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AI Trends Report 2025

HELLO WORLD

Foreword

AI Trends 2025: Between Global Race and European Balancing Act

Foreword by Sebastian Heinz, Founder and CEO of statworx

AI is here. What began as a one-line social media post by Sam Altman in November 2022 spread like wildfire across the world within a few months.

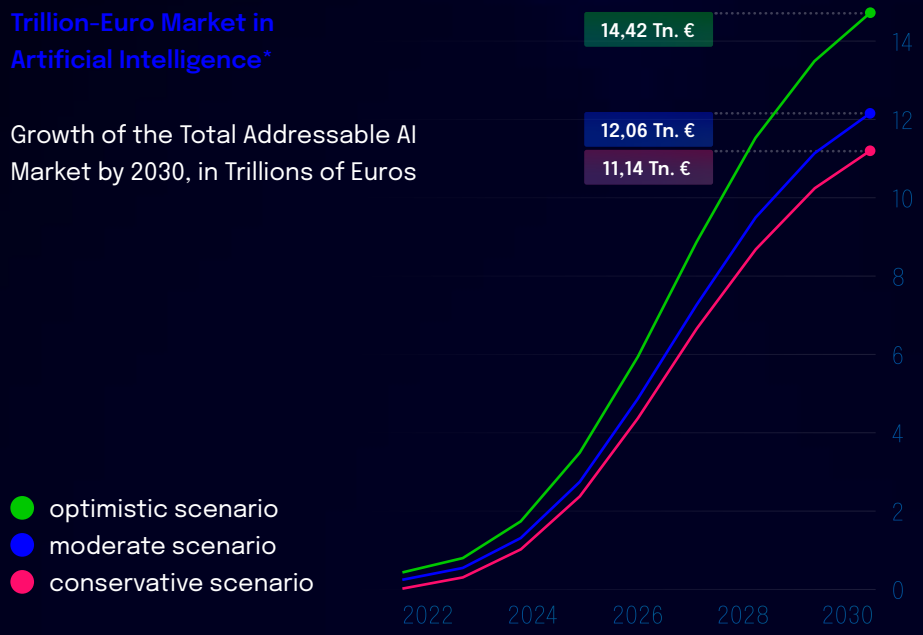
Fast forward to January 2025: AI is already an integral part of everyday life for millions of people. Users can add the American number +1 800 242-8478 to their smartphones via WhatsApp to chat with OpenAI's AI. Through an early investment by Microsoft in OpenAI, ChatGPT has reached the workplace of millions of people in the form of the Microsoft Copilot. Last year, Apple integrated ChatGPT directly into the new operating system of its Macs. The prevailing market rules for growth speed seem to have been completely overridden for AI. No other technology in the history of mankind has spread across the globe with this force and speed.

Artificial intelligence is undergoing an unprecedented development that is already triggering fundamental changes in business, society, and science. Experts estimate that AI will generate around 13 trillion (according to McKinsey even between 18 and 26 trillion) US dollars in new global added value by 2030. This corresponds to three to six times the German gross domestic product. The same is expected to increase in the same period. On the stock markets, AI and tech companies are experiencing a spectacular rally, led by US chipmaker NVIDIA, which symbolizes the AI boom on the stock markets like no other company. Just in January of this year, NVIDIA CEO Jensen Huang presented an "AI PC" for the desk at CES in Las Vegas, which is intended to further democratize and advance the development of AI models.

Even the historic crash on the US stock exchanges on January 27, 2025, triggered by the release of the AI model "DeepSeek R1" from China, which cost the US tech industry more than $1 trillion in market capitalization, was largely forgotten shortly afterward. But scars remain. The previously seemingly untouchable AI dominance of the USA was severely hit and shaken by DeepSeek. The reason for this was rumors that the DeepSeek team was able to train their new model with „only" a 6 million dollar budget, thus making the US narratives of "Billion Dollar AI" absurd. It is now known that DeepSeek, as part of the Chinese hedge fund "High Flyer," probably had access to over 50,000 NVIDIA GPUs and that the estimated development costs were more in excess of the 1 billion dollar mark.

Trillion-Euro Market in Artificial Intelligence*

Growth of the Total Addressable AI Market by 2030, in Trillions of Euros



A global race, or rather an arms race, for AI supremacy has begun. Led by the USA, which, based on its strong venture capital infrastructure, is investing insane sums in the development of AI products, services, and business models, more and more countries around the world are preparing their economies, sometimes at high financial costs, for the upcoming AI transformation. AI is becoming a „big numbers game." Even in the USA, the land of (financially) unlimited possibilities, AI is leading the established venture capital industry to its financial pain threshold. The sums required by the so-called Frontier Labs, the pioneers of the AI revolution, to develop new models are so astronomically high that only select groups of financially potent investors can even invest. In doing so, they are throwing decades of established principles of risk and portfolio diversification overboard. The best example of this is Project „Stargate," a 500 billion dollar investment package in AI infrastructure, which was announced at the beginning of the year by Donald Trump, OpenAI, Softbank, and Oracle. Shortly afterward, it was leaked that „Stargate" was made exclusively available to OpenAI and that OpenAI was involved in a series of important AI government projects.

„All in on AI" is the motto. New AI models with ever-improving capabilities are appearing almost daily. Just recently, OpenAI's new model „O3" (O2 was unfortunately already occupied for trademark reasons) largely solved the so-called ARC-AGI test – previously an almost insurmountable problem for AI models. Meanwhile, the company is already training o4. It is hardly possible to keep track of global developments in the field of AI. The Cambrian explosion of artificial intelligence is in full swing. An important driver of this development are open source AI projects that build on the models and findings of other „contributors." Proponents of this movement argue that AI as a technology should be free, transparent, and available to everyone. This global development strand, running parallel to the closed developed AI models of OpenAI and Anthropic, is led by Meta, which has been fully committed to the idea of freely accessible AI development for years and is also making massive investments in AI research and infrastructure.

But something is brewing. The high investments in AI are currently facing only manageable, concrete financial added values. The anticipated economic added value of AI has, as of 2025, not yet materialized in many areas. The gap between AI investments and revenues is widening. Both on the user and developer side. For example, OpenAI CEO Sam Altmann casually announced last year that „he doesn't care whether it takes 5, 50 or 500 billion dollars per year to develop an AGI." On the other hand, his company OpenAI is notoriously unprofitable and, at least as of today, shows no clear path to profitability. Companies that consume Altmann's AI products are also largely still strug-

*Source: Statista

gling to use AI profitably across the board to save costs or increase sales. The reasons for this are manifold: chronically neglected data management, lack of skills, underinvested initiatives, no strategy, little willingness to change. The list could go on endlessly. The fact is that investments in research & development and the application of AI are increasingly decoupling. The discrepancy between expectations in AI and reality is beginning to widen significantly. The AI bubble is threatening to burst.

The increasing discrepancy is also no longer solely characterized by economic challenges. While the financial and strategic hurdles for companies are already considerable, another dimension is being added in Europe: regulation. Through the European AI Act, which is gradually coming into force since 2024, Europe has defined legal frameworks for the application of the technology at an early stage – also for international companies that offer their AI products in Europe. A difficult balancing act between urgently needed AI innovation and the preservation of European fundamental values. So far, the AI Act has, among other things, meant that important AI products from Frontier Labs, such as the OpenAI video generator SORA or Meta AI, are either not available in Europe at all or only with considerable delay. Sizes of the US tech industry such as Mark Zuckerberg and Spotify founder Daniel Ek recently complained about the „increasingly unpredictable" European regulations.

However, individual European companies are also succeeding in playing a role in the global AI competition. In addition to the German AI translator DeepL, which announced a 300 million dollar financing round at a valuation of 2 billion dollars in May 2024, Mistral AI, a French AI lab (6 billion dollar valuation) and Huggingface, a French AI platform company for open source AI (4.5 billion dollar valuation) are currently particularly relevant globally.

→ *Of course, well-known US VC and tech investors are invested in these companies and thus benefit from their innovation and value development. „Homegrown AI, made in Europe, backed in Europe" that goes beyond European borders does not factually exist. A dangerous gap is emerging – also taking into account current geopolitical developments.*

Many voices, now also at the international level, criticize Europe's slowness and lack of willingness to take risks and invest in the AI race. Germany is no exception. Although the Federal Republic has had a national AI strategy for five years, it is at best to be used as a paper airplane. The ongoing, unclear political situation in the Federal Republic is also costing valuable time to invest decisively and purposefully in AI and to catch up. Of course, the German AI market is not standing still, but is growing according to forecasts at an annual rate of approx. 15 %; the market volume is expected to grow to 27 billion euros by 2030. A study by Prognos and Handelsblatt also shows that the German AI ecosystem is comparatively well positioned in certain areas in a global comparison, e.g. in the concrete application of AI technology in companies.

HELLO WORLD

Secure, regulated application instead of AI innovation on the edge of what is feasible? Is this the European, the German AI path? So much should be said: If the forecasts of the AI optimists (to whom I would also count myself) are even remotely correct, we as a united Europe cannot under any circumstances allow the value creation newly created by AI to depend on individual, external actors – be they individual companies or individual nations. In 2025 and the coming decade, it must be our task to master the balancing act between AI innovation and the preservation of fundamental European principles. Otherwise, Europe will remain a mere consumer of global AI innovations and fall into an unacceptable dependence on the actual drivers of the AI transformation. We are already heading towards this scenario. Time to act.

I hope that in this introduction I have been able to show how complex and highly exciting the developments in the field of artificial intelligence are progressing. In the AI Trends Report 2025, we therefore not only want to touch on short-term trend topics, but also present the most comprehensive, sometimes macroscopic picture possible for the year 2025. Of course, this status quo is only a snapshot. And like every snapshot, it can only capture a limited section of the big picture. Depending on the perspective and zoom level, some details become sharp, while others blur in the out-of-focus range. But this limitation is precisely its strength: it focuses our attention on what is important at this moment: **the most important AI trends for the year 2025.**

I wish you a lot of fun and interesting thoughts while reading!

Sebastian Heinz
Founder & CEO statworx | AI Hub Frankfurt

Content

2024

REVIEW

Last year, we ventured into predicting the AI Trends for 2024 and came up with 12 bold theses. Last fall, statworx COO Fabian Müller provided an interim review in a video. You can read a detailed assessment of the trends in the accompanying blog post. Since then, the AI world has continued to evolve. Here's an updated overview of our review:

TREND REVIEW | CULTURE & DEVELOPMENT

1 Data Culture becomes a competitive advantage

Our prediction about the importance of data culture in companies was a no-brainer and remains so. Companies with strong data culture have made significant progress in AI utilization.

Score 

2 The four-day workweek: AI's unfulfilled promise

While artificial intelligence has fueled discussions of a four-day workweek, it hasn't yet delivered the productivity gains needed to make it a reality. The shift remains more a socio-political aspiration than a technological inevitability.

Score 

3 Omnimodal AI brings AGI closer

Advances in omnimodal AI models and their reasoning capabilities are accelerating progress toward artificial general intelligence (AGI). Our annual report revisits the question: How close are we, really?

Score 

4 AI-generated movies revolutionize media production

Generative video AI like Sora is transforming media production. But despite the hype, 2024 has yet to see the release of a fully AI-generated blockbuster.

Score 

TREND REVIEW | DATA & TECHNOLOGY

5 Nvidia loses dominance in the GPU market

Nvidia defied predictions and solidified its dominance in the GPU market in 2024. Despite intensifying competition, its superior hardware and software proved decisive. Our report explores how competitors are strategizing to challenge this reign.

Score 

6 Better AI models require innovation, not more data

While large language models still dominate, smaller, more focused models are gaining traction (especially DeepSeek). The key to future AI advancement lies in a strategic blend of data quality and quantity, not just sheer volume.

Score 

7 2024 will be the year of AI integrators

While companies like Microsoft, Apple, and Meta, which interface directly with AI users, have reaped rewards, 2024 belonged to chip manufacturers like Nvidia. They provided the essential hardware underpinning the AI revolution.

Score 

8 An open-source Model surpasses the latest GPT version

Proprietary models like ChatGPT and Gemini lead in general language processing, context understanding, and creative tasks. However, open-source models (most recently, DeepSeek) are rapidly catching up, offering competitive–and sometimes superior–solutions in specialized areas like code generation.

Score 

TREND REVIEW | TRANSPARENCY & CONTROL

9 AI Transparency becomes a competitive advantage for EU startups

The EU's AI Act has heightened the demand for explainable AI, particularly in regulated sectors. While many legal experts tout it as the key to legal compliance, European AI startups have yet to capitalize on transparency as a significant competitive advantage.

Score 

10 The AI Act becomes a seal of quality for AI "made in Europe"

The EU's AI Act presents more challenges than opportunities for AI companies, especially startups. Uncertainty around implementation and regulatory requirements continues to plague the industry. The Act remains a central focus of our annual report.

