AI provides a foundational framework that companies must adapt to their needs. Fraunhofer researchers offer concrete recommendations for action.

**sing AI is a matter of trust.** Whether customers trust an AI chatbot, employees in companies accept AI-based solutions, or people are willing to step into autonomous vehicles – without trust, these technologies will not be used. Trust is the key to unlocking AI's full potential, and for that, AI itself must be trustworthy. But what does that mean, and what criteria are essential for implementing Trustworthy AI?

The Fraunhofer Institute for Industrial Engineering (IAO) offers valuable guidance in its whitepaper "Vertrauenswürdige KI und verwandte Konzepte verstehen und anwenden" ("Understanding and Applying Trustworthy AI and Related Concepts"). It presents a comprehensive analysis of the requirements and principles necessary for developing and implementing Trustworthy AI systems. The goal of the whitepaper is to provide companies with orientation on how to use AI systems safely and ethically.

The European Commission (EC) has shaped the term "Trustworthy AI" through its High-Level Expert Group on AI (HLEG), establishing ethical guidelines intended for practical application. The EC HLEG has defined seven main requirements for an AI system to be considered trustworthy:

1. Priority of Human Agency and Oversight:

Al systems must not replace human autonomy but should support humans instead.

- 2. Technical Robustness and Safety: Systems must function reliably and be protected against malfunctions and attacks.
- 3. Privacy and Data Quality Management:

Protecting users' privacy and ensuring data integrity are essential.

- 4. Transparency: Decisions made by AI must be comprehensible to humans.
- Diversity, Non-discrimination, and Fairness: Al systems must not discriminate against social groups and should promote equal opportunities.
- Societal and Environmental Wellbeing: Systems should have a positive impact on society and the environment.
- 7. Accountability:

Decisions must be traceable, and it must be clear who is responsible.

The Fraunhofer researchers have aligned these requirements with other related concepts that play a role in discussions about the ethical use of AI. Each of these concepts has different focal points but shares the common goal of making the technology safer, more transparent, and user-friendly.

"Explainable AI" (XAI) aims to make model decision processes understandable for users, thereby strengthening trust in the technology. "Fair AI" ensures that no groups are discriminated against and biases in decision processes are minimized, while "Ethical AI" refers to the moral obligations of developers.

In contrast, "Green AI" aims to minimize the energy consumption of AI systems and promote ecological sustainability. "Responsible AI" combines various ethical principles to ensure responsible use of AI. Finally,



AI must act convincigly and comprehensibly from a human perspective."

"Human-centered AI" places human needs at the forefront, aiming to ensure that systems support and empower users.

While these concepts have significant overlaps, the Fraunhofer team notes that all of these approaches are limited in guiding concrete actions. Trustworthy AI should be seen as a "framework" that can provide orientation but must be adapted to each specific application. Additionally, these requirements sometimes conflict. For example, the demand for transparency may reduce the performance of AI systems.

The Fraunhofer whitepaper offers recommendations for the implementation of Trustworthy AI systems:

- Adapting Guidelines: Companies should use the guidelines for Trustworthy AI as an orientation and adjust them to their application cases.
- Interdisciplinary Teams: Technical developers should work closely with ethics and legal experts to incorporate ethical requirements into the development process from the outset.
- Prioritization: Conflicting requirements must be clearly prioritized, taking both technical and societal aspects into account.
- 4. Clear Responsibilities It is important to establish

clear responsibilities to prevent a diffusion of responsibility.

 Employee Participation: Employees should be involved in the introduction and use of AI systems to foster acceptance and trust.

However, trust is largely built through practical experience. Users need the opportunity to interact with AI and observe its behavior in daily life. A crucial role is played by the explanation of AI decisions. However, even the best explanations do not automatically guarantee trust. Rather, AI must act convincingly and comprehensibly from a human perspective in real-world situations. Trustworthy AI is more than a technical challenge – it is a sociotechnological task requiring collaboration among developers, companies, and users. Only if all parties work together and are aware of their responsibilities can we develop AI that people truly trust. O TEXT by Thomas Vašek

SOURCE Jessica Wulf, Diana Fischer-Pressler, Lydia Uhler, Marie Heidingsfelder, Simone Kaiser, Janika Kutz: "Vertrauenswürdige KI und verwandte Konzepte verstehen und anwenden". Fraunhofer Institute for Industrial Engineering (IAO), June 2024, commissioned by IPAI Silvia Milano is an Assistant Professor of Philosophy specializing in Al Ethics and Epistemology at the University of Exeter and currently a Humboldt Fellow at Ludwig Maximilian University of Munich.



\_Ethics

# "We Need Guardrails"

Philosopher and AI ethicist Silvia Milano discusses responsibility and trust in the use of AI assistants.

#### Silvia Milano, what is AI ethics?

I view AI ethics as a practice, not a rigid framework that will work in every possible case. As AI technologies rapidly evolve, our focus should be on the short- and long-term consequences and their impact on the structure and values of society. What are the issues we should be concerned with as a democratic society in the age of AI?

A key concern is the shift of power from democratic institutions to private companies, which develop systems we increasingly depend on without being bound by the same rules. This creates regulatory challenges, especially across borders, and raises risks when these technologies fail or become inaccessible.

# What principles do we need in order to manage these situations?

Democratic principles, like transparency and power sharing, are essential. While ideas like explainable AI are valuable, the real challenge is in their application. There's no single solution, and the field remains open to practical challenges.

## One of your research topics is our interaction with AI assistants. How would you characterise such a system?

Al assistants help us make decisions based on our preferences, especially in areas where we might struggle. They can find information efficiently or complete tasks quickly, saving time for more valuable activities.

# So interacting with AI assistants makes our work and lives better?

Al assistants offer benefits but also expose us to exploitation. Built on collective data yet monetized by private companies, they follow private sector rules. My work explores how to balance the freedom gained through technology with the freedom we sacrifice to use it—a societal issue we must address.

Would you ascribe agency to systems

#### such as ChatGPT?

Many use ChatGPT daily, but it's not neutral and subtly shapes our thoughts. It can be seen as one entity interacting with many or as a personalized assistant, extending our agency. In this view, it could act as an employee or an extension of ourselves, with some responsibility put back on the user.

### From an ethical point of view, who is responsible when such assistants make mistakes in performing tasks while interacting with humans?

In the current environment, more responsibility should be placed on tech companies. While some argue this could hinder innovation, a conceptual engineering approach is needed. Instead of focusing on current cases, we should explore why responsibility is necessary in these scenarios and define its features based on practical needs.

## One obvious use case is chatbots in customer relations. What do you think are the main ethical challenges for these specific systems that interact with customers?

Users should always know if they're interacting with a chatbot or a human. This is easier in specific cases than with general purpose models, but it should be made clear in the user interface. Ethical guidelines should ensure the chatbot is polite, helpful, accurate, and respectful of conversational norms.

#### Do we need specific guardrails depending on the context in which these systems operate?

Yes. In specific business needs, you might have guardrails to determine the minimal operational needs for a system to achieve quality interaction with the customer. This becomes more difficult with more general-purpose models like ChatGPT, which are used in various scenarios. Let's turn to chatbots in state administ-

#### ration. When chatbots interact with citizens, how does this relate to the challenges in the context of democracy?

That's a great use case. Benefits include streamlining processes, improving accessibility, and empowering citizens. However, risks arise from adapting privatesector models for public use, which can lead to economic dependence and influence future access. Another concern is the potential biases in language models due to their training data.

### Do you think people should have the right, at least to some extent, to choose whether they want to interact with an artificial system or with humans?

That doesn't sound like a great idea. It could lead to self-selection effects, making the system less efficient and potentially unviable. This could also harm those who rely on the automated system and risk undermining the neutrality that bureaucratic administrations strive for. What would be needed to create a trustful atmosphere in the corporate context?

We need to be very clear about the purpose of the interaction, the information it's based on, and how the system is allowed to act on that information is crucial. In defined settings, guardrails ensure quality control and maintain oversight. This is crucial because if trust is broken, users may not notice.

# Would you personally trust an AI system?

Philosopher C. Thi Nguyen defines trust as an unquestioning attitude, where you use something as part of your own agency without doubting its function. With Al, it's hard to know when that trust is broken. This is why we need institutions to help monitor and understand Al systems. Trust is easy to gain but requires mechanisms for accountability and transparency to ensure it's well-placed. O

# Statements\_ Fundamentals

What Does Human Al Mean - and Why Is It So Important?

# **Ethical Standards** and Robust Data Protection Measures

#### Falk Borgmann

Head of Consulting Deepshore

"Human AI" represents the integration of artificial intelligence with societal values and human needs. This means developing AI systems that are transparent and accountable. Data protection, confidentiality, and independence are essential in this process, as AI also carries risks. It does not automatically guarantee that technology will be used safely and ethically. Data privacy breaches, misuse of sensitive information, and dependency on specific technologies or companies are potential dangers. Therefore, ethical standards and robust data protection measures are indispensable. Only through the responsible development and application of AI can we ensure that its benefits outweigh the negative impacts. Particularly when using off-theshelf AI services from the big tech corporations, German companies still seem to me to be a bit too careless at the moment."

# Achieving Top Innovation with Human Al

Thomas Laue Digitalization Officer, City of Heilbronn

"As a municipal administration, the city of Heilbronn faces many challenges, such as demographic change. Artificial intelligence, particularly in the form of Human AI, offers us promising solutions. We anticipate significant efficiency gains and relief from routine tasks. Another goal is to equip our employees with the necessary skills to fully leverage the opportunities of AI. Noand low-code applications play a key role here, as they simplify access to AI. Equally important is the efficient management of our data and processes to successfully implement AI in practice. The continuously growing IPAI ecosystem is an invaluable asset in supporting and applying these developments. Even co-working within IPAI inspires exchange with like-minded individuals, sparking many ideas and project concepts. Our aim is to actively shape this technological transformation as part of this network, positioning ourselves at the forefront of innovation."

# Human Core Values

#### Anna Spitznagel Co-Founder trail

"For me, Human AI means harnessing AI's immense potential to tackle the major challenges of our time. However, we must not overlook the associated risks. It is essential that AI is developed and applied in alignment with our fundamental human values. Institutions bringing AI solutions to the market hold the responsibility to follow a trustworthy approach where humans remain in control. Applications that could violate our core values must be regulated and, if necessary, prohibited. Particularly, the right to equal treatment and privacy must be rigorously protected in the age of AI. As the founder of AI governance software Trail, my team and I work every day to implement trustworthy AI. Practiced AI governance enables the innovation of Human AI and holds significant relevance in both industry and academia."

# Clear Responsibilities

# Armin Kurrle

Head of AI Program Porsche

"For me, Human AI means a harmonious interaction between humans and artificial intelligence, where technology enhances our abilities, helps us make better decisions, relieves us from repetitive tasks, and facilitates communication and information generation. Human AI requires a human-centered approach, with a focus on ethical considerations and clearly defined responsibilities. It is crucial that AI systems are safe, transparent, comprehensible, non-discriminatory, and protect human privacy in order to earn the trust and acceptance of users."

# Trustworthy Systems

Frauke Goll Managing Director appliedAl Institute for Europe gGmbH "Philosophers and scientists have often asked: What defines us as humans? Complex cognitive abilities, morality, ethics, self-reflection, and spoken language are often cited. For me, two additional aspects are crucial: interaction and the assumption of responsibility. In terms of Human AI, this means understanding AI as a tool, developing robust and Trustworthy AI systems, ensuring responsible use, and shaping human-machine interaction. There are still many open questions and challenges, but I am confident that we can address them by pooling our strengths, collaborating across disciplines, and fostering digital sovereignty in the public sphere. The appliedAI Institute for Europe aims to generate and disseminate high-quality knowledge on Trustworthy AI. We are building an open-access accelerator, collaboratively shaping a future we want to live in." O



# What Provides the Framework

# Use Case Never St01 Improving

Sladjana Schmidt from appliedAI advocates for a methodical, holistic approach to successful AI applications – from technical and economic feasibility to regulatory considerations and effective change management.

rtificial intelligence is transforming nearly all areas of the economy. Many companies recognize the potential of AI to optimize processes, reduce costs, and develop innovative products. However, not every AI use case leads to success. A structured approach helps to identify, prioritize, and implement use cases that deliver real value, rather than becoming mere technological novelties.

One of the greatest challenges is realistically assessing the significance of AI for one's own company. Often, there is a lack of shared understanding of AI among leadership, including an honest assessment of the current knowledge level and AI maturity across all relevant areas within the organization. Based on our experience at appliedAI, an organization's AI maturity is one of the decisive factors for evaluating the feasibility and value of use cases. The following criteria are essential:

# BUSINESS RELEVANCE AND MEASURABLE IMPACT

The use case should pursue clear, measurable objectives aligned with company goals, such as cost savings, efficiency improvements, revenue growth, or enhanced customer satisfaction. Goals must be defined so that success can be evaluated objectively. Without this clarity, an AI project risks getting stuck in the conception or prototype phase, or failing to deliver noticeable effects after implementation.

#### DATA AVAILABILITY AND QUALITY

High-quality data in sufficient quantity is the founda-

tion of any AI application. The data must be clean, consistent, and relevant to the task at hand. Gaps or biases in data can lead to inaccurate or irrelevant results from AI models. Data preparation is often a critical and time-consuming success factor.

#### ECONOMIC AND TECHNICAL FEASIBILITY

Implementation must be achievable within the budget and technological infrastructure. The benefits should justify the effort in the short or medium term. Decision-makers should clarify which investments are strategic for the future (e.g., cloud infrastructure) and which must provide a return on investment (e.g., process optimization). Companies at the start of digital transformation usually need to invest more.