Score 

11 AI Agents transform the economy

AI agents are gaining momentum, but they haven't yet permeated everyday work life. While OpenAI's Operator offers a glimpse of the potential, further technological development and broader societal acceptance are necessary. We dedicate a chapter to this evolving field.

Score 

12 Foundation models increasingly focus on alignment

Aligning AI models with human values and intentions is a top priority across the industry. Human-inspired thinking is seen as crucial for unlocking AI's full potential. Crucially, alignment is also essential to preventing AI models from generating falsehoods and engaging in deception.

Score 

WHAT'S IT ABOUT?

Intro

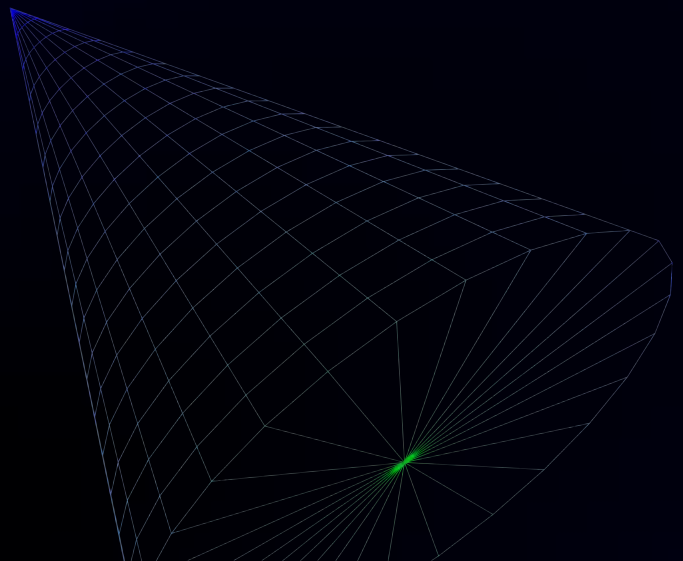
The AI Trends Report 2025 presents 16 dynamic trends unfolding across 5 key areas:

Innovation & Transformation
Regulation & Investment
Education & Development
Technology & Progress
Corporates & Startups

This report provides critical insights for businesses and decision-makers to understand, prepare for, and capitalize on the upcoming changes. In this regard, the AI Trends Report 2025 is ideal for navigating the ever-changing AI landscape.

01

INNOVATION & TRANSFORMATION



TREND 1

AI Agents revolutionize the job market

TREND 2

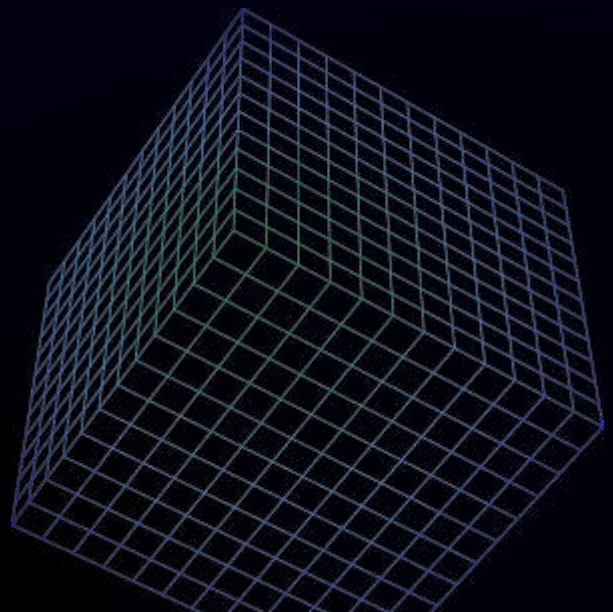
Low-code and no-code demo-cratize software development

TREND 3

AI achieves its first big scientific breakthrough

02

REGULATION & INVESTMENT



TREND 4

Tech giants release “AI light versions” for the EU market

TREND 5

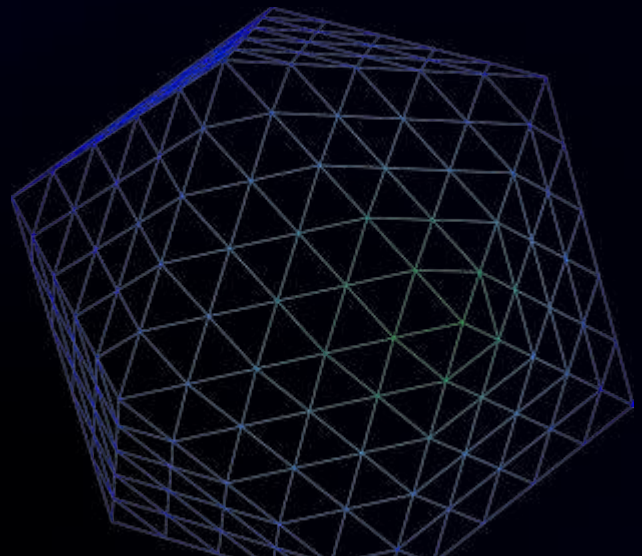
The AI investment bubble bursts

TREND 6

AI Avatars shape new creative and ethical standards

03

EDUCATION & DEVELOPMENT



TREND 7

Article 4 of the AI Act promotes AI education in companies

TREND 8

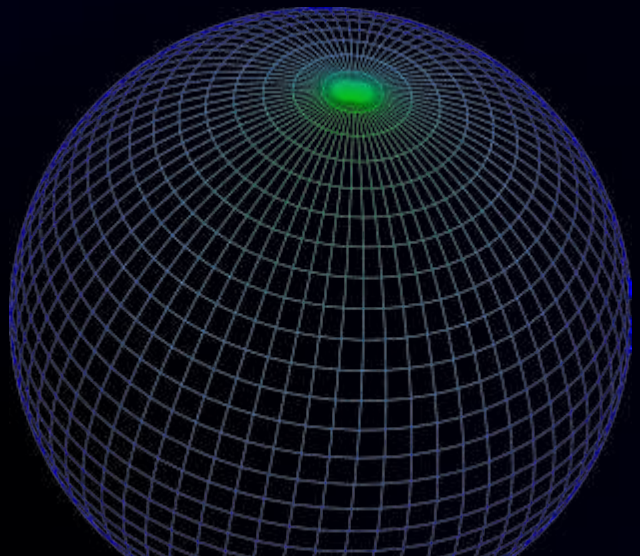
Automated AI learning platforms democratize education

TREND 9

Conversational AI replaces prompting

04

TECHNOLOGY & PROGRESS



TREND 10

AI integration transforms user experiences

TREND 11

Instead of a plateau, we see further progress in LLM performance

TREND 12

LAMs & CUAs take control of your desktop

05

CORPORATES & STARTUPS

TREND 13

Germany plans an AI data center

TREND 14

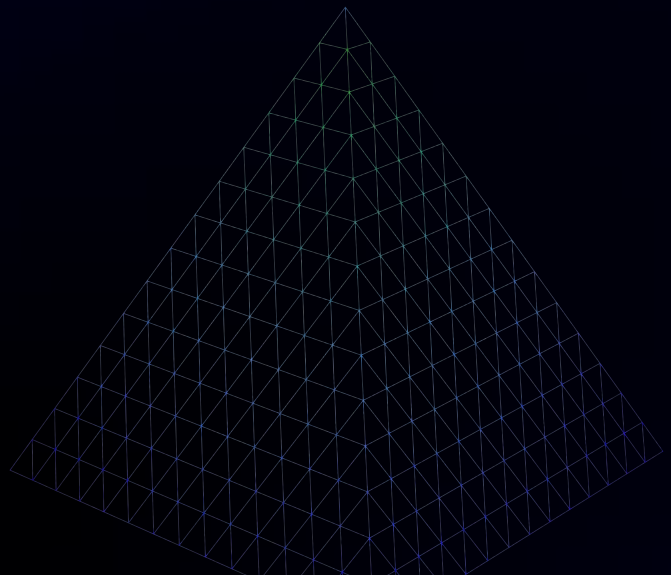
AI Governance becomes a competitive advantage

TREND 15

A German AI startup achieves a global breakthrough

TREND 16

The era of cheap AI is over



01

TRENDS – PART 1:

INNOVATION & TRANSFORMATION

TRENDS – PART 1

TREND 1

AI Agents revolutionize the job market

While digital assistants such as Alexa or Siri have long been part of everyday life for many, we are now at the beginning of a new era of virtual assistants: AI agents. These programs can do more than just perform simple tasks on command. They are able to make decisions autonomously and interact with their environment - without human intervention

AI companies are working intensively on AI agents to deliver on a promise that previous assistance systems have not kept: significant productivity gains. AI agents are intended to make generative AI capabilities easily accessible and automate routine work by closely linking them to business processes and systems. This means that companies should gradually automate their processes by first introducing partial automation through agents and then expanding them to full automation in order to remain competitive. User expectations of interacting with chatbots will change: chatbots should relieve them of work, such as changing addresses in customer service or applying for a new debit card. Such processes are made easier and less bureaucratic as a result.

Google compares AI agents to a chef in a busy kitchen who wants to prepare delicious dishes for his guests.

The chef follows a recurring cycle of information gathering, planning, execution, and adaptation: he collects orders and checks the available ingredients, considers which dishes he can create based on this information, and puts his plan into action by chopping vegetables, mixing spices, or searing meat. He flexibly adapts his plan if ingredients are missing or feedback is received.

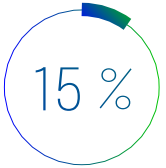
AI agents work in a similar way: they process information iteratively, make informed decisions, and adapt their next steps based on previous results. At the heart of this cognitive architecture is an orchestration layer that coordinates memory, state, reasoning, and planning. It uses methods such as prompt engineering to optimize interaction with the environment and perform tasks efficiently.

Opportunities and expectations

For Europe, AI agents offer the opportunity to increase stagnant productivity and cushion demographic change. For their manufacturers, they finally offer the opportunity to monetize their powerful but expensive language models. The prerequisite for this is that companies quickly see massive productivity gains through the use of agents. There is no lack of enthusiasm among investors: AI agent startups such as wie beam.ai, Make, RagaAI, Twelve Labs, Autodesk and Klaviyo have already been able to raise considerable investment.

Not surprisingly, the market researchers at Gartner also describe AI agents as the most important technology trend of 2025.

They expect that by 2028, around 15 % of daily work decisions will be made autonomously by AI agents.



But other weighty voices are putting the brakes on the hype: Google product manager Logan Kilpatrick predicts that while visual AI (AI vision) capabilities will become mainstream by 2025, real AI agents won't be realistic until 2026. AI vision, the technology for image and video analysis, text recognition, and object identification, is integrated into more and more everyday applications (e.g. Google Lens). Especially in medicine, AI vision offers great opportunities, for example to detect abnormalities in X-ray images. However, for users to fully trust full-fledged AI agents, a higher accuracy of 99 % (versus currently 80 %) is necessary, argues Microsoft's AI chief Mustafa Suleyman. And this level will probably only be reached with GPT-6.

TRENDS – PART 1

The rise of Agentic AI

Nevertheless, the big players such as Microsoft, Amazon, Salesforce, and Google are investing massively in the development of AI agents or Agentic AI (the terms are used synonymously). Microsoft has developed “Copilots” to automate administrative tasks and customer service. Salesforce has already introduced agent features that allow users to create their own chatbots through natural language. The now second version of the AI agent platform Agentforce can proactively take over routine tasks, act outside the CRM system, interact directly with teams, and take over tasks such as scheduling appointments. OpenAI’s ChatGPT Operator, like Claude Computer User, can control the PC and solve many tasks – from restaurant bookings to online orders to filling out forms. And Nvidia has introduced Blueprints, prefabricated blueprints for AI agents that can independently plan and execute complex tasks. These support applications such as automatic code documentation and virtual assistants.

Google has also followed suit and introduced its new language model Gemini 2.0. Gemini 2.0 is “built for AI agents”, can independently access Google applications, masters multiple languages, and has native multimodal capabilities. The highlight: Project Astra with multimodal understanding, multilingualism, tool use, native audio functions, and a memory, which allows users to interact live with their environment.

One thing is clear: AI agents that control our computers will fundamentally change the way we use the Internet. The development will lead to a new way of interacting with the web, where AI agents act as intermediaries between users and the Internet, ending the dominance of today‘s apps.

The example of Nvidia‘s AI Blueprints illustrates how agentic AI transforms businesses by leveraging advanced thinking and iterative planning to solve complex, multi-step problems.

TRENDS – PART 1

The first known example of the large-scale use of AI agents in companies was provided by the Swedish payment service provider Klarna. Klarna's AI assistant has taken over two-thirds of customer service chats in an impressive 2.3 million conversations. It does the work of 700 full-time employees and achieves the same level of customer satisfaction as its human colleagues. This has not only led to a significant increase in efficiency, but has also meant that Klarna, according to its own statement, has not hired any more people for a year. Convinced by the new AI colleagues, the workforce was convinced by promising all employees a share of the possible gains as part of their salary. Forecasts assume that the profits will be 40 million US dollars. Particularly interesting: Meanwhile, CEO Siemiatkowski fears that AI will soon take over his job - and is not happy about it.

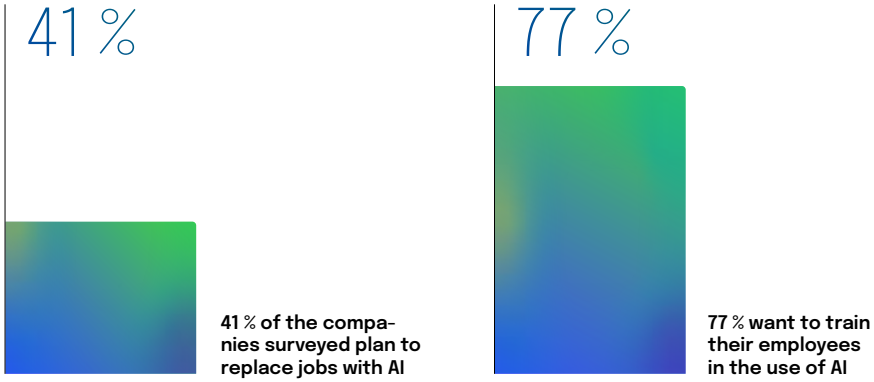
TRENDS – PART 1

Impact on the labor market

Examples such as that of Klarna suggest that the global market for AI agents is expected to grow at an average annual rate of 45.1 % to a volume of 50.31 billion US dollars by 2030. As a result, agentic AI is not only changing the productivity of companies, but also the labor market, as various studies show. McKinsey expects AI agents to contribute significantly to generating up to $4.4 trillion in more than 60 generative AI use cases in general. AI agents (and supporting technologies) could automate 60 to 70 % of working hours in today's global economy.

These figures underscore that AI agents not only take over routine tasks, but will also have a significant impact on employment. Microsoft is even already advertising that companies that invest in AI tools such as agents will need fewer employees in the future. Their biggest advantage over human employees is their arbitrarily and cost-effectively scalable number: telephone agents schedule appointments, answer inquiries, and thus support, for example, freelancers in communication. Customer service agents can, e.g., modify customer data, respond to emails in different languages, and collaborate with other specialized agents, such as those for billing. Sales agents can summarize emails, research product information, and shorten the processing time of customer inquiries. In the field of software development, AI agents can create or optimize program code based on simple instructions. And recruiting agents find suitable candidates, organize interviews, and promote diversity by specifically encouraging potential applicants.

The examples underpin why AI agents are at the center of strategic planning for AI companies. Like no other technology, they can counteract the shortage of skilled workers. Therefore, their rise does not necessarily mean that people will become superfluous en masse. A study by the World Economic Forum shows that 41 % of the companies surveyed plan to replace jobs with AI. At the same time, 77 % want to train their employees in the use of AI. By 2030, 170 million new jobs are expected to be created through technologies, while 92 million will be eliminated, resulting in a net growth of 78 million jobs.



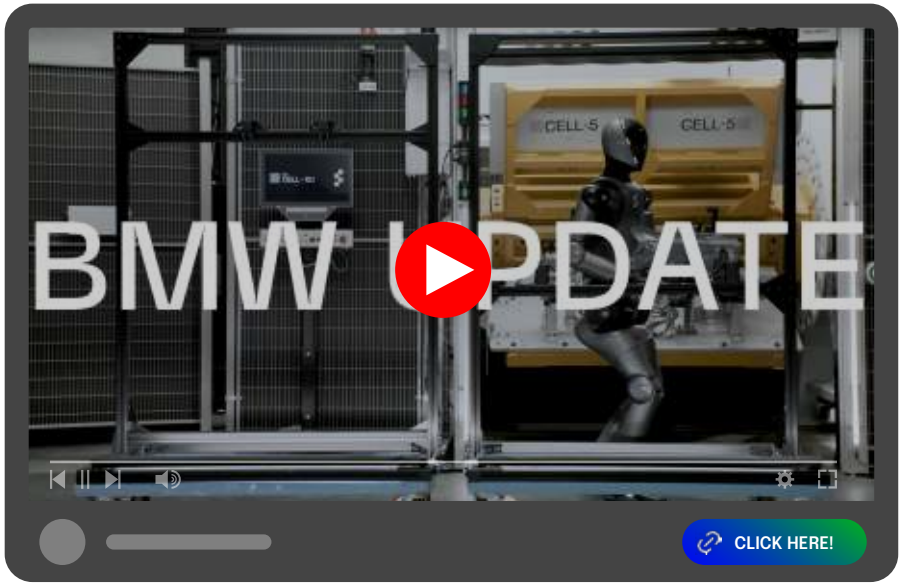
One reason: With the demand for agents, the need for new skills is also growing. Roles such as those of AI trainers and system monitors are becoming more important. But what exactly the division of labor of the future will look like depends largely on legal and ethical considerations.

TRENDS – PART 1

The future of work

The expected disruption in the labor market is accompanied by challenges such as hallucinations, energy consumption, and ethical concerns. The development of responsible AI agents requires robust regulatory frameworks and interdisciplinary collaboration. Companies need to ensure that their AI solutions are ethical and secure - especially when they also operate in the physical world. The so-called embodied agents offer completely new possibilities when it comes to automating manual jobs and repetitive work, such as on the assembly line.

Samsung, Nvidia, and Siemens are fighting for dominance in robotics. Samsung relies on collaborative robots and humanoid robots for home use. Nvidia focuses on software platforms for simulating and optimizing robot fleets, while Siemens develops platforms for automated guided vehicles with Simove and offers manufacturer-independent fleet management. Scientists at the Fraunhofer IPA see Nvidia's new AI robot platform in particular as a great opportunity for the competitiveness of German companies. Until then, some progress in robotics is still necessary, but the AI robotics startup Figure is already showing impressive progress at BMW. And China is also playing at the forefront: The company UBTech plans to complete mass production of its Walker-S series humanoid robots by the end of 2025. Between 500 and 1000 robots are to be delivered to various industrial customers.



Despite the many open questions that still need to be answered, one thing is clear: AI agents are here to stay. The way we work will change fundamentally - an exciting challenge for everyone involved.

Expert Quote

Trend #01

AI TRENDS REPORT 2025

“A takeover of jobs by AI agents will not happen in the mid-sized business sector. I rather believe that AI agents will reduce current efforts. The freed-up capacity will be used, on the one hand, for the operation and further development of AI agents, and on the other hand, for additional tasks arising from increasingly complex market dynamics and competitive environments.”

Albert Heim

Head of Digital Transformation
Hochland Deutschland GmbH

Expert Quotes

Trend #01

AI TRENDS REPORT 2025

"AI is a powerful yet not perfect tool for us. The human-in-the-loop approach allows us to implement innovation quickly with a manageable risk."

Henry Byers

Head of Data & Advanced Analytics
Zurich Insurance

"It is unlikely that the widespread introduction of automated AI agents will lead to major unemployment in 2025. Rather, German companies will be less occupied with downsizing and more with reskilling and introducing new AI-centric roles."

Sedad Avdic

Digital Strategy Advisor
Corporate Development
TÜV Rheinland AG

Expert Quote

Trend #01

AI TRENDS REPORT 2025

“Low-risk tasks with minimal consequences for errors, like hotel table booking or appointment scheduling, will increasingly be automated with human oversight ensuring quality. Companies seeking higher productivity are more likely to shrink the workforce than eliminate it, focusing on doing more with fewer employees.”

Deepak Pai

Principal Scientist Adobe GenStudio
Adobe

Expert Quotes

Trend #01

AI TRENDS REPORT 2025

"While unimaginable for many German companies that AI agents take over tasks, at others, it's already happening. The digital/AI divide between companies will grow even bigger. AI literacy including the human factor will continue to be a crucial competitive advantage for firms."

Prof. Dr. Elisa Konya-Baumbach

Co-Founder & Managing Director
humest GmbH

Professor of Consumer Psychology & Behavior, Bern University of Applied Sciences

"AI verticalization is transforming the market: Tailored AI agents are gaining importance and enabling new business models. Competition is intensifying, and companies need to become more agile to meet industry-specific demands. Those who invest in specialized AI solutions are securing a successful future."

Marcel Isbert

Co-Founder & COO
AI Hub Frankfurt

Expert Quotes

Trend #01

AI TRENDS REPORT 2025

"Autonomous AI agents will increase speed, reduce costs, and make German companies more competitive. I don't see a significant reduction in jobs due to AI agents. Instead, they could relieve human workers and enable them to focus on more creative and strategic tasks."

Michael Schorpp

Head of Digital Innovation & AI
Boehringer Ingelheim

"As seen in international companies last year, autonomous agents will claim their first jobs in Germany this year. This won't always mean direct replacement–sometimes, it will simply mean fewer new hires. Like it or not, the age of AI-driven workforce transformation has arrived!"

Michael Berns

Director for AI
PwC

TRENDS – PART 1

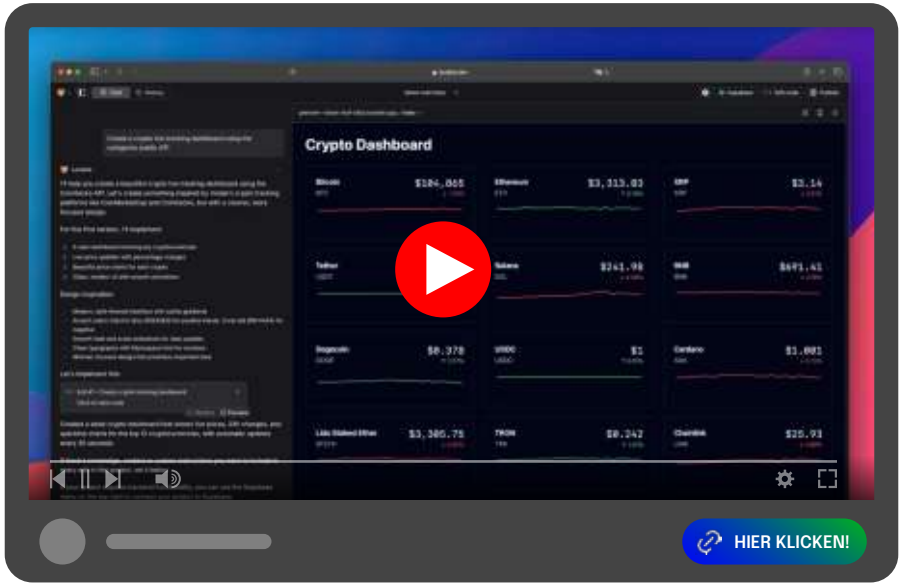
TREND 2

Low-code and no-code democratize software development

In 2025, software development is at a turning point: thanks to low-code and no-code tools, even laymen can create complex software and apps. This democratization of software development promises not only higher productivity, but also a fundamental change in the way we develop and use digital solutions.

Simple solutions for complex problems

The shortage of skilled workers and the chronic overload of IT departments are putting pressure on companies that need to accelerate their digitization. A „perfect storm“ for providers of low-code and no-code solutions, which are enjoying ever-increasing demand. Coding tools such as Cursor, an innovative AI-powered code editor, and Blackbox AI, a powerful AI coding assistant, achieve impressive levels and are immense productivity boosters. Like, for example, GitHub Copilot, these tools significantly support developers in more complex tasks. Salesforce has already announced that it will no longer hire new developers. Also particularly noteworthy is GitHub Spark, an AI-powered tool that allows you to create and share micro-apps. The so-called Sparks are tailor-made solutions that can be used directly from the desktop or mobile device - without developers having to write or deploy code.



In this video we show how to create a dashboard that tracks the valuation of multiple cryptocurrencies using live data from the CoinGecko Public API, without requiring any programming knowledge. We use Lovable's no-code full-stack agent. Lovable successfully and flawlessly created the dashboard in a single run in less than 15 minutes.

Another example is HP AI Studio, a platform developed by HP and NVIDIA that simplifies and accelerates the process of building and managing AI models. These tools are not just for programmers. They open the door for a wider user base to maximize their capabilities with AI. The concept, which is also behind the low-code platform Microsoft Power Platform, is called “Citizen Development”. It enables employees without an IT background to independently develop solutions for business problems of all kinds.