# MANAGEMENT SUPPORT AND CULTURAL ACCEPTANCE

Management support and resource allocation are crucial for success, and the organization must be willing to embrace change. Employee acceptance, the "last mile," is essential. A use case adds value only if it is actually used, forming a closed loop that provides performance feedback.

#### SCALABILITY AND SUSTAINABILITY

A successful AI use case should function beyond a limited scope and be scalable if needed. It must also be sustainable without excessive costs that outweigh the benefits. Ideally, use cases are designed for scalability from the outset, rather than being optimized only later.

#### COMPLIANT AND TRUSTWORTHY AI

Use cases must be evaluated according to the EU AI Act's risk categories and meet the specific requirements of their risk class. They should also align with the company's internal policies and values. However, compliance does not automatically mean trustworthiness. Internal policies based on corporate values govern usage, accountability, and impact on customers and employees.

#### STRATEGY AND VISION

Companies should view AI as an integral part of their business strategy with clearly defined goals. A comprehensive AI strategy includes three elements: an AI vision, a portfolio of relevant, prioritized use cases, and a strategy for supporting factors such as data, infrastructure, ecosystems, partnerships, talent, and organizational structure.

#### DATA MANAGEMENT AND INTEGRATION

Data is often stored in silos, unstructured, or in different formats. Companies must invest in robust data management solutions and, if necessary, adapt their existing IT infrastructures.

#### **TRUST IN AI SYSTEMS**

AI is often perceived as a "black box" whose decisions are not always transparent. This can lead to resistance among employees. Companies must invest in training employees and ensure ongoing communication.

#### COSTS AND ROI

AI implementation often involves high costs. Companies need to clearly quantify the ROI of their AI investments and ensure that benefits outweigh costs. Top decision-makers must understand AI's impact and value or establish a dedicated position for AI transformation at the highest management level.

#### LACK OF INTERNAL EXPERTISE

The lack of qualified professionals is a significant problem. Companies need to invest in employee training and create attractive conditions to attract and retain skilled talent. Collaborations with expert companies, universities, and research institutions can help.

# DATA PRIVACY, EU AI ACT, AND ETHICAL ASPECTS

Companies must design AI projects to meet regulatory requirements regarding security, privacy, and ethical values. Depending on the risk class of use cases, they must fulfill the appropriate governance requirements. Acting early minimizes risks and strengthens their position as responsible players.

# CORPORATE CULTURE AND CHANGE MANAGEMENT

Introducing AI technologies often requires fundamental changes in how a company operates. Effective change management is needed to involve employees early and reduce fears.

#### A KEY MESSAGE: NEVER STOP IMPROVING!

Good use cases are never truly complete. Through continuous development, organizations can unlock the benefits of AI – and there is no shortage of examples to follow.



A successful AI use case should not only work within a limited scope but also be scalable when needed."

Sladjana Schmidt is Head of Partner Interaction at appliedAI.

# AI IN GERMANY

Germany is renowned for its strong research and development capabilities, with leading universities, research institutes, and innovative companies in the AI sector. While we see considerable use of AI in industry, we still lag behind the U.S. and China in commercialization. Contributing factors include a more conservative corporate culture, a lack of venture capital, and regulatory uncertainties. Data privacy regulations and the AI Act play a significant role in promoting responsible AI development, though they do slow the pace compared to less regulated countries. Nonetheless, "AI made in Europe" offers a genuine opportunity to establish trustworthy AI as a quality label. In the latest ManpowerGroup labor market barometer, 1,050 German companies were surveyed on their use of AI. Although 39 percent are already using AI, Germany lags behind internationally. High investment costs (32 percent), data privacy concerns (37 percent), and a shortage of AI experts (31 percent) are cited as the biggest obstacles. Globally, 48 percent of companies have already implemented AI, including generative AI.

According to the appliedAl Institute, the number of German Al start-ups increased by 35 percent in 2024 compared to the previous year but fell short of the previous year's growth rate of 67 percent. Additionally, 49 percent of the 41 start-ups that are no longer active in the German Al landscape have relocated their headquarters abroad, mostly to the U.S. In 2023, German start-ups received a total of \$1.2 billion in funding, while a single U.S. start-up received more than five times that amount in the same year!

The WIPO (World Intellectual Property Organization) patent report shows that China leads in generative AI patents, with over 38,000 patent families, followed by the U.S. and other countries. Germany ranks seventh, with 708 patent families. Bosch and Siemens are noted as prominent research companies in generative AI outside the top 10. O



Aimee van Wynsberghe is a Professor of Applied Ethics of Artificial Intelligence at the University of Bonn.

# <sup>Sustainability\_</sup> "We Need To Prioritize Responsibility"

The philosopher Aimee van Wynsberghe advocates for sustainable AI development that considers social and environmental impacts.

#### What is sustainability in the AI context?

Aimée van Wynsberghe: Sustainability typically involves three main areas: concern for environmental, social, and economic consequences. When discussing sustainable AI, I highlight two key branches. The first is using AI for sustainability, such as applying AI to tackle the climate crisis or to achieve the UN Sustainable Development Goals. This is promising. However, the second branch, the sustainability of AI, is just as critical. It focuses on the environmental resources needed to build and maintain AI infrastructure.

#### Where are we now with these aspects?

For AI for sustainability, there are numerous applications, and major tech companies are actively involved. However, the sustainability of AI is under-researched and poorly understood, requiring urgent attention and regulation to address its environmental impact.

# How can we raise awareness of this complexity?

People often view the cloud or algorithms as abstract, ignoring the physical infrastructure behind them. The first step is recognizing AI's tangible impact and asking critical questions: Where do materials come from? How do we recycle or replace AI infrastructure? Much electronic waste ends up in distant countries, releasing toxins that harm local communities and their access to clean water and agriculture.

#### Raising awareness is the first step.

Then, research is needed to assess the scale of the problem. Tech companies should investigate the entire AI lifecycle, while academics should study electronic waste. Finally, regulations are crucial to address concerns. Achieving sustainable AI requires transforming the entire lifecycle, including the politics and

economics driving it – not just maintaining the status quo.

#### What mitigations are necessary?

At a minimum, we need to regulate working conditions in mining. For electronic waste, clear guidelines on disposal are essential, and we could even limit how often physical infrastructure is updated to reduce plastic and electronic waste. It's hard to quantify how much waste AI generates versus general digitalization, but AI is part of it. To pursue a sustainable future, we must address both AI and digitalization together. Companies making and using AI should take responsibility for their waste impact.

#### How do companies react to this?

It varies. Most focus on energy consumption and carbon emissions, often through clean energy use. But there are positive examples like Fairphone, a Dutch company that sourced gold more sustainably and designed replaceable smartphone parts to reduce electronic waste. We need more companies to innovate sustainably and make sustainability central to their processes.

#### **Does AI contribute to global inequality?** Absolutely. While tools like GPT make tasks easier for a minority, those extracting the minerals for AI technology

don't benefit. Workers in mines risk their health for luxuries enjoyed by a small portion of the population.

# Women often bear the brunt of these costs.

Yes, especially in places like Ghana, where women are disproportionately affected by environmental damage from mining. Contaminated water sources force women to travel farther for clean water, limiting their time for education or career growth, especially in fields like Al.

# Is this a call for greater responsibility from individuals and tech companies?

Yes, it's a call for humanity, for individuals and tech companies, to take responsibility. Similar to the fair trade movement, where consumers support ethical practices, we need AI to prioritize responsibility toward the planet and people. Unlike fair trade, I don't want AI to have a "cheap alternative"; all AI should be produced with its environmental and social impacts in mind. What needs to happen for AI to be truly empowering? For AI to be empowering, we need to expand access to the resources needed to develop and use it. AI-powered healthcare could be life-changing in remote areas, but we must apply it cautiously. Biases in AI systems could repeat past mistakes, like pharmaceuticals tested mainly on men. AI must help underserved communities reliably and fairly, without flaws.

# True innovation benefits society."

# Is your vision of sustainability tied to the broader idea of the good life?

Absolutely. Sustainable AI is linked to rethinking innovation. Many believe ethics hinders progress, but true innovation benefits society without harming the planet, ensuring future generations can thrive too.

#### Do you see innovation as something that should be more prudent, in an Aristotelian sense of practical wisdom?

Yes, exactly. Innovation should embody practical prudence, aiming to improve lives without compromising others or future generations. Currently, much of our access to AI, like ChatGPT, comes at a cost – environmental degradation and resource depletion affecting vulnerable communities. This approach isn't sustainable or the kind of innovation we should pursue.

# Should our vision of flourishing avoid harming others now and in the future?

Exactly. We need to learn from other ethical traditions, like Ubuntu from Sub-Saharan Africa, which emphasizes community over individualism. In Ubuntu, "I am because we are," meaning flourishing is about the whole community, including future generations, not just the individual. O

# Context

Responsible Use of AI Requires Adapting Universal Principles to the Specific Application Context.



Tim Roder, in charge of Business Development at IPAI, focuses on expanding the IPAI community.



Carolin Rehder is responsible for Member & Community at IPAI. With her team, she supports companies in their AI transformation.



Exchange



When it comes to defining what Human Al means in practice, one thing is clear to us at IPAI: the answer heavily depends on the context. The requirements for trustworthy Human AI in the automotive industry, for example, differ from those in healthcare, banking, or food production. In highly regulated areas like finance or healthcare, data protection, non-discrimination, and transparency are paramount. In other fields, such as robotics or industrial automation, efficiency and reliability are the main priorities. For customer support, accurate responses are crucial, while for medical support, trustworthiness and diagnostic precision are essential. In the case of humanoid robots in caregiving, we expect not only technical reliability but also an emotionally engaging interface.

Human AI that places people at the center must therefore consider a wide range of needs and conditions and always ask the question of the context in which it will be applied. To gain a comprehensive understanding of our members' unique challenges, IPAI emphasizes industry diversity and a diverse community – from AI beginners to experts, SMEs to corporations, and from the public sector to the automotive industry. Together with our members, we aim to determine which principles, values, and standards are particularly

## Cross-industry exchanges lead to innovative approaches that may never have been realized within a single industry."

relevant in their specific contexts to develop methods and solutions that meet their application demands.

AI can contribute to a better life, for instance, by supporting the Al-driven management of energy systems to reduce CO emissions or by automating public services. However, what constitutes a "good life" for people also depends greatly on the context of the application. Socio-cultural differences and regional specifics also play a role in how AI can positively impact our lives. The importance of context is reflected in the EU AI Act, which acknowledges through its risk classification that different application fields carry different risks, and thus, principles must be adapted according to context.

#### Despite differences across fields of application, many universal challenges arise in the AI transformation. Topics

like data privacy, non-discrimination, and the explainability of AI decisions are relevant across industries. This is why it is essential to address these challenges collectively – to understand what requires a specific approach and where cross-company and cross-industry collaboration is possible. Innovation thrives where people can exchange ideas and learn from one another. For this, an environment based on trust and openness is essential. Often, cross-industry exchanges lead to innovative approaches that may never have been realized within a single sector.

Our role at IPAI is to bring together companies from different industries and build a community where everyone can benefit from each other's experiences and knowledge to achieve their goals more effectively. The diversity of our community, in particular, opens up new perspectives.

This isn't about exchanging intellectual property but rather about identifying possible applications, addressing data privacy, data structure, regulatory issues, and implementing cultural change within companies. These are fundamental topics that affect many companies. We are convinced that true progress can only be achieved through collaboration and synergy – regardless the specific context. O TEXT by Carolin Rehder, Tim Roder

# Lutomation Corasping and Comprehending

The industry is facing new challenges, not only due to a shortage of skilled workers. Learn how SCHUNK, a leader in gripping technology and automation, leverages AI to make its products smarter – and to revolutionize industrial processes.

robotic arm swings over a container filled with connectors, positions itself, and slowly lowers. Gently but firmly, the gripper closes around one of the components, lifts it out, and transports it to a plastic box. Carefully, it drops the connector into one of the compartments, then lifts and returns to the other container to repeat the cycle. What's unique about this process: the system is not simply executing a program; rather, it has "understood" what needs to be done – how to grasp and place each component according to its position and shape.

Behind this is an innovative AI solution from SCHUNK, the technology pioneer in clamping, gripping, and automation technology. Founded in 1945 as a family business initially focused on contract manufacturing, SCHUNK has grown into a technology leader in automation solutions, employing 3,700 people across 50 countries.

The "2D Grasping Kit" is an intelligent application that combines grippers, image processing, and AI. It's designed to handle various unsorted objects, where traditional automation solutions often fall short. For a robot, grasping is a complex task requiring learning and flexibility. Manually programmed systems struggle with randomly arranged, differently shaped objects or varying lighting conditions. This is where AI-powered image processing and machine learning come into play.

An AI-driven system like SCHUNK'S 2D Grasping Kit can recognize objects in different shapes, sizes, and positions – even in complex, changing environments. The system identifies optimal gripping points and sends the data to the robot, which then performs the corresponding movement. The system learns from every single interaction, starting with input images of the object to be grasped, followed by a brief training phase, after which it fully automates the gripping process.

The main advantage for customers: they no longer need to manually preconfigure the robot to handle specific parts. This enables even smaller companies to automate complex "pickand-place" tasks – grabbing an object at one location and placing it in another, a common application in industrial manufac-

turing and logistics. This relieves employees from repetitive tasks, increases efficiency, and improves quality.

The evolution of automation spans from mechanical and mechatronic devices to digitally networked devices and now to self-learning processes that adapt autonomously to new situations and requirements.

Industrial process automation today faces new challenges. Above all, the shortage of skilled workers and the growing demand for flexible production solutions are major concerns for many companies. It's about productivity, output, and failure rates.

Innovative automation solutions are also part of the "Industry 4.0" vision – connecting intelligent technologies with the physical world. "Digitalization will continue to develop in the future, increasingly merging physical products with digital services," says Timo Gessmann, Chief Technology Officer at SCHUNK.

From the mechanical systems of the early days to the simulation of industrial processes, SCHUNK brings this wealth of experience from the heart of German industry into the IPAI ecosystem. It's the understanding that industrial production is more than just the hum and clatter of machines. It requires intelligence and an understanding of the physical world – grasping, after all, is also about comprehending.

TEXT by Thomas Vašek

The system learns from every single interaction.




## "Transparency is Key"

From machine builder to AI pioneer: SCHUNK Technology Manager Martin May discusses intelligent products and a culture of lived innovation.

## Martin May, what are the main AI application areas you see at SCHUNK?

SCHUNK components are involved in many manufacturing processes. As a technology pioneer, we have been deeply engaged with digitalization for many years, and we incorporate this experience into our increasingly smarter components and services. Al plays a central role in this.

#### How do you specifically use AI?

We are gradually implementing generative AI in all areas: our products are becoming smarter, and our customers more productive. We're also enhancing customer interaction to simplify the integration and handling of our products. Internally, we use AI to increase efficiency in our own processes. With SCHUNK's proprietary GPT, we can apply AI in a protected environment, drawing on our accumulated knowledge. For us, trustworthy AI means secure data, which is why we rely on internal solutions.

#### How do your customers benefit from Albased products?

Al makes it easier to automate processes. Al-based systems can adapt more quickly to changing production requirements. In gripping processes, for instance, they enable the handling of various unsorted objects. They can also monitor process stability and detect problems early on. Our smart toolholder, iTEND02, analyzes vibration data in machining processes, indicating when a process is stable or when a tool change is needed. This helps our customers reduce waste, save resources, and make their production more sustainable. What challenges do you see in implementing AI?

The biggest challenge is cultural change. It's not enough to just introduce the technology; we must prepare employees for the shift and actively involve them. We also promote this culture of innovation externally, as in the IPAI network, where we can develop concrete AI applications faster in partnership. By actively co-designing AI solutions, we build trust among our customers and employees and present ourselves as an innovative employer.

## What guiding principles do you follow in the transition to a more AI-driven company?

Al will permeate all areas and transform all industries – including ours. The potential applications are diverse, and in the long term, companies can only remain successful if they engage with Al. It's important to us to understand and master the technology thoroughly, to use it responsibly and meaningfully. That's why we're taking the lead and collaboratively exploring relevant applications.

## How do your employees respond to these changes?

Transparency is crucial: from the start, we involved all employees in the development of "SCHUNK GPT," with small teams testing it before wider implementation. At network events like Tech Talks or Hackathons, we encourage our employees to stay curious and explore possible applications. Initially, there was some hesitation, but thanks to our culture of innovation, many are now recognizing the benefits. We overcome resistance with openness and "doing."

#### What's the challenge here?

Mechanical engineering is a highly model-based, conservative field. Shifting to data-driven methods requires a mindset shift, but the quality of the results is convincing. Both approaches will coexist, as physics remains unchanged, but data-driven solutions offer flexibility and efficiency.

### Do you use AI at higher management levels as well?

Yes, we use AI to analyze product data, customer feedback, and log files to make predictions about how we can better serve customers. AI supports us in decision-making, text and translation review, and customer communication. It now permeates many areas of the company. Are there limits to implementing innovations?

We can't implement every idea and innovation immediately; we focus on innovations that deliver value – ecologically, economically, or socially. O

Martin May is Director of Technology & Innovation Management at SCHUNK.

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## Sustainably Creative

The Mittelstand-Digital Center Franken combines AI and sustainability – seeking regional solutions for global challenges.

The connection between AI and sustainability is not only ethically imperative but also strategically essential. AI can

create sustainable solutions that go beyond mere economic value creation. It is crucial, however, to ensure that its use does not create new problems. A central principle of our work at the Mittelstand-Digital Center is the "Twin Transition"—the simultaneous pursuit of digital and sustainable transformation. Many companies separate these areas, even though they offer enormous synergies when combined. AI can optimize processes, reduce energy consumption, and foster sustainable business models, while also needing to remain sustainable itself.

An example of this synergy is the use of Al in resource management. Al helps companies reduce CO emissions by analyzing data, identifying patterns, and optimizing processes to lower resource consumption. However, it's essential that the technology used is also resource-efficient. We must avoid the trap of using Al that consumes more energy than it saves.

Sustainability and AI can only be successfully combined in a creative, hands-

on environment. That's why we have established labs where AI and sustainability come to life. In our DataLab, companies and students test sustainable technologies, while our RoboticLab combines high-tech with natural materials like wood to strike a balance between technology and nature. These learning spaces are designed flexibly to adapt to users' needs and to be continually reconfigured. We aim to foster creativity and invite exploration of new ideas. This flexibility is also essential for handling sustainability and AI because sustainable innovations often arise when people dare to steop off familiar paths.

We raise companies' awareness of the ethical implications of their actions, especially the potential negative impacts of AI on sustainability. This includes critically examining energy-intensive AI models like large language models and finding sustainable alternatives. An example of responsible AI use is promoting a circular economy. In collaboration with a textile start-up, we explored how AI can enhance the circularity of materials, conserving resources and reducing waste. Sustainability is not only a technical challenge but also a cultural one. It's about creating a sense of responsibility and community. A key part of our work at the Mittelstand-Digital Center is the "AI Round Table," which fosters exchange between academia and industry. Here, participants share experiences and jointly develop technologically sustainable solutions.

Our focus is on Franken, but our vision is global. SMEs face universal challenges, yet the solutions must be rooted regionally. In rural areas like Franken, we rely on straightforward language and tangible solutions, supported by direct communication and local networks. Our goal is to make Baden-Württemberg, Germany, and Europe leaders in ethically responsible AI use worldwide. Through learning and experimentation spaces, we build trust in AI, enabling it to deliver economic, social, and environmental benefits while contributing to a sustainable future. O

Yvonne Wetsch is the Project Manager of the Mittelstand-Digital Center Franken.

## Security\_ "Humans Hold Responsibility"

The use of AI in handling sensitive data presents a unique challenge – Thomas Berger, Police Chief of the State of Baden-Württemberg, and Frank Hönes, Digital and Risk Management expert at Landesbank Baden-Württemberg (LBBW), discuss their experiences.

# **Contract of the second second**

Frank Hönes

Thomas Berger, how is the Baden-Württemberg police currently using AI, and what have your experiences been? Thomas Berger\_ AI is still in its early stages for us, primarily due to strict legal requirements. Currently, we use AI in two areas. First, we employ language models to ease administrative tasks, and second, we use AI tools for mass data analysis, particularly in investigations. For example, we analyze video data in connection with child pornography. AI can help us make our work more efficient, but there are still many hurdles, especially regarding data protection and data integrity.

*Frank Hönes*\_ We approach AI with caution as well. Our initial goal was to prepare employees for AI tools. We developed an internal ChatGPT tool within a secure environment to ensure no data is leaked externally. Training programs help employees use it safely. The next step is to equip the tool with LBBW-specific knowledge. We're also testing AI tools in security monitoring to detect anomalies more quickly and improve process efficiency.

#### Both the police and the bank handle sensitive data. Frank Hönes, what are the specific challenges you encounter in your field?

*Frank Hönes*\_ Data protection and data integrity are paramount for us, too. Al tools must be treated like new employees, carefully trained and supervised. A central challenge is determining which data an Al is allowed to store and process. We must ensure that sensitive information isn't exposed, as this could have legal consequences and damage our reputation. That's why we prioritize regular training and simulations to maintain system integrity and strengthen customer trust.

Thomas Berger\_ The line is clear: no data may leave our authorized systems. Additionally, the information provided by AI must be objective and verifiable. For me, it's crucial that ethical, moral, and legal decisions are always made by a human. No AI should infringe on fundamental rights. People in Baden-Württemberg must be able to trust that there's a human behind police decisions. We also need to ensure that the data AI relies on is reliable and that results are checked with sound human judgment. Ultimately, responsibility must always rest with a human.

## Trust is a significant factor for both the police and the bank. How do you build trust in the use of AI?

*Frank Hönes*\_Trust is built through methodological and procedural safeguards. Our AI never acts independently; a human is always involved. For example, AI alone never determines a customer's creditworthiness. The AI provides data that humans then evaluate. Our experience helps us recognize pitfalls and strengthen trust. We also continually improve our systems and prioritize transparent communication. *Thomas Berger*\_I agree with Mr. Hönes. Trust is built through social interaction, supported by AI. The human factor is crucial, especially when analyzing large data sets. Often, humans are needed to properly assess situations. AI can assist us in forensic work, but ultimately, decisions must always be made by a human who reviews and evaluates the AI's findings.

#### Predictive policing, or predicting future crimes, is a controversial topic in policing. What are your thoughts?

Thomas Berger\_ Predictive policing, or predicting future crimes based on data, is very sensitive. A fictional example is the film "Minority Report", where crimes are prevented before they occur. In reality, however, such an approach would undermine public trust in the state. Another issue is that AI is only as reliable as the data it uses. If that data is flawed, inaccurate predictions could exacerbate societal tensions. Therefore, we need to



Frank Hönes heads Non-Financial Risk Management at Landesbank Baden-Württemberg. Thomas Berger leads the Department of Technology, Logistics, and Service for the Police of the State of Baden-Württemberg.

be very cautious when considering AI for such applications.

*Frank Hönes*\_ In banking, it's simpler. We use simulations and stress tests to play out various scenarios and test our systems' resilience. We're working with general data that we could analyze without AI, but we need predictive analyses to ensure we're prepared for all possibilities.

## What organizational changes does the implementation of AI bring?

*Frank Hönes* We see AI as an opportunity, especially given demographic changes and labor shortages. Tasks like analyzing large data sets can become more efficient with AI. It's not about adapting our organization to AI but using it to make processes safer and more reliable. An example is using AI in security monitoring to analyze vast amounts of data in real-time and respond to potential threats. Yet even here, the final decision remains with a human.

*Thomas Berger\_* Policing is a social profession centered on human interaction, which AI cannot replace. However, we need to establish standards to ensure efficiency and consistent quality. Traditionally, police work has followed a caseworker model, where each officer makes decisions based on their judgment. With AI, this is changing. The goal is to create standards that allow us to harness AI's efficiency without compromising the autonomy of our staff.

#### What do you expect from the collaboration with IPAI?

Frank Hönes\_ We see two key aspects: learning from others and learning with others. Collaboration with academia, industry, and the public sector offers us the chance to evolve further. We also aim to strengthen the economy and ensure we remain competitive globally. Thomas Berger\_ We were one of the first members at IPAI and are convinced that digitalization and AI will revolutionize society. We want to learn from others, bring in our challenges, and find solutions together. It's also about creating a counterbalance to large foreign companies. In Europe and in Germany, especially in the Southwest, we need to establish this counterbalance. 🔾

## **CERN for AI!** Europe needs a joint strategic project to align the interests of research and industry.



Professor Philipp Slusallek is the Scientific Director at the German Research Center for Artificial Intelligence (DFKI).

According to a recent report from the European Court of Auditors, Europe has fallen further behind in the global AI race compared to five or six years ago. Despite a strong foundation in scientific publications and research, the potential remains untapped, as projects are often conducted in isolation without a strategic focus. European research is marked by numerous small, incremental projects. What's missing is a common strategic objective.

Without large-scale, strategic "moonshot" projects, we risk losing many of our brightest young talents to exciting projects led by Google, Amazon, and OpenAI in the U.S., which offer an allure that small European projects cannot match. We could, however, learn from other fields: the physics community, with CERN, has successfully identified and collectively pursued common challenges and opportunities. Ambitious initiatives like this allow for the formulation of a clear vision, retention of talent, and gathering of top minds at the forefront of research. A European counterpart to these grand projects could motivate the next generation of scientists, promote cutting-edge research, and ensure Europe's long-term competitiveness in AI. Projects like the James Webb Space Telescope and the Square Kilometer Array illustrate how strategic large-scale initiatives can succeed when the scientific community rallies behind them. While these physics projects are important, one could argue that AI has an even greater impact on our society and economy. There is an urgent need to catch up with the U.S. and China. Europe needs a "CERN for AI" to unite the AI community, define strategic projects, and drive them forward in a coordinated effort. Such a center could make Europe's AI ambitions and excellence visibly impactful. The European commitment to quality, exemplified by "Made in Germany" in the automotive industry, should be extended to AI. However, like CERN, close connections with national and regional research are essential to ensure scalability. This is the only way to bring Europe's diverse industries together, collaboratively set goals, and secure the necessary structures and funding.

A push-and-pull model would be essential here, balancing the interests of research and industry. This requires new structures that facilitate close and scalable connections. At DFKI and IPAI, such structures are already being successfully implemented. The idea of a "CERN for AI" was first proposed at the OECD's inaugural AI conference in 2017 and has since been championed by CAIRNE (formerly CLAIRE) as a strategic objective. Unfortunately, the concept has repeatedly been stalled in political discussions. In her latest bid for re-election, Ursula von der Leyen highlighted this as a central goal for her new term. With substantial funding, this initiative could also become attractive to industry, facilitating the rapid transfer of results.