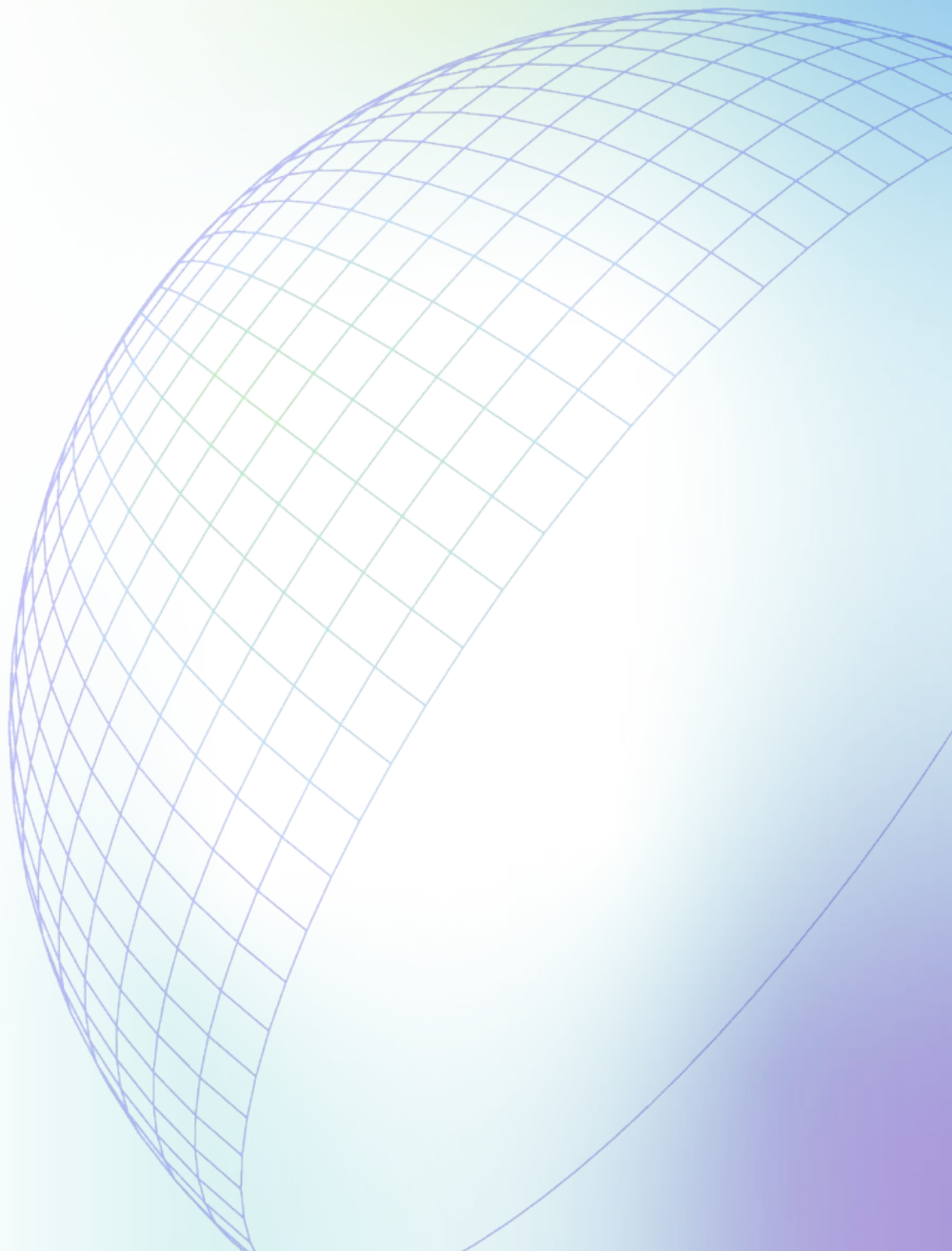
TRENDS – PART 1

Democratization or over-reliance on tools?

The effects of this development are already visible. Experts predict that the low-code market will grow exponentially. Gartner estimates that by 2025, over 70 % of application development will be low-code based, compared to just 20 % in 2020. By 2027, the tech research firm predicts a low-code market of $16.5 billion, with an average annual growth rate of 16.3 % through 2027. Forrester Research even believes growth to $50 billion by 2028 is conceivable. 87 % of developers in companies already use low-code development platforms for at least part of their development work.

While the benefits of these tools are obvious, there are also concerns. Critics warn of a possible over-reliance of young developers on the tools. It should not lead to neglecting basic programming skills and critical thinking. It is also unclear how code tools will affect the quality of code in the long run if their use introduces more errors than human-written code.

Despite these concerns, curiosity and optimism prevail in the developer community. AI is seen as a means of improving productivity that could fundamentally change the way software is developed. However, companies need to ensure that these tools do not replace professional experience and training. The balance between innovation and respect for tradition remains a central challenge.



Expert Quote

Trend #02

AI TRENDS REPORT 2025

“With AI driven simplicity and the assistance of AI agents, software development becomes a canvas where anyone can paint their ideas into reality. The power to innovate, swiftly, is yours.”

Elika Shahmohammadi

IT Director | Digital Consumer Experience & Innovation
Beiersdorf

Expert Quotes

Trend #02

AI TRENDS REPORT 2025

"Low-code and no-code tools, combined with AI agents, are democratizing software development. These technologies enable almost anyone to create apps and solutions quickly, transforming workflows and empowering teams to focus on solving business challenges with greater efficiency."

Dr. Marc Jäger

Team Lead - Data Analytics & AI
BASF SE

"In the unnoticed backdrop, Agentic AI is quietly dismantling the gates of software engineering. What once took months now takes days. What required teams now needs your instructions. Code is no longer king - by 2025, agentic AI will navigate the entire development lifecycle, turning vision-holders into instant architects."

André Monaco

Head of AI Innovation
statworx

TRENDS – PART 1

TREND 3

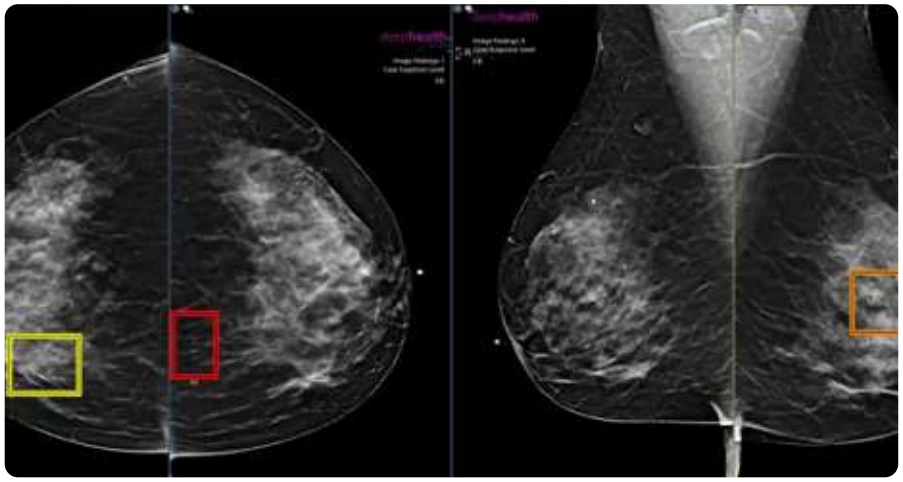
AI achieves its first big scientific breakthrough

2025 will be a year of scientific innovation. Artificial intelligence is at the center of a revolution that is fundamentally changing fields such as medicine, materials research, and climate science. With impressive advances in research and technology, it is becoming clear that AI is not only acting as a tool, but increasingly as a co-scientist - and perhaps will soon make its own scientific breakthrough?

Medicine: Personalized therapies and revolutionary diagnostics

AI has already ushered in a new era in medicine. The Mainz-based company BioNTech is driving the development of personalized cancer therapies with the help of AI. Following the acquisition of InstaDeep and the introduction of the Kyber supercomputer, the company is significantly accelerating drug development. Back in May 2024, Google DeepMind introduced AlphaFold 3, a system that can accurately predict protein structures as well as their interactions with DNA, RNA, and ligands. These advances have far-reaching implications for the development of new therapies and the fight against complex diseases.

Numerous other examples show what is possible with the help of AI: for example, the early detection of breast cancer in mammograms. In a US study, an AI improved the cancer detection rate by 21 %, allowing for faster treatment. Another example of the efficiency of AI is shown in a study in which ChatGPT outperformed human physicians in diagnostics. Even with minimal human support, the AI-powered chatbot achieved amazing results. This development underscores how AI is not only optimizing diagnoses, but also redefining the role of physicians.



The example shows how a suspected case of breast cancer was detected during mammography thanks to AI (Image: Radiological Society of North America (RSNA) and DeepHealth).

A study by Harvard Medical School and Stanford University also points in the same direction. It investigated how well OpenAI's o1-preview AI model makes medical diagnoses. The model outperformed both older AI models and experienced physicians in diagnosing complex cases. It achieved the correct diagnosis in 78.3 % of cases and showed superior clinical reasoning. The AI system also performed better in treatment decisions.

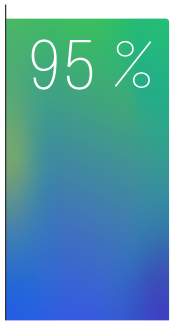
TRENDS – PART 1

Scientific research: Faster, but less creative?

Researchers using AI currently see the technology as a process accelerator to process large amounts of data more efficiently. However, AI continues to rely on their human expertise. However, studies already show that those who use AI publish more studies, are cited more often, and reach leadership positions faster. But one study also warns that this research tends to focus on narrower topics, while groundbreaking, creative approaches take a back seat. James Evans of the University of Chicago speaks of a "lack of imagination" and calls for slowing down the shift to AI-powered research in order not to lose alternative approaches.

A global survey of nearly 3,000 researchers shows:

72 % expect AI to have a significant impact on their field



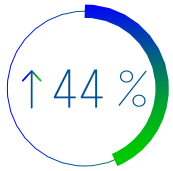
95 % believe that AI accelerates knowledge discovery

At the same time many express concerns: misinformation, critical errors, and the loss of critical thinking are major challenges.

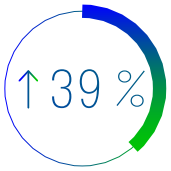
Materials science: New materials, developed faster

Materials research is experiencing a true renaissance thanks to AI. Google's AI tool GNoME discovered over 380,000 stable materials in 2023 that could support the development of more efficient energy sources such as batteries and solar cells, as well as superconductors. An MIT economist's study shows that using AI in materials research can increase development time by 44 % and patent filings by 39 %.

AI in materials research can increase development time by 44 % ...



... and patent filings by 39 %



But there are also downsides here: creative tasks are increasingly being taken over by machines, which has been shown to reduce the job satisfaction of researchers.

Climate change and space research: AI as a problem solver?

In the fight against climate change, the German Aerospace Center relies on AI to more accurately predict the consequences. High-resolution satellite-based observational data improves understanding of atmospheric processes and land-ocean interactions. These findings feed into existing Earth system models and increase their accuracy.

Meanwhile, Chinese researchers have developed an AI-powered catalyst that can produce oxygen using materials from Mars. This process saves an estimated 2,000 years of human labor and demonstrates the efficiency of AI in overcoming technical challenges. And Google DeepMind has introduced GenCast, an AI model that provides more accurate weather forecasts than the European Centre for Medium-Range Weather Forecasts in 97.2 % of cases and is particularly good at predicting extreme weather, which could be critical for renewable energy planning.

Outlook: AI as a co-scientist of the future

The list of scientific achievements through AI is getting longer and longer. From detailed brain atlases to flood forecasting to fusion reactors, AI is driving innovations that were once unthinkable. The progress is also reflected in the startup sector: Cradle, a platform for protein engineering, uses machine learning to accelerate the development of improved protein variants. Sonia is a platform for AI-powered cognitive behavioral therapy (CBT) that works like conventional talk therapy, but where you talk to an empathetic voice on your smartphone instead of human therapists in an office. PaliGemma 2 is an open-source vision language model from Google that improves the analysis and interpretation of visual and linguistic data, e.g. B. from X-ray images.

These breakthroughs manifest the notion of self-improving AI that has been discussed for decades. An AI that can conduct AI research independently could become a reality as early as this year. A milestone on the way is, for example, Sakana's AI Scientist, which carries out the entire research process autonomously, from literature research to the publication of research results. Agent Laboratory, an open-source framework from AMD and Johns Hopkins University, combines human ideation with AI-powered workflows to accelerate ML research. The process involves three phases: literature search (PhD agent), research planning (PhD and postdoc agents), and experiment execution (ML engineer agent). Another significant milestone would be the acceptance of a research paper written by an AI at a conference.

Expert Quote

Trend #03

AI TRENDS REPORT 2025

“In 2024, artificial intelligence has already made a significant contribution to winning the Nobel Prize in physics and chemistry, thus massively advancing developments in health. There is more to come.”