Research and industry must seize this opportunity quickly before the concept fails again. O

## **Under Scrutiny**

Quality testing can not only ensure regulatory compliance but also strengthen trust in AI systems.

As with any other software, the trust of companies and consumers in AI systems can be bolstered primarily through purpose-based testing. State-of-the-art testing of AI systems can be defined across several dimensions: fairness, autonomy & control, reliability, data protection, transparency, safety, and sustainability play key roles in risk-based testing of AI systems. The fairness of an AI system is mainly reflected in the data used for its training and testing, which must be balanced and representative to prevent biases and discrimination in real-world applications. For instance, in an AI system used in the financial sector for automated loan processing, representative and diverse datasets help ensure the system does not systematically disadvantage certain demographic groups. CertifAI's model for reliable AI development follows a fourstage approach, consisting of a robust development process, targeted risk analysis, Operational Design Domain (ODD)-based edge case tests, and statistical proof of error rates. Edge case testing examines the AI's reliability, particularly under extreme conditions like production errors or other exceptional scenarios in real-world operations.

A certification system for AI that has successfully passed these tests—especially high-risk systems—first and foremost provides an opportunity to build trust in AI. Independent testing confirms the system's compliance with specific legal or technical quality standards. A certification system and corresponding legal framework ensure that AI systems function reliably. Requiring AI systems to pass an independent quality test before market release results in more robust and market-ready systems.

Lastly, a certification system provides legal certainty for AI companies. By adhering to standards required for certification, developers, industry partners, and end-users can trust that systems comply with legal requirements, which in turn increases investment in AI development and fosters innovation.

Robert Kilian is the CEO of CertifAI, a provider of testing and certification for AI systems.



Globally, quality testing of AI systems, particularly high-risk AI systems, is now becoming legally mandated to prioritize product safety. The European legislator has also recognized the need for regulation. Since August 1, 2024, the AI Regulation (AI-VO) has been in effect as the world's first horizontal AI system regulation directly applicable in all EU member states. Companies offering high-risk AI systems are generally required to perform testing, which must be formally documented in a conformity assessment. Despite the regulation's binding nature, there is considerable flexibility for national legislators in areas like market supervision structure and measures to promote innovation.

To support innovation, independent AI sandboxes, or "regulatory sandboxes," are also intended to contribute to promoting innovation at the national level. These allow companies to develop and test their AI systems in a controlled environment, minimizing competitive disadvantages due to market supervision and thereby protecting innovation. O



## "Europe Needs to Regulation Become More INDEPENDENT"

The AI Act imposes high regulatory demands on companies. Andreas Liebl from appliedAI and Daniel Abbou from the German AI Association (KI-Bundesverband) discuss what this means for Europe's innovation and competitiveness.

## Andreas Liebl, Daniel Abbou – where do we currently stand on AI regulation?

Andreas Liebl\_ The EU AI Act has been passed, and the AI Office in Brussels is being established. Now, companies need to adapt their AI systems to these new regulatory requirements, despite a lack of clear standards. This is a significant challenge. Additionally, authorities like the Federal Network Agency lack specialized experts to monitor companies effectively.

Daniel Abbou\_ Absolutely. At the Al Association, we see a lot of uncertainty among our members, especially start-ups and scale-ups. They're wondering how to practically implement the Al Act. We hope the Al Act will be applied uniformly across all EU countries to strengthen Europe's competitiveness. Common best practices would be beneficial here. Andreas Liebl\_ We also need structured processes for quality and safety, similar to what we see in automotive production. This means regulatory compliance cannot fall solely on individual developers but must be ensured organizationally. *Daniel Abbou*\_This also includes employee training. Companies need to prepare their teams for the AI Act requirements – a process that should start immediately.

#### What are the main questions companies have regarding the AI Act?

Andreas Liebl\_ Many are asking which use cases are prohibited under the AI Act. They have only six months to adapt or remove affected applications. Some companies don't even know how many AI applications they're using or how to classify them. International regulatory differences add to the challenge. Daniel Abbou\_ That's an important point. Internationalization brings challenges, as companies face a patchwork of regulations. Slow approval processes are another issue. If authorities take years to make decisions, we lose valuable time. In a fast-paced field like AI, this can have severe consequences.

## What does the AI Act mean for Europe's innovation in AI?

Daniel Abbou\_ We need to find a balance between regulation and innovation support. Research and development must be promoted alongside regulation. Flexibility is needed so companies can respond quickly.

Andreas Liebl\_ IPAI and the actors based there, such as our appliedAI Institute for Europe, play an important role in this. Collaborations and shared best practices can help companies develop innovative AI systems that meet European standards.

#### How should European companies position themselves in the global AI race?

Andreas Liebl\_ Europe needs to become more independent. We need our own models and infrastructure. We cannot rely indefinitely on being supplied by major players from the U.S. or China. A unique strategy is essential for competitiveness.

Daniel Abbou\_ It's important that future





Daniel Abbou is Managing Director of the German AI Association (KI-Bundesverband)

Al systems aren't solely shaped by non-European values. Allowing that would mean losing not only technological but also societal control. Europe must be able to set its own standards and preserve our societal values in Al development.

#### Is the AI Act a disadvantage or a competitive edge for Europe?

Andreas Liebl\_ The AI Act sets higher standards for companies, but I don't necessarily see this as a weakness. By investing in high-quality, trustworthy AI systems, we could actually strengthen our position. We can turn regulatory requirements into a competitive advantage.

Daniel Abbou\_ Exactly. Regulation alone won't drive transformation, but it can serve as a catalyst. Many factors beyond regulation are essential. For instance, we must ensure adequate funding for AI start-ups. We need more than just venture capital; we need an environment where businesses are ready to adopt and implement AI products.

## What support do companies need for Al transformation?

Andreas Liebl\_ We need "ladders" to help companies climb over the regulatory "wall." This could include standards, tools, and practical services. For example, ensuring explainability in Al systems is a considerable effort. But if we develop proven best practices in collaboration with the EU Commission, companies can rely on these, saving time and resources. Daniel Abbou\_ Exactly. This type of support could come from organizations like IPAI or in collaboration with national partners like the AI Association. By working together and identifying the best methods, we can provide companies with a solid foundation, so they don't have to reinvent everything but can build on proven solutions.

#### What should the next steps be?

Andreas Liebl\_ We need to provide practical assistance. The EU Commission and national institutions should play an active role here. Ultimately, it's about enabling companies to not only meet requirements but also derive real value from them.

Daniel Abbou\_ Collaboration among regulators, companies, associations, and research institutions is essential. The AI Act can be a driver of innovation and quality if we approach it correctly. But this requires courage and a willingness to explore new paths. O Administration\_

## More Intelligent, More Efficient, More Democratic



Markus Richter is a State Secretary in the Federal Ministry of the Interior and Community and the Federal Government Commissioner for Information Technology.

Markus Richter, the "Federal CIO" and IT Commissioner of the German government with the rank of State Secretary, discusses the AI transformation of public administration—and the path to a citizen-friendly, more transparent state.

#### Markus Richter, what is the current state of AI transformation in the federal administration?

We are currently focused on two main areas: document logistics, where relatively simple bot systems classify documents for specific processes, and the identification of data in mass datasets, especially within security agencies. The major challenge now is to create a unified infrastructure and to emphasize end-to-end digitalization and full process automation. There are already many examples of AI use in governmen agencies.

What principles guide the use of AI? Artificial intelligence must follow the principles of value-based digitalization, as outlined in the Berlin Declaration. AI and digitalization should simplify people's lives. We aim to position ourselves for the future, manage crises better, and quickly gain data-driven insights for political decision-making.

How would you define "trustworthy Al" in this context?

Trustworthy AI must be, above all, transparent. It is crucial to clarify which data the AI accesses, how it was trained, and that its results are verifiable. Transparency of results is essential. There must be no automated administrative decisions that cannot be justified in terms of their reasoning.

## Which AI technologies are particularly relevant for public administration?

Bot systems are suitable for mass tasks that can be automated, relieving employees. I see great potential in large language models for knowledge management and decision support, with initial pilot projects already underway. Importantly, AI should serve as an assistant and not replace human decision-making. **Are public administration employees** 

#### allowed to use ChatGPT at work?

ChatGPT usage is limited due to privacy concerns. We are working on a customized version of another large language model for public administration that runs in secure environments. The hype around ChatGPT highlighted AI's potential and sparked political discussions. The challenge is to make such models secure and usable for public administration, where there is still work to be done. What is the federal government's stance on open-source solutions, and are there strategies to reduce reliance on proprietary providers?

Open source fosters competition and reduces dependencies. That's why we established the Center for Digital Sovereignty to integrate open source into public administration. It operates the Open CoDE platform and is developing Open Desk, an open-source work environment currently being piloted. The goal is to supplement proprietary systems with open solutions. Germany is recognized internationally as a leader in open source.

What does the EU AI Act mean for the use of AI in public administration?

The AI Act sets important standards for both administration and business. We are in the implementation phase, with risk analysis and transparency as key components. For example, we created a "Marketplace of Opportunities" to transparently display the use of AI in the federal administration, where ministries and agencies can find solutions tailored to their needs.

#### Does public administration have an easier time implementing the AI Act compared to companies?

Public administration serves as a significant driver for the economy by acting as a model in implementing regulations. It's often said that administration is cumbersome, but in reality, we have institutional roles that represent societal discussion processes. Data protection, for example, is an area where we establish standards through practical experience, serving as a role model. complex processes into simple language and making information easier to find. Al can help improve search functions and reduce errors. Without automation, we risk problems in providing essential state services in the long term, as the COVID crisis has shown. If the state cannot act timely and effectively, it risks losing legitimacy.

#### To what extent can AI transformation redefine or revitalize the concept of public service?

Al opens new possibilities, from the use of plain language to redesigning processes at the interface of administration, citizens, and businesses. The state can no longer handle challenges alone; it needs collaboration with society and industry. I am convinced that we need to expand this approach further.

#### Is AI transformation in public administration a democratic project?

Yes, if used correctly, AI can strengthen

## The administration should be more open to change."

## What AI skills do public administration employees need?

The discussion is often too one-sided, focusing only on digital skills. More important is the ability to adapt to change and see it as an opportunity. We need an open climate for experimentation and learning without fear of mistakes. The administration should be more open to change and less rulebound to allow for automation and harmonization of processes, especially at the local level.

## How can AI transformation contribute to making public administration more citizen-friendly?

Citizen-friendliness means translating

democracy. When people feel the state is absent, they turn away. Therefore, AI is a central tool in digital administration transformation to support democratic processes and facilitate communication. It offers the chance to make the state more intelligent, more efficient, and more democratic.

### What role does AI play in your daily work?

Currently, it doesn't play a central role. Of course, I engage with it in terms of content, but it's not as if my workplace is already fully integrated with AI. My job as a State Secretary involves a lot of personal communication. I still talk more with people than with ChatGPT. O

## Statements\_ Opportunities

Where, Based in Your Experience, Do You See the Biggest Challenges in AI Implementation? And Where Do You See the Greatest Opportunities?

## Significant Potential in Production and Logistics

#### Andreas Kühne

Program Manager Artificial Intelligence Audi

"Al offers significant potential for Audi's production and logistics to improve speed, sustainability, and quality. There are already concrete applications: in body construction, the analysis of resistance spot welding enhances both quality and efficiency, while automated label inspection in final assembly reduces workload and errors. However, there are challenges. Along with data availability and quality, model accuracy, and result interpretation, employee training plays a role. Moreover, EU regulations and ISO standards must be observed. Audi addresses these challenges through transparency, robust testing procedures, and continuous monitoring of established data streams and AI models. Development occurs in interdisciplinary teams, ensuring that diverse perspectives meet all legal and technical requirements. Audi is committed to responsible AI use through a statement of principles and invests in employee training, leveraging close collaboration with research institutions."

## New Interfaces

Bernd Bienzeisler Head of Research and Innovation Center for Cognitive Service Systems Fraunhofer IAO

"Our focus is on developing Al-driven service products, including forecasting, anomaly detection, and image processing. Additionally, we use Large Language Models (LLMs), RAG technologies, and agent systems to support innovation processes. LLMs offer the potential to create an entirely new interface between the abstract data world and human language. We believe that a 'human-centered Al' should meet three criteria: first, it must be powerful, optimally representing human cognitive abilities. Second, it must be explainable and understandable, allowing users to trace why certain decisions were made. However, current successful LLMs remain black boxes, and it's uncertain if the explainability issue can be resolved with current model architectures. Therefore, the third criterion is that humans retain decision-making responsibility, with users aware of risks such as hallucinations or misinformation."

## Trust through Understanding

#### Pit Ogermann

Senior Solution Architect Artificial Intelligence Bechtle

"Trust in AI emerges through understanding. This is something we've learned at Bechtle, particularly with the rollout of Microsoft Copilot for employees across several countries. From the start, it wasn't just about deploying technology but about enabling employees to use Copilot meaningfully. Through our 'Readiness Platform,' we established a central hub for assistance, alongside training programs like the 'Prompt Buddy' program and rankings of the best prompts to facilitate efficient use of the tool. A central exchange hub was crucial, allowing employees to quickly learn from one another. For our internally developed AI solutions, we increasingly rely on a 'Human in the Loop' approach, actively involving people in the training process. Our chatbot, Elisa, learns smartphone consultation directly from our experts, where AI suggests creative solutions that are then evaluated by our experts. Additionally, at Planet AI - a Bechtle investment - we also use specialized models for the IDA and LUNA solutions. While LUNA supports users in extracting qualitative insights from unstructured documents such as handwritten notes, IDA automates these insights and integrates them into existing processes. We are highly confident that both applications, with their proven practical benefits - above all, time savings and quality improvements - will lead to sustainable market success."