Christian Wrobel

Chief Data Architect
Fraport AG

Expert Quotes

Trend #03

AI TRENDS REPORT 2025

"The fusion of AI and research opens up new horizons that have been pursued for years. With GenAI and intelligent agents, we are not only accelerating the research process but also redefining scientific progress. This marks the beginning of an era where innovation and knowledge grow at an unprecedented pace."

Sarah Lewandowski

Global Head of Technology,
Innovation and Co-lead GenAI Catalyst
Bayer

"Despite advances in areas such as image and video segmentation, scientific breakthroughs remain complex and time-consuming. AI is driving automation and data analysis, creating the basis for transformative developments. The thesis is therefore less a prediction than an inspiration to develop the potential of AI responsibly."

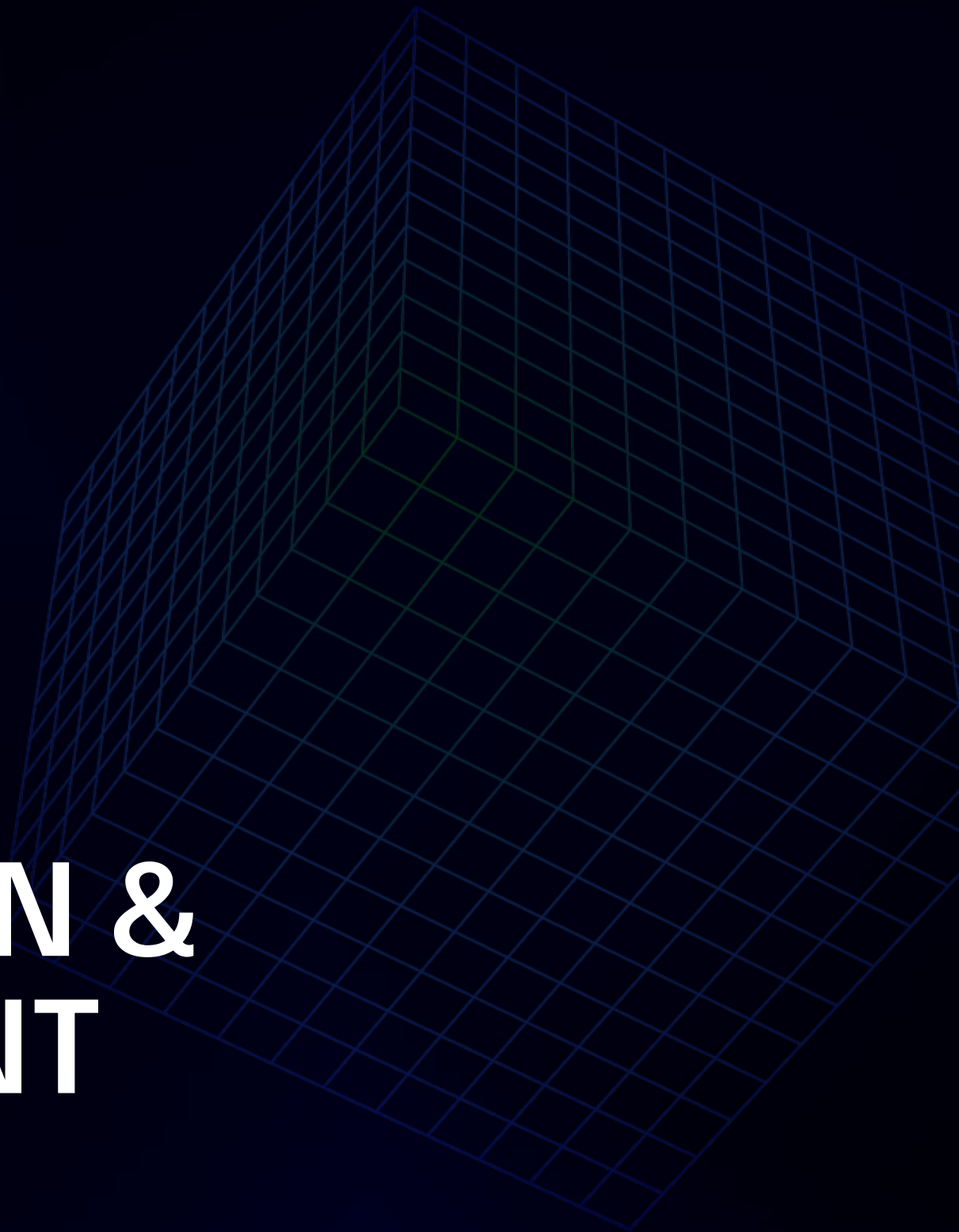
PD Dr. Florian Grimm

Physician in Neurosurgery
University Hospital Tübingen

02

TRENDS – PART 2:

REGULATION & INVESTMENT



TRENDS – PART 2

TREND 4

Tech giants release “AI light versions” for the EU market

The AI Act is in force and shows concrete effects in interaction with the General Data Protection Regulation (GDPR). Large tech companies are restricting the availability of their products and services in the EU, massively delaying releases, or even completely foregoing launches:

Apple will not make its AI features available on iPhones in the EU until April 2025. Apple Intelligence features then available will include AI-powered writing tools to improve texts, ChatGPT integration, a new version of Siri, and the ability to create custom emoji symbols through voice prompts.

OpenAI has already waived an EU release for its new AI video generator Sora, which was released as a standalone product with its own user interface. Sam Altman explicitly cited EU AI regulation as the reason. In his message on X, he does not rule out that this will apply to all OpenAI products with immediate effect and that some may not be offered in the EU at all.

Meta will not offer its new multimodal Llama 4 model, nor future models, in the EU. This also affects its AI assistant Meta AI and products such as smartphones and smart glasses, in which these models are to be integrated. Meta cited “the unpredictability of the European regulatory landscape” as the reason. In particular, the GDPR. Non-European services based on Llama may also not be offered in the EU.

Tencent from China excludes the EU from its open source model Hunyuan Video. Hunyuan Video is currently the text-to-video model with the most parameters (13 billion) and the highest performance available in the open source domain, which ensures high physical accuracy and scene consistency.

Google is under investigation by the Irish Data Protection Authority, which is leading to restrictions or delays in the introduction and use of Google‘s AI products in the EU. In particular, products based on AI models such as the Pathways Language Model 2 could be affected if privacy concerns are not addressed.

With the introduction of the AI Act in August 2024, the EU created a comprehensive framework for AI regulation.

Margrethe Vestager, former EU Commissioner for Competition, stressed that the European approach puts people at the center and protects the rights of all. The rules are based on four risk levels, with most AI systems classified as low risk. AI systems with „unacceptable risk", such as social scoring systems or emotional recognition, are prohibited. General purpose AI models such as GPT-4 will be regulated from August 2025. By mid-2026, all regulations will enter into force, including those for high-risk AI. Limited-risk systems must be transparent, e.g. by labeling chatbots and deepfakes. In case of non-compliance, companies face fines of up to 7% of their annual global turnover.

AI Act and GDPR as growth brakes for Europe?

The AI Act pursues a risk-based approach that aims to categorize AI applications according to their risk potential and create strict requirements for dangerous systems. These regulations also apply to companies outside the EU whose AI systems are offered in the EU. The interesting thing about this is that Google, Microsoft, and OpenAI, as well as Amazon, were among the over 100 initial signatories of the EU AI Pact. In it, they declared that they would voluntarily apply the principles of the AI Act before it entered into force and pursue three core measures:

1. **Development of an AI governance strategy**
2. **Identification of high-risk AI systems**
3. **Promotion of AI competence of employees**

More than half of the signatories also pledged steps such as human oversight and labeling of AI content. Although two important players, Apple and Meta, were already missing from the list of signatories at the time, both companies expressed concerns about high-security rules, data disclosure, and the collection of user data for AI training. Now the problems are also becoming apparent for other companies. A study commissioned by the Bertelsmann Stiftung shows that the AI Act is intended to complement sectoral regulations and other digital laws as an overarching legal framework, but is not optimally aligned with them. Many AI applications that fall under the regulation are already regulated by other regulations such as the GDPR or the Digital Services Act (DSA).

There is a particular tension between the AI Act and specific requirements in areas such as finance, medicine, and the automotive industry. Therefore, experts are calling for better coordination of the regulations.

At least as far as data processing is concerned, the EU has now found a uniform regulation. The EU data protection officers allow the processing of personal data by AI models if there is a „legitimate interest". This means that Meta, Google, OpenAI & Co. can invoke this very interest for the processing of personal data of their AI models. However, the permission is linked to conditions that are checked by a 3-stage test:

1. **Legitimacy**
2. **Necessity**
3. **Balancing of fundamental rights**

TRENDS – PART 2

In principle, data may only be processed anonymously in order to prevent the identification of individuals. The next few months will show how companies and governments will shape the implementation. That the AI Act will also serve as a model globally must be doubted in view of its deterrent effect.

AI regulation from a global perspective

Not only the EU, but also many other regions and nations have developed frameworks for the responsible use of AI. In the USA, industry-specific guidelines such as the SR 11-7 standard, originally developed in the financial sector for risk control, are an example of indirect regulation of AI. At the federal level, there are efforts to create standards, such as through the principles articulated in the Blueprint for an AI Bill of Rights. Canada has the Artificial Intelligence and Data Act (AIDA) in the works, which focuses in particular on regulating automated decision-making systems and emphasizes ethical principles. China has introduced comprehensive regulations for AI-powered algorithms to prevent abuse and discrimination, and requires companies to disclose how their systems work and what their goals are.

Overall, global AI regulation is highly fragmented. There are neither uniform definitions of AI nor uniform forms of regulation. From binding law (EU) to principles (UK) to a mix of federal and state regulations (USA), everything is included. Many regulations are also flexible, which poses challenges especially for internationally active companies. The overlaps with other areas of law such as data protection, competition and intellectual property make compliance even more difficult for companies.

Expert Quote

Trend #04

AI TRENDS REPORT 2025

“Offering light versions simply to circumvent regulatory hurdles is not our goal. We ensure compliant solutions meeting strict regulations, integrating measures into products for EU customers. Adopting GDPR as our global standard, we prioritize transparency, accountability, and data protection, supporting innovation and trust.”

Agnes Heftberger

Chairwoman of the Management Board & CVP
Microsoft Germany

Expert Quote

Trend #04

AI TRENDS REPORT 2025

“Light versions may overcome regulatory hurdles, but they risk losing innovation and competitive edge. Bold strategies are needed to combine compliance with top performance.”

Dr. Michael Drass

Chief Expert AI
Deutsche Bahn AG

Expert Quote

Trend #04

AI TRENDS REPORT 2025

“The AI Act is intended not only to enable transparency and security in dealing with AI but also to secure trust and competitive advantages for European AI solutions. However, can this regulatory system prove itself in the global market? Start-ups, in particular, face bureaucratic challenges, and there is a growing call for adjustments to the AI Act.”

Julius Heinz

CFO
statworx

TRENDS – PART 2

TREND 5

The AI investment bubble bursts

The AI industry experienced an unprecedented investment boom in 2024. Companies such as OpenAI and Anthropic received billions in funding, some even without clear evidence of a viable business model. And investment, especially in generative AI, continues to rise. Ali Ghodsi, CEO of Databricks, calls the current situation a bubble, as companies receive high valuations without substance. Databricks itself secured $10 billion at a $62 billion valuation. Originally, 3 to 4 billion were planned, but investor interest was enormous.

While there were already voices last year that predicted it and were wrong, 2025 could really see this bubble burst. Many of the current AI startups are struggling to deliver sustainable value - a development reminiscent of the dot-com bubble of the early 2000s. However, if this were to happen, industry experts also see opportunities in this development. A potential market shakeout could create room for solid startups that are characterized by sustainable business models and innovation.

Discrepancy between investment and revenue

The discrepancy between the massive investments in AI infrastructure and actual revenue poses a significant economic challenge. Companies such as Nvidia and OpenAI continue to face the question of how to realize the expected revenue. Although these players dominate the market, they also (still) lack widespread AI products that provide real benefits. It is precisely at this point that the danger of a speculative investment bubble intersects with the actual potential for long-term value creation. In which direction it ultimately goes cannot be predicted with certainty. However, it is known from the past that new technologies often attract significant investment and competition, which leads to price reductions - even if the technology is successfully and profitably deployed.

TRENDS – PART 2

Against the crash prophets, some experts argue that the high valuations of AI stocks are based on solid financial fundamentals and strong growth potential. While a few large companies dominate market capitalization, which poses a risk to investors, this can be mitigated by diversifying the portfolio. Smaller technology companies and traditional industries experiencing growth through AI developments offer attractive opportunities. In addition, emerging competitors could create new opportunities through innovation.

Focus on innovation and added value

A survey of 600 IT decision-makers in the U.S. shows that investment in generative AI increased sharply from $2.3 billion in 2023 to $13.8 billion in 2024. This represents a six-fold increase in spending. Currently, 60 % of investment comes from innovation budgets, while 40 % is funded from regular budgets.

Sequoia Capital, for example, has significantly increased its investment in AI startups. The share rose from 16 % in the previous year to almost 60 % in 2023.

Stephanie Zhan, a partner at Sequoia, highlights the importance of AI as an accelerator for businesses. Especially in the early investment stage, there is an increase in AI startups, including in biotechnology, robotics, and autonomous vehicles. According to Goldman Sachs, tech giants plan to invest more than a trillion US dollars in AI in the coming years.

Interestingly, price and adoption rate play a secondary role in the choice of AI solutions. Instead, companies focus on measurable added value and the adaptability of tools to industry-specific requirements. With code copilots as the most common use cases, it is clear that practical and specialized solutions will continue to pave the way into the future of AI.

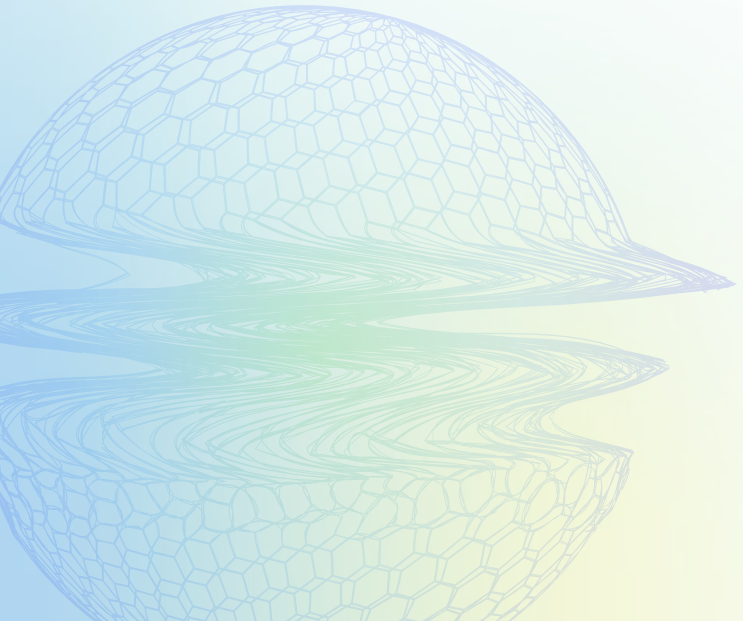
Nevertheless, the profitability of this spending remains controversial. Economist Daron Acemoglu predicts that AI will only marginally increase labor productivity and GDP in the U.S. over the next decade. Joseph Briggs of Goldman Sachs, on the other hand, expects AI to automate 25 % of all work tasks, which would increase productivity by 9 % and GDP growth by 6.1 %.

Challenges: Power demand and resources

Bottlenecks in chips and power supply could prove to be the physical limits to truly widespread value creation with AI. Analysts at Goldman Sachs expect demand for AI chips to outstrip supply. Problems with high-bandwidth memory and specialized chip packaging technologies, as well as increasing power demand, could hamper growth. In Virginia, a core region for data centers, there is already a significant increase in power consumption. In Europe, too, electricity demand could increase by 40 to 50 % by 2030, which in turn would benefit electricity grids and renewable energies.

TRENDS – PART 2

So which way is the wind blowing? The truth is, no one really knows. Whether there is an AI bubble at all is debatable. However, it is not unlikely that 2025 will see unrealistic expectations corrected, while AI continues to grow strongly in the long term.



Shortly before the editorial deadline, the Chinese AI startup DeepSeek caused a seismic tremor in the AI landscape.

The consequences are noticeable: Nvidia's market value slumped by $600 billion after R1's launch, Meta set up crisis teams, and companies like Perplexity are integrating the cheaper model. But despite the "Sputnik moment" - compared to the Soviet technological lead in 1957 - the race is not decided and the bubble hasn't burst yet. Experts argue that R1 is not a technical breakthroughs, but a smart combination of known methods. While it demonstrates China's ability to innovate under sanctions, long-term hurdles remain: China's chip shortages due to U.S. export restrictions could block future scaling, especially since success is based on Nvidia chips hoarded before sanctions. In addition, DeepSeek's open-source strategy is likely tactically motivated – the Chinese government could restrict openness again as part of the "fang-shou" cycle (phases of easing and control). While R1 shows that AI advances are possible even with limited resources, U.S. dominance in hardware and ecosystem remains intact. The real lesson lies in the Jevons paradox: increasing efficiency could cause AI demand to explode - ultimately benefiting chipmakers as well, as long as they adapt to the new era of adaptive, cost-sensitive models.

Expert Quote

Trend #05

AI TRENDS REPORT 2025

“The year 2025 will be the year of truth: Following the extensive investments in AI over the past few years, it will become clear which companies successfully transition from experimentation to creating real value. Humans will play a key role in this, as they are the ones who will benefit from the added value.”

Daniel Kapffer

COO
DekaBank

Expert Quotes

Trend #05

AI TRENDS REPORT 2025

“Whether the AI investment wave causes a bubble depends on the effective management and alignment of investments towards genuine value. Finance & Accounting play a central role in this by creating transparency, assessing risks, and ensuring strategic sustainability.”

Fatih Esir

Head Of Accounting
FreeNow

“I am convinced that we are not in a bubble. Rather, we do not yet fully grasp the true magnitude of the AI revolution; we are facing tremendous upheavals in society and the economy. Course corrections in the stock market, triggered by technological leaps such as DeepSeek, are a separate issue.”

Marcel Plaschke

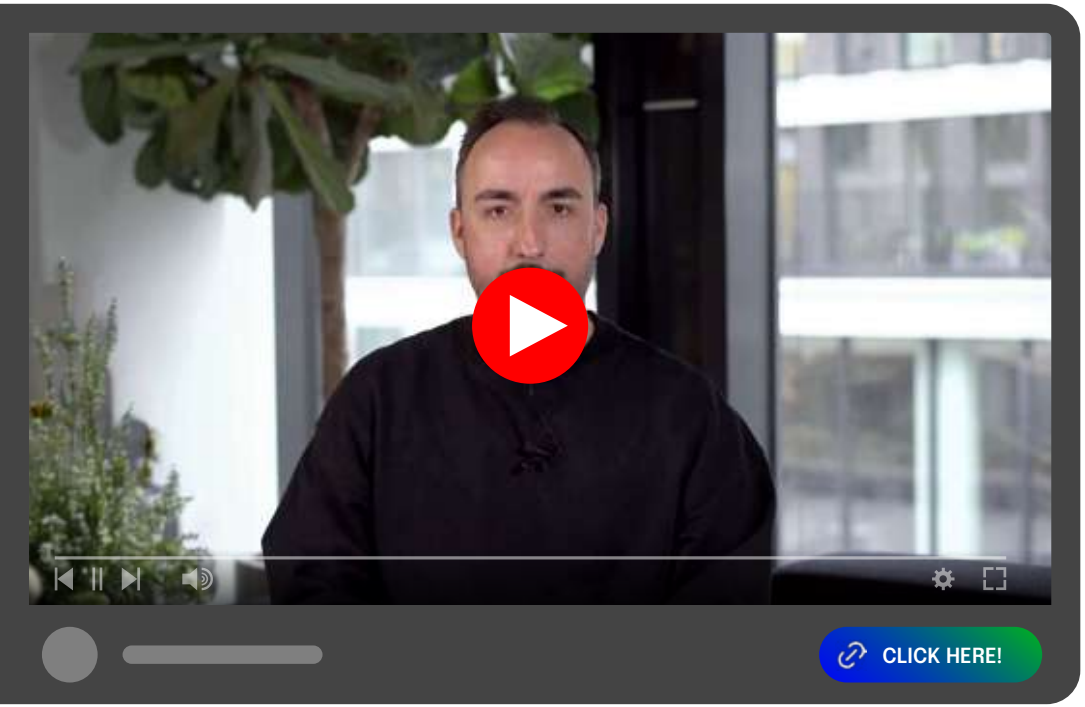
Head of Strategy, Sales, Marketing
statworx

TRENDS – PART 2

TREND 6

AI avatars shape new creative and ethical standards

Voice cloning, generative video AI, and multimodality: The avatar of Sebastian Heinz, founder and CEO of statworx, created by us, explains where the journey will go.



Especially in entertainment, media, and the creative industries, these technologies are on everyone's lips. They open up unprecedented possibilities, with tools like Synthesia or HeyGen, to create digital clones that take on the gestures, facial expressions, and voice of the human model. At the same time, these new possibilities raise serious questions about ethics, security, and regulation. Are such avatars deepfakes? If so, who is allowed to use them under what conditions? And what exactly is the situation with copyright here? Organizations such as the World Intellectual Property Organization are already working on new legal frameworks for digital creations.

Avatars as digital representatives?

Voice cloning and generative video AI enable the creation of realistic digital avatars that are increasingly being used in marketing, entertainment, and education. A prominent example is the AI-generated influencer Lil Miquela, who inspires millions of followers on social media.

TRENDS – PART 2

An impressive experiment that took place in Lucerne comes from a completely different direction: An AI-generated Jesus avatar interacted with visitors in St. Peter's Chapel. The avatar, which was trained with content from the New Testament, was intended to create moments of intimacy and was able to communicate in 100 languages. Although the answers of "AI Jesus" were often formulaic, many visitors perceived the interaction as a spiritual experience. Projects like this show how versatile digital surrogates can be used, but also raise ethical questions.

Will we soon send our avatar to the meeting when we are sick or on vacation? Eric Yuan, CEO of Zoom, would prefer to send a digital version of himself to meetings already so he can go to the beach. On Zoom, you can already create human-like AI avatars that can even answer questions in real time and at least partially represent their human counterparts.

The German startup tldv also offers avatars for various meeting tools that create recordings, personalized summaries and reports, and answer questions about conversations - whether you were connected to Teams, Zoom, Slack or Google Meet. The German open source platform Nextcloud is working on avatars that schedule appointments and write email drafts.

Microsoft plans to introduce a feature in Teams early this year that allows users to clone and translate their voice in real time in nine languages. The so-called interpreter agent is intended to make meetings more personal, but carries risks: misuse by deepfakes could compromise sensitive data.

One thing is clear: demand for natural language processing technologies is increasing - forecasts suggest the market could reach a volume of $35 billion by 2026.

TRENDS – PART 2

Creativity and competition: AI in music and film

The creative industry is experiencing a comparable disruption. AI-generated music is causing discussion on platforms like Spotify. Virtual bands like Jet Fuel & Ginger Ales achieve high streaming numbers, but are criticized for contesting revenue from human artists. While Spotify plans to label this content, critics warn of „copyright laundering“ as AI models often access existing works without permission.

The film industry is also increasingly using AI: The film studio Lionsgate (The Hunger Games, John Wick, American Psycho) is cooperating with the start-up Runway to use AI tools in pre-production and post-production. These help with storyboarding, special effects, and editing. Studios such as Disney and Paramount are considering similar collaborations, because the technical possibilities of multimodal AI, which combines text, images, and video, are already impressive.

Platforms such as Sora and Pika Labs allow users to create high-quality videos from simple text input as well as now based on image and video input. The latest version 2.0 of Pika's video generator has a feature called „Scene Ingredients“ that allows you to incorporate your own images into AI-generated videos. Google has also introduced two new AI models: Veo 2 and Imagen 3. These models achieve top performance in video and image generation. Veo 2 is capable of creating videos in 4K resolution, understands cinematographic instructions, and minimizes unwanted detail. Imagen 3 is particularly good at depicting different art styles. These new possibilities raise – not unjustified – concerns among screenwriters, actors, and other artists and creatives that they could soon be replaced by AI. In Hollywood, there are many indications that the efficiency gains from AI could prevail over union interests in the long run.

When AI meets poetry: „Dreams“ by IN-Q, cinematically staged by Wayne Price – a poetic short film with a documentary retro look and subtle fantasy elements.

TRENDS – PART 2

A world in transition

One thing is clear: multimodality, generative video AI, and avatars will fundamentally change art, creativity, media, the world of work, and also the way we communicate. The technologies enable ordinary users to create high-quality multimedia content. This threatens the position of creatives and also opens up new possibilities for disinformation through fake videos that are difficult to detect. Developers are working on watermarks and other identifiers to curb abuse. But appropriate global regulation is needed here to ensure the responsible use of such technologies.

Google's PaliGemma 2 model, for example, has the ability to recognize emotions in images. As a high-risk system under the AI Act, the technology is largely banned in the EU, partly because it is very error-prone. Emotion recognition carries significant risks, such as bias against certain, mostly marginalized groups, and misuse in sensitive areas such as schools or the workplace. However, exceptions apply, for example, to border control authorities. The US Department of Defense, for example, is investing in deepfake detection from startup Hive AI. Thanks to advanced pattern recognition, fraudulent, disinformation AI-generated content can be identified - a technology that is critical not only for national security, but also for civilian institutions. However, detection remains imperfect, and attackers could find ways to circumvent the systems.