## Ecological Sustainability

#### Daniel Schmid

Chief Sustainability Officer SAP

"The AI interaction between humans and machines should be a duet, not a duel. SAP always considers the impact of AI on society and the economy. Our AI strategy is human-centered, with clear governance structures. As early as 2018, we defined AI principles and in 2019 we established an AI Ethics Council. 'Responsible AI' is one of the three pillars of our AI strategy. We've reinforced our commitment by integrating recommendations from the latest EU AI guidelines into the new version of our AI ethics policy. This includes principles such as human oversight, transparency, explainability, and sustainability, ensuring that humans retain supervision and final decision-making power. This approach safeguards human rights and supports long-term sustainable development, such as facilitating the calculation of carbon footprints. At the same time, the growing number of AI applications presents a scaling challenge. Shortly after idea formation, use cases are categorized according to the ethics policy. For high-risk cases, the AI Ethics Council makes the decision. Beyond opportunities for ecological sustainability, AI can also democratize access to knowledge. AI is relatively accessible, allowing people from diverse backgrounds and knowledge levels to benefit."

## Better Information, More Confidence

#### Hamdi Belhassen Co-Founder & CEO Caire

"Al is evolving at an astounding pace, bringing both risks and tremendous benefits when used correctly. Each Al is created with a specific mission. At Caire.ai, our mission is to deliver contactless vital signs measurement to the clinical sector. As a healthcare application, it is at the pinnacle of trustworthy Al and a responsibility that demands implementing rigorous standards. However, this level of rigor may not be necessary for all Al applications. The main challenge in creating Human Al lies in managing risks associated with extreme views on Al, which can hinder progress or increase dangers due to ignorance. Human Al doesn't always need to be a "black box Al" wrapped in security layers. Instead, each mission should be addressed individually, with risks clearly communicated and understood. Ultimately, engaging with Al that acknowledges its risks will nurture a more informed and confident generation, fostering sustainable technological progress."

## Support Rather Than Replace

#### Matthias Schneider

CEO Digital Services and IT fischer Group of Companies

"AI can improve the world and our lives, but only if we use it ethically, socially, and sustainably. The technology must support people in their abilities and work, rather than replace them. Equally important are low resource and energy consumption, security, and transparency. When we develop and implement AI with responsibility for people and the environment in mind, we can tackle the social and economic challenges of the coming decades. AI is the ultimate future technology to streamline and improve processes, address labor shortages, and maintain competitiveness. At fischer, we provide our employees with AI tools to enhance the performance and efficiency of our processes, find innovative ways to create value, and continually optimize our customer experiences. Additionally. we aim to advance research and application of AI, robotics, and digitalization in construction. We're expanding our offerings in areas like BIM (Building Information Modeling), automated construction with our BauBot construction robot, and connected fastening products within the Internet of Things. IPAI offers us the ideal platform and infrastructure to achieve these goals." O



## How We Learn



\_Co-Intelligence

## **Smarter Together**

To use AI productively within an organization, it's essential to combine the strengths of humans and machines.

hange propels us forward, keeps us alert. At first, we feel uncertain, even unsettled. Then we begin to explore new possibilities. That's the moment when learning begins. In the AI transformation, learning is the critical success factor. Increasingly, companies are experimenting with ChatGPT and other AI tools, testing their capabilities and limitations. The goal is to understand which tasks AI can support, which processes can be automated, and what challenges arise in the process.

Learning means acquiring knowledge and skills to act appropriately in different contexts. Unlike machines, we humans learn not only from data but also from social interactions and our experiences in the world. But how do we learn to collaborate productively with AI in an ethically responsible way? How can we create learning environments where humans and machines work together, each with their own strengths?

The American philosopher and educator John Dewey understood learning as an "inquiry," shaped by confronting and solving problems. For the pragmatist Dewey, learning involves identifying problems, formulating hypotheses, and experimenting to build knowledge. Learning happens through experience. You try something, make changes, and then observe the consequences. Dewey's approach to "inquiry" requires that learning is not passive but active, involving exploration and understanding of situations. This means dealing with real-world problems and gathering experience.

The same concept of inquiry applies to working with AI systems. It's about discovering how AI can be used productively in each context, identifying challenges, and understanding how processes change as a result. It all starts with a problem to solve – such as optimizing a process or improving customer support. Principles like responsibility or trust can provide guidance, for instance, in terms of fostering trustworthy customer relationships. The specific challenges and requirements are defined by each context. Based on this, hypotheses can be formulated – ideas about how AI can be effectively applied. Learning occurs through active experimentation and reflection on the insights gained: what mistakes happen, how do customers respond? This is how we eventually understand what principles like trust or responsibility mean in each specific context. For example, which tasks in customer support can be automated, and when human empathy is needed to build a trusting relationship.

AI has the potential to enhance human capabilities, allowing us to learn faster and tackle more complex tasks. At the same time, it can help compensate for human weaknesses. People are prone to cognitive biases, make mistakes, and are influenced by emotions and prejudices. Different people often make different decisions, even when given the same information. Psychologist Daniel Kahneman coined the term "noise" to describe these random deviations in human judgment. Unlike humans, AI systems never get tired, moody, or distracted. They can analyze vast amounts of data that would overwhelm us and often "see" patterns that humans cannot recognize. Thus, AI can help break down human biases, correct thinking errors, and eliminate "noise," as long as the AI itself is free from biases.

### The democratization of knowledge and skills could boost productivity."

The concept of "co-intelligence" describes how humans and Al can make smarter decisions together and learn from each other. At its core, it's about combining the strengths of AI with human strengths as productively as possible. U.S. innovation researcher Ethan Mollick distinguishes between "Centaurs" and "Cyborgs." Centaurs strictly separate tasks they handle themselves from those they delegate to AI, while Cyborgs work closely with AI, constantly shifting between their own actions and AI support. The most effective division of tasks depends on the specific context.

Collaborating with AI requires, and also enables, a deeper understanding of our own work. It's not just about understanding which tasks AI can solve better; it's also about considering whether we can ethically delegate a task entirely to AI. Principles can serve as a guide, but the answer can only be found through experimentation. Whether you're a Cyborg or a Centaur, co-intelligent collaboration with AI is a learning process – an "inquiry" in John Dewey's sense. Ultimately, we can measure its success by the outcomes. One thing is certain: AI systems will increasingly take on cognitively demanding tasks. MIT economist David Autor believes that AI will change the role of expertise. Its use in businesses could allow more people to perform tasks once reserved for highly skilled professionals, as some studies show. At the same time, companies can train AI systems with the expertise of experienced employees to retain knowledge within the organization and transfer it to new or less experienced colleagues. In times of skilled labor shortages, this can be vital for companies.

When everyone has access to expertise through AI, we must rethink our understanding of skills and competencies. The best employees of the future may not be the most highly trained but those who learn quickly to leverage AI's capabilities most effectively. Specialized expertise will become less important, while skills like critical thinking and teamwork will gain significance. Above all, employees need the ability to experiment productively and responsibly with AI systems. At the same time, despite AI support, it will be essential to avoid cognitive complacency and preserve our human judgment.

This democratization of knowledge and skills could significantly boost productivity. Companies that invest in training their employees and establish a culture of lifelong learning will benefit from the collaboration between humans and AI. Leaders play a key role here, fostering a learning culture that supports openness to new technologies and continuous development.

The core learning experience in the AI world is that humans and machines can learn from each other, becoming smarter together. This creates a radically new kind of learning organization – one that we, in turn, must understand anew. Collaboration with intelligent systems will ultimately demand a new kind of intelligence from us humans.

техт by Thomas Vašek



## "We Need to Rethink Our Learning Environments"

Organizational and learning expert Gianni Giacomelli on new architectures for collective intelligence.

## Gianni Giacomelli, what is learning today compared to the past?

Gianni Giacomelli: Learning is crucial for organizations to adapt to new challenges. Traditionally, it involved teachers, students, and books, but with today's rapid knowledge growth, these methods are outdated. Now, learning focuses on knowledge transfer, management, and collaboration, especially in fast-evolving fields like technology and law, such as Al's impact on intellectual property.

#### What skills will we need to teach people in the future to ensure they remain effective?

The most important skill is learning how to learn, starting with a specific subject before moving to a broader understanding. It's crucial to develop deep expertise in a few areas ("I-shaped" skills) and the ability to connect across disciplines ("T-shaped" skills), enabling structured thinking in various domains.

#### How does this approach to learning fit into the workplace context, especially with AI and automation?

There's a belief that AI will handle routine tasks, leaving humans with creativity and empathy. While partly true, it's misleading to think machines can't be creative or empathetic. AI has outperformed humans in generating business ideas and can simulate empathy in situations like patient care. The real question is how to combine Al's capabilities with human intelligence to enhance collective outcomes.

#### How should we think about collaboration between humans and machines in a collective intelligence environment? This collaboration seamlessly blends human creativity with Al's strengths. Success depends on understanding Al, automating where possible, and keeping humans involved for oversight. A key skill for employees is learning to work with machines to enhance their abilities. In the future, machines will play a larger role in learning, offering insights and asking questions, not just providing

#### Does this shift mean employees need to learn continuously rather than through traditional training programs?

answers.

Absolutely. We need to rethink learning environments entirely. The idea of attending a seminar and then going back to work is outdated. Instead, learning should happen in real time, in the flow of work. Machines can provide feedback on the spot. For example, after running a meeting, a tool could tell you that you spoke too much or didn't ask enough questions. This kind of continuous feedback enables constant learning, making employees more adaptable and efficient.

### How do managers fit into this new learning architecture?

Managers need to play a more active role as teachers and guides, helping employees identify skill gaps and providing real-time feedback. Unfortunately, many managers today are focused on KPIs and deadlines rather than fostering learning. This has to change. Managers must shift from overseeing work output to nurturing the development of their teams in this rapidly changing environment.

#### Do still need managers at all?

Yes, we will still need managers, but their role will evolve. They serve as the link between a company's strategy and its workforce. While machines assist, they can't handle all resource allocation and strategic decisions. Even with flatter structures, managers will remain key in guiding and supporting employees, especially as machines take on more coaching and feedback tasks. O

Gianni Giacomelli is Head of Design Innovation at the MIT Center for Collective Intelligence.

# Together

In the IPAI ecosystem, companies from different industries learn from each other: Fery Weber (Würth) and Hans Torben Löfflad (STACKIT) in dialogue.



Fery Weber is responsible for Big Data and Strategic Sales Management at Adolf Würth GmbH & Co. KG.

#### Cooperation



#### Fery Weber, Hans Torben Löfflad, how has the IPAI platform helped your companies collaborate on AI topics, and what specific opportunities do you see for advancing your AI projects?

*Fery Weber\_* The cooperative approach of IPAI has already yielded many successes. Each company contributes its strengths: Würth primarily in sales, others in production or finance. One particularly exciting development was the discussion around Large Language Models (LLMs), which led to the formation of a working group on the operational application of LLMs.

Hans Torben Löfflad\_ The exchange also

takes place through the Community Meetup, which we launched with Würth and SCHUNK and which continues to grow. We identify strengths and learn from each other. For example, the LLM working group has focused on parsing documents from PDFs, and a hackathon with experts has yielded valuable insights.

#### What commonalities do you see in the challenges and goals of your two companies, and how do you use the IPAI platform to tackle these challenges cooperatively?

Hans Torben Löfflad\_ A good example is the EU AI Act. We are preparing together by sharing new insights. Another critical issue is the skills shortage, especially in AI. Having employees in an ecosystem like IPAI where they can connect with like-minded professionals, exchange ideas, and grow through new challenges is a tremendous asset.

*Fery Weber\_* Another significant challenge is the development of new business models. Many companies are undergoing a transformation, and it's about staying competitive. The IPAI platform helps us pool our resources and progress more quickly.

How does the IPAI platform facilitate knowledge and best practice sharing across industries, and what specific benefits have you gained in your daily work?



Hans Torben Löfflad is Tech Lead AI Engineers at STACKIT GmbH & Co. KG.

*Fery Weber\_* The platform offers many formats that promote dialogue. For instance, we've established regular exchanges in sales with SCHUNK, which originated through the platform. Even informal conversations, like those over coffee, often bring surprising value. Exchanging ideas with colleagues from different industries generates fresh ideas that might not have been on our radar.

Hans Torben Löfflad\_ There is informal exchange, but also structured environments like Affinity Circles, where employees from different departments, such as legal or finance, come together. It's about creating new connections between companies. This exchange not only strengthens the companies themselves but also boosts the region's economic power through closer collaboration.

## Which formats of the IPAI platform have provided the greatest value for you?

Hans Torben Löfflad\_ Three key areas are decisive for me: the professional exchange among AI experts, the cross-functional exchange with other business areas affected by AI, like marketing or content creation, and contact with startups, which often provide innovative solutions. Fery Weber\_ The exchange with startups is particularly exciting, as their fresh ideas and technologies can be directly applied to process optimizations or new approaches. The platform fosters a sense of community that encourages us to think outside the box and find new ways to tackle challenges.

#### What role does the human factor play?

*Fery Weber\_* Human interaction is essential. The platform provides the space, but the members actively shape the exchange. This creates a spirit driven by people who are ready to grow together. Companies on the IPAI platform are curious and want to understand how AI works. This curiosity drives innovation.

Hans Torben Löfflad\_ It's about designing AI with European values. The concept of "Human AI" provides a clear direction: people remain the focus. The aim is to use AI in areas where it takes over repetitive tasks that don't fulfill us, creating space for work that truly enriches people.

#### In which areas have you developed solutions through collaboration on the IPAI platform that you couldn't have achieved alone?

Fery Weber\_ One example is the knowledge and learning model we developed with the IPAI platform and the AI Campus. Our employees can learn about AI and understand the "black box" of AI. We couldn't have achieved this quality and speed without the AI Campus's expertise.

Hans Torben Löfflad\_ We are currently working on a project to capture expert knowledge from skilled professionals and make it accessible to future generations. Our aging society often faces knowledge loss as experts retire. With AI, we aim to preserve and make this knowledge searchable.

#### So Würth could use this system to retain the knowledge of its field representatives?

*Fery Weber\_* Exactly. Field representatives, for example, could share their experiences and knowledge, which we analyze and pass on to new colleagues. Technical expertise could also be processed in a way that makes it accessible to all. Collaboration with IPAI and partners like Fraunhofer opens up entirely new possibilities.

## What are your long-term goals for collaboration on the IPAI platform?

Fery Weber\_ Würth wants to leverage the growing community at IPAI to exchange ideas with other companies on AI, learn from each other, and collaboratively develop innovative solutions for selected projects. What started as an idea is increasingly becoming reality. Hans Torben Löfflad\_ We not only want to integrate AI into our companies but also to promote a sovereign AI from Baden-Württemberg that gains global recognition. IPAI should serve as a beacon, demonstrating how to design AI aligned with human values.

### What do you enjoy most about the collaboration?

*Fery Weber\_* The spirit on the IPAI platform brings incredible energy to tackle new topics and move forward together. This exchange ensures that we don't fall behind in AI in Germany and Europe. *Hans Torben Löfflad\_* The people I meet on the IPAI platform are full of ideas and creativity, which makes me optimistic for the future. O



Intelligence\_

## "Intuition Is Often Superior"

Psychologist and risk researcher Gerd Gigerenzer on why our gut instinct is often right – and can work well with AI.

Photo Simply Rational

#### Gerd Gigerenzer, what is intuition?

Intuition is a form of unconscious intelligence based on experience. You immediately sense what to do, even if you can't explain why. A doctor who knows a patient well might sense that something is wrong without knowing exactly why. However, intuition alone isn't enough; it is often followed by conscious thinking, like diagnostic tests. Intuition and conscious thought aren't opponents – they both are necessary, each one incomplete without the other.

#### Why is intuition important to us?

If we had to make every decision in life consciously, we wouldn't survive long. Take, for instance, digestion or the immune system – these processes are unconscious. Intuition is especially helpful in situations that require quick decisions, like firefighting, sports, or the military. But even in situations where there's more time, intuition is often superior.

#### An example from your research?

In one experiment, we instructed experienced handball players to watch a video of a Bundesliga game for ten seconds, then pause it. They were asked to immediately decide what the player with the ball should do – the intuitive answer. They then had 45 seconds to analyze the scene further. Interestingly, some players changed their minds afterward. Yet, in most cases, the first, intuitive decision was best, and after time for reflection, a less effective option was often chosen.

#### But Daniel Kahneman and others have shown that intuition is often full of biases.

Many so-called cognitive biases only appear problematic if we use a model of the rational Homo economicus as our benchmark. Overconfidence, for instance, is generally seen as a flaw. However, overconfidence isn't inherently bad. Without this type of confidence, no one would take risks – Columbus wouldn't have sailed, startups wouldn't be founded. Often, overconfidence is necessary just to make progress.

## Intuition is especially helpful in situations that require quick decisions."

Gerd Gigerenzer

#### Why can't AI act intuitively?

Al is a correlation machine, learning through vast amounts of data. A neural network might need tens of thousands of images to reliably identify a giraffe. In contrast, a three-year-old child only needs to see a giraffe once or twice to understand what it is. Al lacks this conceptual understanding – it merely calculates pixel correlations.

## Can intuition and AI work together at all?

Absolutely, and they already do in many fields. Al excels at calculations and data analysis, but human intuition remains crucial, especially when data is incomplete or it's unclear why specific data is available. There's always a need for collaboration. It would be mistaken to think an Al could lead an entire company on its own. The future will involve a division of tasks.

### What role does intuition play in management?

Managers need both analytical thinking and intuition. An example from practice: an executive board faced a major decision. Three members were in favor, one had a bad gut feeling but couldn't explain it. In the end, the one with the gut feeling turned out to be right. You should listen to the most experienced person, even if they can't fully explain their intuition.

### Many managers hesitate to rely on their intuition. Why?

In public companies especially, managers are accountable, so they avoid admitting to intuitive decisions since they aren't always rationally explainable. Instead, they commission reports and hire consulting firms to justify decisions after the fact, shifting responsibility. This leads to unnecessary costs but, more importantly, lost time and a defensive culture that stifles innovation. How can one distinguish between intuition and prejudice?

#### Intuition isn't inherently linked to prejudice. Prejudice can just as easily emerge in conscious thought. An experienced manager who works closely with people should have fewer biases because they've learned to act intuitively. Of course, prejudice can play a role in intuition as well, but that's more a matter of experience. Intuition isn't inherently suspect.

## When does intuition fail for experienced people?

It can fail when the world has changed. A businessperson who has been successful for years might struggle when the landscape shifts, as with globalization or COVID-19. In these cases, previously successful intuition may no longer work because the basis for decisions has changed.

### What role does intuition play for you as a scientist?

Science is a balance of intuition and conscious thought. I need intuition to be innovative. Intuition helps generate new ideas. When I read an article or a paper, I often have a sense early on whether it's sound or not. That's experience that helps me work better. O

Gerd Gigerenzer is Director Emeritus at the Max Planck Institute for Human Development and leads the Harding Center for Risk Literacy at the University of Potsdam.

## Strategic Advantage of AI

Successful AI integration requires companies to undergo strategic realignment – and a cultural shift.

Since the launch of ChatGPT, artificial intelligence has become a focal point in numerous discussions. Several studies predict billions in economic potential, and prominent figures like Bill Gates have described AI as one of the most important technologies of our time. Despite the hype, the challenge remains to generate real value from AI initiatives. A recurring discrepancy is that while many companies implement AI, only a few can showcase significant successes. This indicates that simply introducing AI tools isn't enough– successful integration often requires profound strategic realignment and a cultural shift.

A fitting comparison is the introduction of electricity into industry over 100 years ago. Even then, it took a long time for companies to restructure their processes in a way that the new technologies led to noticeable productivity gains. The same applies to artificial intelligence today: AI needs to be embedded deeply into the business strategy rather than applied sporadically to create long-term value.

Al success largely depends on a company's size, agility, and culture. While smaller companies can respond to change more



Tristan Post is an AI consultant and co-founder of the AI Strategy Institute. He teaches AI and entrepreneurship at the Technical University of Munich. quickly due to their flexibility, larger companies often face the challenge of transforming established structures. Startups have the advantage of leveraging the latest technologies from the start to gain a competitive edge, whereas established companies often struggle with the "innovator's dilemma"– the fear of jeopardizing their existing business model.

A two-pronged approach is essential for successful AI integration:

#### THE BOTTOM-UP APPROACH

Many employees already use AI tools independently to optimize their workflows. This phenomenon, where employees introduce technology to the organization on their own, creates opportunities but also risks, especially regarding data security and governance. Therefore, clear frameworks must be established to enable the safe and efficient use of AI.

#### THE TOP-DOWN APPROACH

Simultaneously, leadership must recognize AI's strategic possibilities. This includes automating and optimizing processes and creating new AI-driven offerings that strengthen the company in the long term. Without clear leadership and an aligned strategy, AI remains an isolated technology with limited potential.

Another factor for successful AI integration is company culture. Organizations must create an environment where experimentation and mistakes are seen as necessary parts of the learning process. Some companies have implemented AI ambassadors and training programs to enable employees to handle the technology confidently. A culture that encourages openness to failure, along with training and initiatives to foster AI acceptance – this is the path to success. O

## I Speak, Therefore I Learn!

We need dynamic, interdisciplinary learning cultures across all organizational levels.

A SME owner recently asked me why AI skills were so important. Ultimately, he suggested, AI was just another software tool like Excel. Classical training should suffice, and application would naturally follow. It's not that simple. AI is a multifaceted technology with tremendous potential. There's generative AI, applied in everything from email composition to video production, and additional AI systems that process and analyze data to produce predictions, recommendations, or decisions. Across the entire value chain, AI systems hold potential for optimization and innovation. And we're still not fully clear about exactly where and how AI systems can be used to optimize and innovate.

#### We therefore need widespread AI competencies to:

- develop value-added applications from both bottom-up and top-down perspectives,
- · keep pace with AI's rapid development,
- interact "knowledgeably" with AI, with awareness of possible risks.

Al systems can sometimes appear inexplicable. Once trained, we may – depending on the model – no longer understand why the system made a particular decision. Discriminatory patterns may influence model development and could potentially be reproduced in Al-based decisions. It's essential to us to build not only socially acceptable but also socially responsible Al systems. This is a defining aspect of European Al development. The necessary Al competencies even find their place in Article 4 of the new EU Al Regulation.

Today, most of us use AI systems, either knowingly or unknowingly. Thus, a foundational understanding of the technology is required. AI isn't just for "techies"– everyone needs it. With accessible and well-prepared learning opportunities, even "non-techies" can feel empowered!

Considering application potentials and impacts on individuals and society, we need more than basic knowledge – an interdisciplinary depth of knowledge, specifically:

 Technical competencies for AI system development and oversight, Britta Leusing is Deputy Head of the AI Campus Office at the Stifterverband in Berlin.



- Methodological competencies for process design using AI, AI system application, and data usage and evaluation,
- Social competencies to identify ethical questions and communicate about AI systems,
- Personal competencies for a thoughtful, confident interaction with AI.

To develop and implement AI successfully, organizations need everyone at the table – from accountants to product developers to executive leadership. Given the complexity and speed of AI developments, we can only keep up by moving away from classical, compartmentalized learning (silo learning) toward a blend of learning opportunities. Formal education in schools, universities, and professional training must be supplemented by informal learning paths: through personal experimentation with AI, learning videos, online courses, and collaborative learning in so-called "peer" groups. These voluntary learning groups deepen their knowledge through discussion and apply it in practice.

Conversational learning – I speak, therefore I learn. The next technological innovation after AI is sure to come. Let's start today to build interdisciplinary, sustainable, and dynamic tech-learning cultures. That way, we'll also succeed in establishing an innovation ecosystem. O

Statements\_

## Insights

What Are the Lessons Learned from the AI Journey So Far?

## Empathy and AI as an Ensemble

#### Sven Jungmann

CEO Theta Diagnostics

"I am always surprised by how deeply rooted the belief is that AI and empathy are incompatible in healthcare. Many physicians fear that the integration of AI might erode the humanity in medicine – a view I find concerning. AI has the potential to enhance empathetic patient care, not replace it. It creates space for personal conversations and supports patients in making informed decisions. Yet, AI is often seen as a Trojan horse, undermining clinical autonomy and focusing solely on efficiency at the expense of humanity. It's not enough in product development to only engage with 'early adopters'; early dialogue with the broader clinical community is essential. This also includes promoting data and AI literacy in education and training. The future of healthcare depends on whether we can understand empathy and AI as two sides of the same coin."

## Innovation through Diversity

#### Corinna Gorges

Head of Digitalization, Schwarz Dienstleistungen

"The blend of various perspectives leads to the most effective innovations. Collaborating with experts across disciplines enables us to develop diverse solutions and execute projects efficiently. From the perspective of an ethical corporate culture, a responsible and human-centered approach to new technology is paramount to us. Artificial intelligence does not replace human creativity. It assists us in solving complex problems and automating repetitive processes. Only those who understand AI can leverage its opportunities and tackle its challenges. We are responsible for communicating information clearly and training colleagues - especially in handling sensitive data. Employees actively shape this transformation, which not only fosters acceptance but also builds trust. Together, we benefit from a multitude of approaches, future-proof our organization, and strengthen competitiveness."

## The Human F<mark>actor</mark>

Ninos Mirza IHK Heilbronn-Franken "My primary focus is on the digital transformation of businesses. As the head of the IHK AI Transfer Office at IPAI, I help companies gain access to innovative technologies. A core challenge in implementing human-centered AI is ensuring transparent processes and understandable decisions to build trust in AI systems. Clear guidelines and ethical standards are equally essential to guarantee responsible usage. Additionally, AI systems must be sustainably designed to provide long-term benefits. These technologies also offer significant opportunities. For example, with Retrieval-Augmented Generation (RAG), Large Language Models (LLMs) can strategically access external knowledge databases to filter and apply precise information. This can greatly improve processes and help companies make optimal use of available information. Ultimately, the human factor is crucial in digital transformation. Our mission at the IHK AI Transfer Office is to support this transition and make companies future-ready."

## Good Data Quality as a Foundation

#### Eric Martin

Head of AI ebm-papst

"One of the biggest challenges in implementing AI is ensuring its sustainable use. This means that AI applications shouldn't just shine briefly as prototypes or demonstrators within the company but should be deployed as reusable, productive systems. Achieving this requires a solid foundation, encompassing both the AI infrastructure and the underlying data infrastructure. Data quality and data governance are two essential prerequisites for AI success. The rapid pace of technological development brings both opportunities and challenges. On one hand, nearly free, powerful tools benefit all companies; on the other, organizations must learn to adapt to this new way of working. It's essential to continuously monitor which technologies are relevant for the company and how they can make work more agile. Especially within engineering companies, a cultural shift is on the horizon. It's promising that a prototype can be developed very quickly with AI, but this only becomes an advantage if one learns to fail fast and iterate."