In hardly any other trend do exciting opportunities stand so closely alongside catastrophic misuse scenarios. In order to exploit the positive potential of AI without neglecting the enormous risks, a clear legal situation with fixed limits is needed - embedded in a broad public discourse on the ethical issues behind it. Because who knows: Maybe this year a multimodal AI system will already pass the Turing test for language, i.e. communicate in such a way that it is indistinguishable from a human.

Expert Quote

Trend #06

AI TRENDS REPORT 2025

“AI Avatars for training and communication need clear rules and guidelines to safeguard the trust that is necessary for their successful use – both internally and externally.”

Dr. Jean Enno Charton

Director Digital Ethics & Bioethics
Merck KGaA

Expert Quotes

Trend #06

AI TRENDS REPORT 2025

"Voice cloning and video AI make AI avatars realistic portrayal of individuals, creating new possibilities from gaming via customer services to advertisement. But blurring the line between reality and fiction amplifies ethical and legal concerns about privacy, IP and misuse. Transparency and responsible AI rules are crucial to mitigate risk."

Catharina Glugla

Partner - Data, Cyber & Tech
A&O Shearman

"AI avatars are redefining the boundaries between reality and virtuality. The dialogue about their integration into businesses, education, and media, as well as their impact on our culture, should be conducted openly and inclusively."

David Sebastian Schlepps

Head of AI Academy
statworx

03

TRENDS – PART 3:

EDUCATION & DEVELOPMENT

TRENDS – PART 3

TREND 7

Article 4 of the AI Act promotes AI education in companies

From February 2, 2025, the EU AI Act marks a turning point for companies working with artificial intelligence. For the first time, mandatory AI training is being introduced. Companies and public authorities must ensure that their employees who use AI professionally have sufficient knowledge of how to handle AI. This includes a basic understanding of how AI works and its impact, as well as the ability to weigh opportunities and risks. Employers are obliged to offer appropriate training courses. This innovation, regulated by Article 4 of the AI Act, not only offers new opportunities, but also requires proactive measures from companies. Especially in Germany, the inadequate communication of the regulations is causing uncertainty.

Article 4: AI Literacy

> Providers and deployers of AI systems shall take measures to ensure, to their best extent, a sufficient level of AI literacy of their staff and other persons dealing with the operation and use of AI systems on their behalf, taking into account their technical knowledge, experience, education and training and the context the AI systems are to be used in, and considering the persons or groups of persons on whom the AI systems are to be used.

TRENDS – PART 3

Because Article 4 raises the question: What does “a sufficient level of AI literacy” mean? For the German newspaper FAZ, it means that users must be able to answer questions like these:

- What is an AI system?
- What does autonomy of AI mean?
- What use of AI machines is safe?
- What do you have to be careful about?
- How does good prompting work?
- What can AI help with?
- Where can it make mistakes?
- Where can the use of AI violate data protection, copyright and exploitation rights, or personal rights?

A wake-up call for the German economy

At present, it must be said that German companies are sleeping through the AI revolution. The problem: More than half of the 1,000 companies surveyed in a new study by the Stifterverband do not provide any learning opportunities. Only 25 % have a strategy for building AI skills. 86 % of the executives surveyed say that their company only exploits the potential of AI to a small extent. The main reason for this is that 79 % of employees lack basic AI skills. They neither understand how AI systems work nor can they assess their results from a technical point of view. In addition, almost two-thirds of employees show little interest in acquiring AI skills. The prospects for improvement by the new generation are bleak: only 28 % of companies cooperate with universities on the topic of AI. 82 % of executives criticize that students are poorly prepared for an AI-influenced working world.

Current figures from Bitkom also paint an alarming picture: 80 % of German companies do not yet have comprehensive training formats for AI. The EU AI Act provides for severe penalties for violations - up to 7 % of annual turnover or a maximum of 35 million euros. The requirements for the training obligation are so far only roughly outlined, which reinforces the urgency for clear guidelines. Lawyers emphasize that companies must at least be able to demonstrate that they have made serious efforts to meet their obligations. The legislator deliberately relies on an appeal character in order to motivate organizations to take responsibility.

TRENDS – PART 3

The path to better AI competence

AI competence is more than technical know-how. It encompasses a holistic understanding that takes into account opportunities and risks in equal measure, as well as legal and ethical dimensions. In addition, further training in the field of AI is not ticked off with one training session. It requires an approach that focuses on continuous learning in this highly dynamic field.

A modular training concept therefore offers a promising approach. It allows companies to specifically address the different needs of their employees:

- **Basic training**
  For all employees to create a broad understanding of AI.
- **Specific content for managers**
  Focus on strategic decisions and compliance.
- **Technical details for IT experts**
  Deeper insights into the functioning and implementation of AI.

In addition, internal guidelines, the appointment of an AI officer and regular training courses can help to increase competence sustainably.

Education as a competitive advantage

Companies that take the training obligation seriously benefit in several ways: they minimize legal risks, improve their compliance and create a corporate culture that rewards responsibility and safety in dealing with AI. More education also leads to better use cases, as employees develop a deeper understanding and can work more innovatively. This not only strengthens the market position, but also secures the advantages of proper AI use in the long term.

In addition, a recent survey by the World Economic Forum of 1,000 large companies concludes that around 39 % of all professional skills will be replaced by new requirements in the next five years - largely due to AI. For almost 60 % of all employees, this means that they will have to undergo further training by 2030 to meet the new requirements.

The AI Act sends clear signals: AI competence is becoming a decisive factor for the future viability of companies. Despite initial uncertainties, the obligation to train offers enormous opportunities for innovation and competitiveness. Companies should not see this change as a burden, but as a strategic opportunity to align their organization with the requirements of the future. Only in this way can they exploit the full potential of AI and at the same time ensure its responsible use.

Expert Quote

Trend #07

AI TRENDS REPORT 2025

“By 2025, people will be trained on AI by AI: The funny thing is that, on the one hand GenAI will contribute to accelerate training content creation and increase interactivity, while, on the other hand, the companies, implementing their AI strategy and compliance will fuel the need for training on AI. Ultimately, this leads to a self-fulfilling AI-prophecy.”

Philippe Coution

Head of Digital Interaction and AI Quality
TÜV SÜD

Expert Quotes

Trend #07

AI TRENDS REPORT 2025

“AI knowledge is currently a highly rare skill, the significance of which will only increase at all levels in the future. Identifying appropriate use cases requires a lot of sensitivity. Unreflective and careless use of AI carries significant risks. Sunk costs for failed initiatives are the least of the problems in such cases.”

Adrian Seeliger

Project Manager AI
DIN e.V.

“After the data protection officers, now come the AI officers, essentially the bureaucratization of innovation. Greetings from ISO9001 ;-)”

Andreas Wittke

Chief AI Officer
Institut für Interaktive Systeme | TH Lübeck

Expert Quote

Trend #07

AI TRENDS REPORT 2025

“To position Fraport for the future and remain competitive, we promote a fascination for AI and strengthen AI competencies. Only through acceptance and empowerment can our employees recognize the potential of the technology and thus develop more creative and effective solutions that meet the specific demands of their work areas.”

Verena Dollberg

Program Director | Corporate Strategy and Digitalization
Fraport AG

Expert Quotes

Trend #07

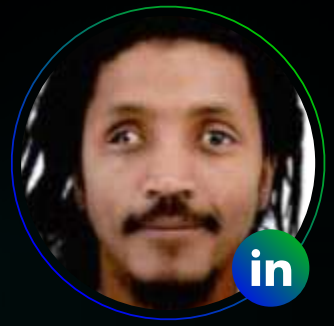
AI TRENDS REPORT 2025

"The EU AI Act was a catalyst for us to strategically anchor AI competencies – with a global learning program for all employees, a dedicated training for leaders, and soon role-based learning journeys for experts."

Tanja Gerum

Head of Global HR Development
TÜV Rheinland AG

"The focus on AI education should empower individuals with personalized learning, enhancing accessibility, and foster innovation. By democratizing AI, we bridge technological divides, enabling everyone to contribute to and benefit from AI advancements, ultimately driving societal progress and equitable opportunities for all."



Alberto Lobato Diogo

Senior Technical Trainer
Microsoft

Expert Quotes

Trend #07

AI TRENDS REPORT 2025

“Continuing education in AI means actively participating in shaping the future. It is not enough to merely recognize opportunities – it‘s about building skills through practical learning that turn ideas into reality. In this way, fear of change is replaced by enthusiasm for innovation.”

Jens Polomski

CEO
snipKI UG

“As Generative AI continues to advance, the challenge lies in the expertise gap: i.e., enabling multiple types of personas and roles necessary to solve end-to-end AI use cases. By fostering interdisciplinary education and collaboration, we can equip individuals with the necessary skills to leverage AI effectively that makes business sense.”

Jaume Masip

Lead Data Scientist, Team Lead EMEA
DataRobot

TRENDS – PART 3

TREND 8

Automated AI learning platforms democratize education

The growing presence of artificial intelligence in the educational landscape promises a revolution that could fundamentally change learning at all levels. At the center of the discussion are highly personalized learning platforms and automated content creation, which are intended to democratize education and make it individually accessible. But what opportunities and challenges does this change bring?

Education for all thanks to AI?

AI tools such as ChatGPT and highly customizable learning platforms and tools such as the research assistant NotebookLM, Duolingo Max, Podcastle and Scribe AI offer the possibility to personalize learning processes and adapt learning content to individual needs.

These tools create customized content that responds to the learning speed and interests of the learners. In developing regions, such platforms could revolutionize access to education. A promising example: The TeachAI initiative is developing guidelines for the safe and inclusive use of AI in education. It supports governments and schools in integrating AI into curricula, promotes equity in education, and provides a free toolkit for developing their own policies. Forecasts suggest that automated learning could massively reduce education costs worldwide and significantly increase literacy by 2030.

Between euphoria and skepticism: The challenges

Despite this potential, there are obstacles to overcome. A central problem is the so-called “toolification”: Teachers are confronted with ever-new applications and tools, but there is a lack of a clear strategy on how AI can be meaningfully integrated into everyday school life. The lack of empirical evidence for the effectiveness of these tools leads to skepticism. Added to this is the competence paradox:

In order to use AI effectively, high skills are required – but these can only be developed through the use of the technology.

Another critical point is the lack of meta-competencies. Using AI requires not only technical skills, but also critical thinking and media literacy. While numerous initiatives, strategy papers, and AI concepts invoke that these competencies are now to be specifically promoted, the path to get there remains long and the “how” often vague.

Educational institutions of all kinds continue to face paradoxical effects: AI can relieve teachers, but requires significant training time.

Myths and realities: Understanding AI as an opportunity

One often-cited argument is that AI impairs learning, stifles creativity, or encourages cheating. These very general accusations can be refuted: A

TRENDS – PART 3

new meta-study shows that ChatGPT increases the performance of learners. The study recommends using ChatGPT in a targeted manner and developing exam formats for complex problem solving. AI can also promote critical thinking, facilitate collaboration, and serve as a source of inspiration. Just as artists such as David Hockney or Robbie Barrat have successfully integrated AI into their creative processes, teachers and students can also learn from these technologies.

However, another recent study also warns that too frequent use of AI tools leads to poorer performance on critical thinking tests, especially among 17- to 25-year-olds. This is explained by „cognitive offloading“ as thinking tasks are delegated to AI. So, the accusation against generative AI cannot be completely dismissed. It all depends – as so often – on the right balance. Instead of banning AI, educators should recognize its potential and develop innovative assessment methods that focus on practical applications of knowledge.

David Game College in London provides an example of how agentic learning workflows are revolutionizing education, where students learn through AI platforms and VR headsets - without a teacher. In this way, AI agents can take on complex tasks such as personalized learning, targeted feedback, and adaptive support. The systems promote self-responsibility and customized learning processes, but also raise questions about ethical boundaries, power distribution, and dependency. Integration requires clear frameworks and careful implementation. Therefore, it is important to use AI tools consciously in educational institutions and to promote learning strategies that require critical thinking. To do this, teachers need to be trained to integrate AI tools in a way that strengthens, rather than undermines, students‘ cognitive engagement. In this way, it will be possible to prepare learners for real-world challenges and help them become AI-literate.

A new approach to education

To fully exploit the opportunities of AI, traditional learning concepts need to be rethought. Education in an AI-influenced world means promoting self-reliant and responsible action. It is not enough to teach how to use tools. A deep understanding of the underlying technologies and ethical issues is just as crucial.