## Spirit of Experimentation and Patience

#### Marion A. Weissenberger-Eibl

Head of the Fraunhofer Institute for Systems and Innovation Research ISI and Chair of Innovation and Technology Management at the Institute for Entrepreneurship, Technology Management, and Innovation at Karlsruhe Institute of Technology (KIT):

"Artificial intelligence makes us more innovative, faster, and more precise – if we allow it. More innovative, as AI helps us generate, develop, and test new ideas, supporting the entire innovation process. Faster, as AI enables us to automate repetitive tasks and tackle complex challenges more easily and efficiently. More precise, as AI can analyze vast datasets, allowing us to make evidence-based predictions and decisions. But, as often is the case, the tool is only as good as its users. To apply AI profitably, we need openness to new solutions, a spirit of experimentation, patience, and the right prompts. While the focus has traditionally been on finding the right answers to questions, going forward, it will be much more about asking the right questions that AI can help us answer."

## Data, Better AI

#### Jan Mittendorf

**Operational Director TUM Venture Labs** 

"As a mathematician now working in the venture capital field, I focus intensively on how startups developing AI can achieve success. One of the key insights on my AI journey is that the architecture of an AI model is rarely the decisive differentiator. Far more critical is the data: better data leads to more effective models. This is particularly important in the startup sector, where data is often scarce at the outset, making differentiation challenging. For AI projects to succeed, securing access to high-quality data is crucial, and it's essential to include not just ,human-made' data like text, images, or audio but also sensor data. A solid technical education combined with an ethical understanding is key to safe and human-centered AI development. Waiting is not an option - we must act proactively, or someone else will." O



## What Inspires Us

## Innovation\_

## **Perfectly** German?

Why we need a cultural shift for AI transformation - and why we should still rely on our traditional strengths.

magine a country on the cusp of transformation, with people everywhere driven by curiosity and initiative. Engineers, scientists, and entrepreneurs all work toward a shared vision: developing technologies that genuinely improve people's lives. Picture Germany taking a leading role in the field of AI over the coming years, one built on innovation, responsibility, and the deeply held belief that AI should serve the common good. In Germany, startups, established companies, and research institutions cooperate within an open innovation ecosystem where knowledge is shared, and collective achievements are celebrated. This results in AI-based solutions that revolutionize healthcare, enhance governmental efficiency, accelerate the transition to sustainable energy, and enable personalized education for all.

This transformation is also driven by a renewed German commitment to quality. The focus is no longer just on building the best cars but on finding solutions to society's greatest challenges. At the core of this is a new German culture of innovation, which combines a commitment to excellence with social responsibility. Innovation culture encompasses the values, norms, and behaviors that shape innovation processes in business and society. It also includes a "mindset" that encourages experimentation and risk-taking.

German innovation culture has long been defined by a love for precision and thoroughness, deeply rooted in the national mentality. Richard Wagner once said that it is "German" to pursue a craft for its own sake and the joy it brings. This attitude still echoes in the quality standards of German industry today. This kind of perfectionism has led to a worldwide appreciation of German products for their quality and reliability, and the drive to make the most of technological possibilities remains a hallmark of "Made in Germany."

But the high ambition for quality also has its weaknesses. In times of rapid change, perfectionism and an aversion to risk can slow responses to disruptive innovations – particularly challenging in the fast-paced tech industry. An invention is the development of a new product, technology, or method that did not previously exist, often a result of creative thinking and technical skill. However, an invention becomes an innovation only when it finds practical use and brings real value. Germans have always been remarkable inventors and engineers, perfecting their products with meticulous attention to detail. Yet, disruptive innovations have often come from elsewhere. The automobile, for instance, was invented in Germany, but its breakthrough to the mass market happened in the U.S.

Austrian-born management thinker Peter Drucker described innovation as "the specific tool of entrepreneurs," advising that innovation should be systematic and purpose-driven, focused on solving real-world problems rather than on technical novelty alone. For companies implementing AI, the key question is not "How do we use AI?" but "What problem can we solve with AI?" Drucker included social issues in this perspective, emphasizing that successful innovators view change as an opportunity, while staying grounded in their strengths. For Germany, that means retaining a focus on quality and perfection.

In an era of rapid technological change, we must also value lifelong learning. A new German culture of innovation would combine the drive for quality with a flexible and pragmatic approach to innovation, keeping human benefit at the forefront. A core principle for German innovation culture could be to develop technology in the service of society – with high standards of quality, but focused on problem-solving rather than technical detail. This also requires contextual awareness to identify specific needs and challenges. Germany has shown this capability in the past. The success of the VW Beetle during the economic boom wasn't just a technical feat but a social promise of individual mobility for all.

### A hybrid culture of innovation that brings together the best"

Today, AI in Germany could be understood as a high-quality technology. AI offers the chance to continue on this path – to autonomous vehicles, new mobility concepts, and ultimately a better quality of life for everyone. This new German culture of innovation also requires a continuous commitment to learning, recognizing that experimentation and iterative improvement are just as vital as striving for perfection. Breakthrough innovations often emerge through incomplete prototypes and by embracing failure as part of the process.

Germany has an opportunity to develop a hybrid culture of innovation that combines the best of both worlds: the commitment to quality and perfectionism that supports sustainable and reliable innovation, coupled with a greater willingness to take risks, experiment quickly, and leverage economies of scale more efficiently. Such an approach could form the foundation of a strong German role in global AI development.

Germany's new innovation culture can also draw inspiration from Gutenberg's legacy. The invention of the printing press was not just a technical breakthrough but a creative reimagining of existing technologies for an entirely new purpose. AI could similarly be developed in Germany with this mindset: by combining existing skills and technologies into something new that delivers real value to society. This would represent the cultural shift the country urgently needs. O

The U.S. computer scientist James Landay on his research on "Human- Centered AI" that also takes societal context into account.

Human-Centered AI

"We Need

a Holistic

Approach"

Photo Christine Baker

#### James Landay, how do you define Human-centered AI?

Human-centered AI goes beyond user-centered design by involving the right people to ensure AI systems are truly beneficial. Unlike traditional software, AI affects not just users but also those providing data or impacted by AI-driven decisions, like in healthcare. It must also address broader societal impacts, requiring interdisciplinary teams of technologists, designers, social scientists, and domain experts.

#### Does this mean human-centered AI has to integrate its impact on society from the start of the design process?

Absolutely. You can't tack on ethical or societal considerations after the fact. We've seen with platforms like Twitter and Facebook that when these concerns are addressed too late, business priorities often override them. That's why social scientists, ethicists, and other experts need to be involved from the beginning.

#### You've used the example of autonomous cars to illustrate human-centered AI. Can you explain this further?

Autonomous cars have been studied for decades, but the focus has been on replacing drivers, not the broader societal impacts. The first fatality happened because the system failed to recognize a person pushing a bicycle. Autonomous cars could also worsen traffic by encouraging longer commutes. Early consideration could have led to better public transportation or integration with transit, but without it, corporations may shape these decisions to fit their own interests.

## What are the broader implications of not considering societal factors early in AI development?

Ignoring societal impacts in AI development can lead to solving one problem while creating others. For example, focusing only on replacing drivers with autonomous cars could worsen traffic congestion and divert funds to highway expansion instead of better public transit.The key is to consider societal effects from the start, ensuring technology benefits everyone, not just a select few. We need a holistic approach, similar to urban design, where the larger context matters. We must consider not just users but also communities and societal effects.

### Are there non-AI paradigms that could inform human-centered AI?

While there isn't a perfect analogy, fields like urban design and financial regulation, which consider broader systemic issues, offer insights. My research focuses on creating a design process that incorporates these considerations, working with corporate partners to apply it to real-world projects. The goal is to develop a replicable process for students and professionals.

### Can you share an example of a successful human-centered AI project?

We're designing a smart speaker for older adults to age at home, involving not only the elders but also care workers and the community in workshops. This ensures we consider the whole ecosystem, not just the end user. We are also partnering with labor unions to understand how AI might impact the workers, helping us anticipate societal effects like job displacement or upskilling.

### How open is the corporate world to human-centered AI?

Many companies genuinely want to implement AI responsibly. Initially, I was skeptical, but they're seeking guidance on how to do it right. There's a strong desire in the corporate world to figure out the best approach for responsible AI. **How is "trustworthy AI" different from human-centered AI?** 

Trustworthy AI is a feature of a system, while human-centered AI is about the

process of designing it. Trustworthiness can be a goal of human-centered design, where we ensure the system is reliable through design steps. For example, a chatbot might lack trustworthiness if it doesn't allow users to correct mistakes or provide feedback. Human-centered AI focuses on creating systems with positive human impact, and trustworthiness is one value that can emerge.

### Do you see human-centered AI as a democratic project?

I'm cautious with terms like "democratizing AI" because new technologies often benefit the wealthy and educated. Human-centered AI involves more people in decision-making and shares power more broadly. It's a step in the right direction, but whether it's enough remains to be seen.

### What are the main challenges to achieving human-centered AI?

A key challenge is proving the value of this approach. Companies may see it as costly and time-consuming. We need case studies showing both the risks of not using human-centered AI and the benefits, much like we did with user-centered design years ago, to demonstrate that it ultimately saves time and resources.

### What's the difference between humans and machines?

Humans are social beings, forming relationships and sharing meaningful connections. Machines, while able to simulate behavior, lack the emotional depth and relational understanding that define human life. C

James Landay is a Professor of Computer Science at Stanford University's School of Engineering. He is also the co-founder and codirector of the Stanford Institute for Human-Centered Artificial Intelligence (HAI).

## Stories that

The Munich-based video, installation, and projection artist Betty Mü discusses her installation in the IPAI Living Room.



In addition to video mappings, Betty Mü specializes in immersive and interactive projects, as well as AR.



#### What makes an artist an artist? This question is particularly relevant in the age of artificial intelligence.

For me, AI is a tool - nothing more, nothing less. My creative process has definitely become much faster and more versatile since I started working with AI. How one uses AI and what emerges from it is what makes the difference. It's important that originality, creativity, and that artistic spark remain at the forefront. I use many tools simultaneously - editing programs, After Effects, 3D programs, Photoshop, and of course, Al. Al often comes into play when I replace one of my steps with an AI tool. What's interesting is that you can input the same prompt into multiple AI tools and receive entirely different results from each. Finding the tool that best aligns with one's vision is a personal journey.

### If you want creative people, give them enough time to play." John Cleese

#### My installation in the IPAI Living Room is called "Metamorphosis," symbolizing transformation, development, and

**change.** The idea is to showcase a universe of artificial intelligence in a state of continuous evolution - similar to nature, which is also always changing. New AI tools emerge every day, technological advances happen incredibly fast, and in the same way, the campus where the visitor center is located is also evolving. My work brings this place to life with fantastic flowers and creatures. The concept of a "Global Home" deeply inspired me. What I love is that the campus becomes its own world, constantly growing. This is reflected in my installation "Metamorphosis" - a small vision of the future that captures the "Global Home" idea. The round shape of my installation fits perfectly, as the campus is also designed to be circular, like a pulsing anthill. For me, the ants, metaphorically speaking, run through the images.

Photos Miki Kuschel Sebastian Donath

In art, I have the freedom to experiment with AI, which sometimes feels like a fizzing candy explosion. But it's also important to use AI carefully – just as we should treat the environment responsibly. My works often have a meditative quality. They invite people to leave behind the everyday world and immerse themselves in new, immersive realms. Coming from the club scene, where I created live visuals, this background influences my work. With immersive spatial compositions and video mappings, I can now even tell stories - stories that go deep and resonate emotionally. I'm pleased that there are now exhibitions where the audience becomes part of the artwork. AI can play a decisive role here, opening up new, previously unimaginable possibilities.

I want visitors to my installations to have interactive experiences. I hope they don't just look at the art – I want them to talk about it, discover it together, maybe even with their phones: "Look at what's happening there!" Augmented Reality offers wonderful possibilities here, as you can use a smartphone to experience the art together. This differs from Virtual Reality, where you're often isolated in a headset. AR enables a shared experience, and that's especially important to me.

There's a quote by John Cleese: "If you want creative people, give them enough time to play." That perfectly describes me. One must be allowed to play and experiment. At IPAI, I had this freedom - playful, creative, and full of possibilities. That's something I truly value. O TEXT Betty Mü





Visitors to the IPAI Living Room discover and experience the installation together.

## A Space

How can we design spaces that make technology tangible? Art expert and curator Constanze Zawadzky discusses art, AI, and her vision for the IPAI Living Room, the public visitor center of IPAI.

## Constanze Zawadzky, what role does art play in the AI transformation?

The role of art is always to raise questions and offer alternative perspectives on the world. It can stimulate public discourse, including about new technologies like AI. Art can inspire people to think about responsible AI and simultaneously fuel innovation. It encourages engagement by appealing to all senses and invites a creative approach to AI. What idea is behind the concept and design of the IPAI Living Room?

The goal is to make the core concepts of Al tangible and to foster interaction between the Al community and the public. Our three guiding principles are encounter, understand, and inspire. These principles are reflected in various areas of the IPAI Living Room.

## What role does interactivity play in the IPAI Living Room?

It's a central principle. We want visitors to experience technology through interaction. Everything is designed to allow hands-on exploration. Our aim is not just to explain AI theoretically but to make it tangible. This hands-on approach helps convey complex topics in a more accessible way.

## How does the spatial design support the culture of innovation within the IPAI community?

We deliberately chose warm materials and colors to create an inviting, sensory atmosphere. We didn't want the IPAI Living Room to feel too cool or sterile. It was essential for us that technology doesn't dominate everything but that a sense of comfort is also established. The spaces encourage spontaneous encounters. There are no barriers—anyone can approach anyone. At the same time, quieter areas provide space for focused work.

## This sounds like an open and flexible concept...

Our focus is on enabling the community to grow and evolve by being actively engaged. We aim to create a framework that allows creativity to flourish. How does the IPAI Living Room foster dialogue with the wider public?

Openness and transparency are central to us. We want to communicate outwardly about what's happening at IPAI.





The central principle of the IPAI Living Room: Experiencing technology through interaction.


Citizens should have the chance to participate and ask critical questions. For example, our "Living Room Sessions" are events featuring tours, talks, and music.

## What role does art play in the IPAI Living Room?

With the interactive installation by artist Betty Mü, we want to showcase how AI is used in art. An art installation can interrogate AI in a different way, as artists often critically engage with new technologies. Our vision is to encourage dialogue and discussions among visitors. Ideally, people would talk about the installation, about AI, and its value to society.

## How do you envision the future of the IPAI Living Room?

We plan to continuously evolve the IPAI Living Room, introducing new formats and artistic installations to keep it a lively space for dialogue and innovation. The IPAI Living Room should always remain dynamic and provide fresh inspiration – to the community as well as to the public. O

## The IPAI Living Room should always remain dynamic and provide fresh inspration."

Constanze Zawadzky is responsible for the Art & Culture sector at IPAI.



# The Miracle of Heilbronn



Heilbronn's "experimenta" is Germany's largest science center. Mayor Harry Mergel on Heilbronn's transformation from a wine and trade city to a hub of education and innovation.

## Mr. Mayor, how would you characterize Heilbronn today?

Heilbronn is an extraordinarily privileged city today. No other city of this size in Germany is developing as dynamically. Notably, it has transformed from an industrial city into a center for education and applied artificial intelligence. Dieter Schwarz and his foundation have played a crucial role in this development. Additionally, the beautiful location surrounded by vineyards and shaped by the Neckar River adds to its charm. Heilbronn has a rich history. How has this history shaped the city to this day? There isn't a direct line from the March Revolution of 1848 to today, but the strong civic and entrepreneurial spirit that developed in the 19th century is still tangible. Many companies founded back then, such as Baier & Schneider, Brüg-

gemann, or Knorr, have endured and continue to shape Heilbronn. This tradition forms the foundation of the city's current innovative strength. How is this past reflected in the city's current innovation projects?

Economic innovation requires openness

and a willingness to adapt. This evolution began in the 19th century and continues with extensive transformations impacting nearly every sector of the economy.

# How did the city evolve from the devastation of World War II to the innovation hub it is today?

Heilbronn was severely affected by air raids in WWII, particularly on December 4, 1944, when over 60% of buildings were destroyed or heavily damaged. After the war, the city faced the challenge of rebuilding, with the initial phase largely completed by 1953. This "miracle of Heilbronn" laid the foundation for today's rise as a major innovation center, supported by education, research, and the Dieter Schwarz Foundation.

## What is the city doing today to strengthen Heilbronn as an innovation hub?

Our support starts with early childhood education since a well-educated workforce is key to fostering innovation. In Heilbronn, there are no kindergarten fees from the age of three, making it attractive for young families. We also invest in our schools and support



Harry Mergel has served as Mayor of Heilbronn, a city of 132,000 residents, for ten years.

# **C** Tradition and innovation are not opposites."

Heilbronn's development as a center for higher education and research. Economic development initiatives help businesses settle and expand here. Soft location factors such as shopping options, recreational activities, and a vibrant cultural scene boost the quality of life. Our startup competition encourages innovative ideas in retail and gastronomy to keep the city center lively. **You mentioned the importance of** 

## education for Heilbronn. What specific role do the Heilbronn Education Campus and other institutions play in this regard?

The development of the Education Campus and the establishment of universities like the Technical University of Munich and ETH Zurich have fundamentally transformed Heilbronn's national and international perception. These institutions open new cooperation opportunities between regional businesses and research. The city supports this growth by addressing zoning, infrastructure, housing, and childcare to accommodate the rising population. **How does Heilbronn balance tradition with innovation?** 

Tradition and innovation are not opposites. While viticulture and the Neckar River are no longer as economically central as they once were, they remain important cultural and identity-shaping elements. They reflect our ability to preserve traditions while embracing innovation.

## What is your vision for the future of Heilbronn?

With our strong landscape of higher education and research, alongside favorable conditions for startups, we have created fertile ground for businesses and talent. Our strategy is to continue cultivating and enriching this foundation. We're committed to a range of initiatives to enhance the quality of life in Heilbronn. Our goal is not only to continue the city's economic growth but to make it an even more appealing place to live and love.

## Is there a connection between Heinrich von Kleist's character Käthchen of Heilbronn and the values that define Heilbronn today?

In a modern interpretation, Käthchen embodies not only loyalty and steadfastness but also represents a strong young woman who, despite societal obstacles, pursues her path and goals unwaveringly. It is precisely this persistence and individuality that remain important values for us today to achieve success along with loyalty and reliability. O

# Statements\_ Future

What Mindset Do We Need in Germany and Europe to Drive AI Transformation – And What Must Be Addressed Now?

## **Openness** to Innovation and Social Orientation

#### Harry Mergel

Mayor of the City of Heilbronn

"In Germany and Europe, we are at a critical juncture to actively shape the AI transformation. It's essential to approach the opportunities and challenges of artificial intelligence proactively. This can only be achieved with a mindset that combines openness to innovation with a strong social compass. We must focus on ethically grounded, human-centered development that builds trust and maximizes both economic and social benefits. Only in this way can we ensure that AI solutions serve the common good and leave no one behind. It's crucial to train skilled professionals and equip the general population to engage with new technologies. At the same time, we must ensure equitable access to these technologies. Europe and Germany can and should take a leading role by fostering international cooperation and cross-disciplinary exchange."

# Active Participation

## Andreas Liebl CEO appliedAl Initiative GmbH

"AI represents the most significant shift of our time. It will open up entirely new possibilities for us - personally, professionally, and socially- much like electricity once did. We have the choice to remain on the sidelines with this technology or to actively participate in shaping it. In the land of inventors, family businesses, and hidden champions, we should see AI as a new tool that helps us remain competitive and create value. We shape the world with AI; AI does not shape us or our economy. As appliedAI, we support entrepreneurs and their companies in applying in adopting AI solutions, together with IPAI. Just like with personal fitness goals, a business can be trained step-by-step to become proficient in AI. Waiting and hoping it will somehow be easy to adopt later is not an option."

# Courage and Perseverance

Moritz Gräter CEO IPAI "Bringing AI into real-world application is not some distant vision—it's a task for the here and now. The technologies and solutions are ready to be integrated into value chains to boost efficiency, productivity, and competitive advantage. For this to succeed, we need entrepreneurial courage, a desire to learn and create, and above all, perseverance. The starting point is indeed challenging: many companies lack data strategies, IT budgets are limited, skilled professionals are scarce, and regulations remain unclear in places. To ensure that this complexity sparks ambition rather than paralysis, IPAI focuses on a cooperative ecosystem, open innovation, and collaboration across all players—politics, research, academia, startups, and established companies. One thing is clear: in Germany, we have all the ingredients we need. Our companies know their industries inside out and have developed incredible excellence over decades. If we're bold and persistent, we'll succeed in this race to catch up."

# Free Experimentation

#### Betty Mü, Artist

"Fear of the unknown is an all-too-human instinct. I can certainly understand the concerns many of my colleagues have regarding AI, as it suddenly questions the work methods and perspectives we've maintained over time. But aren't we, as artists, pioneers in the unknown? Isn't the search for new paths and forms of expression a fundamental part of our artistic process? I believe we're just at the beginning of this unique AI journey of discovery. I've long been bitten by the travel bug—I try and experiment, discovering new tools and fantastic freedoms. I'm curious about what tomorrow will bring, what new things await to be explored and created. AI won't replace us. As artists, we'll continue to bring our originality, emotional depth, and authenticity to our work. But AI can help us experience and express ourselves as humans in ways that were hardly possible before. What a wonderful opportunity!"

# Flexibility and Spirit of Collaboration

Marc Henninger und Jessica Herrmann Police Director and Chief Detective Inspector, Baden-Württemberg Police

"To drive the AI transformation within the police force, we need an innovative mindset and the courage to integrate new technologies and approaches. We must be open and flexible toward new technologies and ready to use digital tools purposefully to ensure the best possible safety for citizens. At the same time, it's essential to develop clear ethical guidelines for AI usage. The police should collaborate closely with research institutions and technology firms to integrate and advance modern solutions effectively. Beyond implementing AI, we must adjust organizational structures since digital transformation affects us both technologically and humanly: our staff must be empowered to use AI responsibly and effectively. Leadership is crucial in cultivating the right skills and prioritizing ongoing education to be prepared for the challenges of the future."

# **Openness** and Self-Reliance

#### Vasilij Baumann

Co-Founder & Co-CEO InstruNEXT

"Artificial intelligence is an advancing technology of immense importance for humanity-comparable, perhaps, to electrification. We cannot afford to miss out on the opportunities this brings. The recent AI boom has inspired researchers and entrepreneurs worldwide. Every day, new ideas are created, eagerly discussed in the community, further developed, and transformed into new products and business models. To keep up, society, politics, and the economy need to adopt an ,early adopter' mentality. This includes openness to implementing new concepts and products early on to quickly gain practical experience with the technology, as well as the commitment to building genuine, self-sufficient AI expertise. Ultimately, the most important factor is having the courage to make the necessary investments to accelerate AI adoption, rather than waiting to see how others take the lead. Only by doing so can we actively shape this technology ourselves." O

Human AI\_

# The Power of Values

Developing human-centered AI is not only a technical challenge but also a philosophical endeavor.

Values are what guide us, providing stability in a world full of possibilities. But what exactly are values? What defines them? This question is far more complex than it might first appear – especially in the context of human-centered AI, an AI designed to serve humanity and work for human interests. How do we assess the value of a decision made by AI? By its utility, efficiency, market value, or ethical integrity?

The debate around values has a long European tradition. Since the Enlightenment, values such as freedom, justice, and solidarity have formed the moral foundation of European societies. The digital age, particularly the rise of AI, puts these values to the test. The question of accountability for algorithmic decisions is an ethical issue that needs ongoing negotiation.

American philosopher Michael Sandel warns of the encroachment of market values into areas of life where they do not belong. This risk exists in the technological realm as well: if AI is primarily driven by economic interests, we lose sight of values that extend beyond pure efficiency. Here, Europe has a unique opportunity to create a counterbalance. AI that serves not only economic ends but prioritizes the well-being of all people would be a genuinely European contribution to global innovation culture.

Max Weber once advocated for a "value-free" science to preserve objectivity. However, in the realm of AI development, the question arises of whether such a renunciation of values is even possible or desirable. Values are not just an intellectual concept; they serve as a compass that helps us navigate the dense forest of technological possibilities. On the other hand, adhering to values should not lead to rigid ideology or indoctrination. People need AI that reflects values rather than dictating them in absolute terms. Such AI can be more than a tool: it can become a partner that supports people in their strengths and weaknesses – without undermining individual judgment or personal freedom.

A European innovation culture based on dialogue, cooperation, and constructive debate provides a foundation for developing human-centered AI. Germans and Europeans should not be focused solely on optimizing efficiency. Together, we can create technological solutions that uphold human dignity and promote a good life for everyone. This also means allowing for mistakes and acknowledging uncertainties – something that is difficult to embed within machine logic but is essential for humanity.

Developing human-centered AI is not only a technical challenge but also a philosophical one. It's about distinguishing the valuable from the worthless and embedding ethical practices in society, its organizations, and institutions, which consider both human needs and technical realities. Europe has the potential to lead – not through the fastest development, but through deep reflection on what we consider valuable and how we can keep these values alive in an AI-driven world. O TEXT *Rebekka Reinhard* 

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# Glossary

*Autonomy*\_ The ability to make individual or collective decisions independently and to act without external compulsion. In the context of AI, it is ethically crucial to develop systems that promote users' autonomy.

*Human AI\_* A human-centered Artificial Intelligence that places ethical values and human needs at the forefront. Its aim is to develop technologies that support people without compromising their autonomy. Human AI builds trust, facilitates market access, and promotes sustainable use.

*Intelligence\_* The ability to solve complex problems and apply knowledge effectively. Philosophically, the truthfulness and quality of both human and artificial "intelligence" are critical; economically, intelligence contributes to better decision-making as well as increased efficiency and productivity.

*Sustainability* The responsible use of resources to ensure long-term ecological, social, and economic stability. In the context of AI, this means developing energy-efficient systems while considering their impact on social factors. From an economic perspective, sustainability offers competitive advantages.

**Responsibility\_** The ethical obligation or stance to reflect on one's actions and be accountable for their consequences. In AI, this involves the responsibility of developers and users to minimize potential risks. Responsibility also entails adhering to regulatory requirements and building trust.

*Trust* The foundation of all social and economic relationships, which relies on the security and confidence in the reliability of the other party. In the context of AI, trust means that users perceive the technology as safe, transparent, and fair. Trust is also essential for the acceptance of products and their successful market introduction.



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