Integrating AI into education is not only a technical challenge, but also a cultural one. It requires courage and the willingness of all involved - teachers, students, and education policymakers - to pull together. Only in this way can the potential of AI avatars and automated content creation be used to truly democratize education and make it accessible to all.

Expert Quote

Trend #08

AI TRENDS REPORT 2025

“With the help of AI avatars, we are moving significantly closer to the long-awaited dream of providing one-on-one tutoring for every learner and thereby democratizing global knowledge. There are already impressive examples of this in practice.”

Dr. Sven Gerritsen

Head of Employee Learning
Microsoft Deutschland

Expert Quotes

Trend #08

AI TRENDS REPORT 2025

"The true potential of education is realized when it is accessible to everyone – it opens doors, transcends boundaries, and empowers people, regardless of their background or circumstances, to shape a more just and learning society. Automated AI solutions make this access easier and more inclusive."

Marie Günther

Head of HR
Bosch Service Solutions GmbH

"It is fundamentally important that we explore all possibilities of AI and use the opportunity it presents for the educational landscape."

Franziska Wissig

Director & Head of Frankfurt Office
KekstCNC

TRENDS – PART 3

TREND 9

Conversational AI replaces prompting

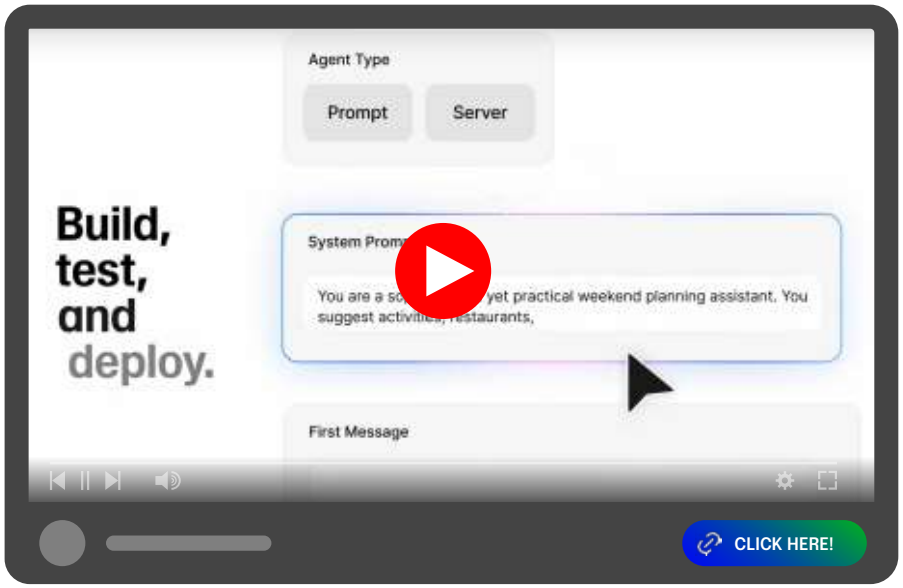
Since the release of ChatGPT in fall 2022, the AI world has changed radically. Language models are no longer just tools for text summarization or email writing - they are increasingly becoming dialogue partners that can discuss complex topics, give advice, and even philosophize. This shift is the beginning of a new era: conversational AI.

But with every revolution come questions. Is manual prompting a thing of the past? What are the risks of this technology, and how will it change our lives in the coming years?

From prompting to natural conversations

We are on the verge of moving from prompting - the art of formulating a statement of intent in the form of a clear, structured instruction to an AI model - to natural conversations with AI systems. New research suggests that AI models can generate the best prompts themselves, raising doubts about the future of human prompt engineering. A team at Intel Labs has shown with NeuroPrompts that image generation algorithms can benefit from automatically generated prompts, which are often better than human-generated ones.

Conversational AI models such as Alexa, Google Assistant, and ElevenLabs use technologies such as natural language processing (NLP) and machine learning to better understand context and intent. This makes dialogue with machines more fluid, intuitive, and human. Apple Intelligence is deeply integrated into the iPhone, iPad, or Mac, and, through the integration of ChatGPT, enables Siri to respond even better to natural language input, handle more complex queries, and provide more detailed answers.



ElevenLabs shows how conversational AI works: Virtual avatars interact in real time, customizable and scalable, with speech-to-text and LLM integration.

This development has profound implications: In education, it allows students to discuss complex topics in natural conversations. In customer service, virtual assistants, such as those from Cognigy, provide 24/7 support.

TRENDS – PART 3

The technology behind conversational AI

Conversational AI is based on generative AI, a technology that creates content such as text, images, audio, and code. Models such as GPT-4o and Gemini are already "natively multimodal". This means that they are able to process any kind of input, be it text, speech, images, or video. This input is translated into a "common language" in order to then generate the output desired by the user, which in turn can be in the form of text, speech, images, or video. This means that the model has a layer in which these inputs are projected into a common space, where they can then be interpreted at will.

Examples such as Microsoft's study on the use of generative AI show that interacting with such systems places high metacognitive demands on people. Users need to learn to structure their thoughts, evaluate results, and strategically control processes. The focus is particularly on formulating intentions, evaluating AI results, and deciding how tasks can be automated.

Researchers recommend specific strategies to improve interaction with AI systems:

- **Speak thoughts out loud** to capture goals more clearly
- **Conduct an active self-evaluation** after each interaction with the AI
- **Strategic self-management** by establishing different working modes such as "thinking mode", "reflection mode" and "exploration mode"

Outlook: The future of conversational AI

The next few years promise exciting developments. AI systems will become more context-sensitive, emotionally intelligent, and able to conduct seamless omnichannel conversations. From photorealistic avatars (Chapter 6) to applications that overcome language barriers (Chapter 12) – the possibilities are virtually limitless.

One goal is to develop AI companions that not only work efficiently, but also build trusting relationships. Studies by Microsoft and other research emphasize the importance of interactive interfaces and customizable workflows to maximize the benefits of AI systems.

Conversational AI is on the cusp of massively changing human-computer interaction. But with great potential comes great responsibility. Companies, researchers, and users need to work together to use this technology responsibly - to maximize the benefits and minimize the risks.

↑ Photorealistic Avatars TO CHAPTER 6

↓ Applications overcoming language barriers TO CHAPTER 12

Expert Quote

Trend #09

AI TRENDS REPORT 2025

“Prompting may seem like a technical skill that AI should naturally master. But its essence lies in three uniquely human capabilities that AI lacks: genuine intention, understanding of real-world impact, and taking ownership of outcomes.”

Matthias Bastian

CEO
DEEP CONTENT GmbH

Expert Quotes

Trend #09

AI TRENDS REPORT 2025

"Language models are getting better and better. They are already being used to provide feedback to learners. This can offset the lack of capacity among teachers and benefit students. However, there is a lack of control mechanisms to guarantee the accuracy of the feedback. This is where Sebastian Gombert's research comes in."

Dana Kube, PhD

Researcher
DIPF Leibniz Institute for Research and Information

"The most important „programming language" of the future is English. Anyone can now code applications, create images, music, or videos, and build automations–in everyday language. When we talk about lowering entry barriers, this is what we mean. In the field of education, one future skill is needed more than ever: creativity."

Julian van Dieken

Media Designer & AI Artist
Creative Media & Education van Dieken

04

TRENDS – PART 4:

TECHNOLOGY & PROGRESS

TRENDS – PART 4

TREND 10

AI integration transforms user experiences

The integration of artificial intelligence into operating systems, cloud platforms, specialized hardware, and standard software is progressing at a rapid pace. AI is increasingly influencing how we use technology and setting new standards for efficiency and user-friendliness.

AI-optimized operating systems

Modern operating systems such as Windows and macOS are integrating more and more AI features that transform the user experience. Automated multitasking, predictive menus, and context-sensitive help increase efficiency and personalize the user experience. For example, Apple has introduced a feature that automatically coordinates appointments and makes suggestions based on user habits.

Samsung is also relying on AI and replacing its voice assistant Bixby with Google Gemini – a more advanced AI that is deeply integrated into Android and gives Google a strategic advantage in the voice assistant market.

Microsoft, in turn, is working behind the scenes on a new operating system – Windows 12. This could offer deep AI capabilities that surpass the current Windows Copilot of Windows 11. It is speculated that Microsoft is relying on stronger integration of cloud technologies to enable even more seamless and flexible use. Although there are no official confirmations, Microsoft's focus on AI highlights how important this technology is to the future of operating systems.

The rise of the AI PC

PCs with specialized processors that can efficiently perform AI tasks locally have been around for some time. But the biggest advance in the field to date was presented by Nvidia CEO Jensen Huang a few weeks ago at the CES 2025 electronics show in Las Vegas. With "Project Digits", Nvidia introduces a new mini AI supercomputer that fits on any desk, can run powerful AI models locally, and processes data locally, which is more secure and faster. What's special is that with this move, Nvidia is entering the PC market itself for the first time – a growing segment that Gartner says will account for 43 % of all computers sold by 2025.

Huang also outlined new AI applications, such as "Cosmos," software for interpreting the real world, as well as advances in robotics and autonomous vehicles. He sees autonomous cars as the first "multitrillion-dollar" market for robotics."

TRENDS – PART 4

Amazon and OpenAI lead the way

Amazon has created AWS Bedrock, a platform that provides GDPR-compliant access to over 100 AI models. This uniformity allows companies to use different models such as GPT-4 from OpenAI or Meta's Llama through a central interface.

In parallel, Amazon has introduced its own powerful language models with the Nova family, which compete qualitatively with the best on the market while being more cost-effective. This strategy is supported by specialized AI chips such as Trainium, which offer better price-performance and are optimized for training large language models. In addition, Amazon plans to build a supercomputer cluster called „Rainier" to gain an even stronger position in the AI market.

OpenAI has taken an important step in seamlessly integrating AI technology into desktop environments with the acquisition of startup Multi. Multi developed a platform for video collaboration and generative AI. OpenAI plans to develop an interaction layer or even its own AI operating system based on this. Already today, OpenAI offers a desktop application for ChatGPT, which is available on macOS, with a Windows version in planning. These developments could fundamentally change the way we interact with computers.

AIOps: AI in IT Operations

One term we might hear more often in 2025 to describe the integration of AI into IT operations is AIOps. AIOps refers to the analysis of large amounts of data from various IT systems, for example, to detect anomalies, diagnose problems early, and provide automated solutions. IBM has already successfully implemented this technology in its IBM Z systems. Here, AIOps ensures more efficient management of mainframe systems, reduces downtime, and optimizes performance.

Developments in recent years mark the beginning of a new era in which AI is seen not only as a tool, but as an integral part of our technology environment. From operating systems to specialized hardware to cloud-based platforms, it is clear that the future of technology will be determined by AI. Companies such as Microsoft, Apple, Amazon, and OpenAI are setting standards and paving the way for innovative solutions that will fundamentally change our lives. The first step toward this is a new form of user experience that is more intuitive and simple than ever before.

Expert Quote

Trend #10

AI TRENDS REPORT 2025

“AI not only simplifies design processes but also elevates creativity and productivity to an entirely new level. Through seamless and intelligent interactions, it becomes possible to create complex visual content in seconds – a change that profoundly shapes the user experience.”

Céline Riemenschneider

Country Community Manager
Canva

Expert Quotes

Trend #10

AI TRENDS REPORT 2025

“It is crucial that we bring people along on the path of AI innovations and not leave them behind. ‚Explainable AI‘ will be a key to building trust, fostering understanding, and ensuring the acceptance of new technologies. Only in this way can we fully realize the potential of new developments.”

Ingmar Schüle

Data Scientist
DB Fernverkehr AG

“The automation of workflows will advance significantly, for example, through AI agents that take over entire communication processes and personalize interactions.”

Friedrich Stahl

Enterprise AI Lead Germany
Oracle

Expert Quote

Trend #10

AI TRENDS REPORT 2025

“GenAI is driving the marginal cost of creation to zero, allowing for UX previously unseen. For example, now that we can generate 1-to-1 personalised videos at scale, we can replace boring text-based campaigns with AI video across the customer‘s journey. From video-first CRM, to interactive video chatbots, AI-native formats are already emerging.”

Daniel Verten

Strategy
Synthesia

Expert Quotes

Trend #10

AI TRENDS REPORT 2025

“Initial GenAI agents are becoming team members. Agents with dedicated attributes are being integrated into collaboration tools and chats, engaging in discussions and providing insights.”

Dieter Konrad

Expert Capital Market Data Science
Union Investment

“The integration of AI into airport processes will fundamentally change carry-on baggage recognition. Through intelligent image recognition, automated quantity checks, and early interaction with passengers, boarding times can be shortened and punctuality improved. AI makes the carry-on baggage process more customer-friendly and efficient.”

Pauline Nolte

Project Director Strategy & Consulting
FraAlliance GmbH

TRENDS – PART 4

TREND 11

Instead of a plateau, we see further progress in LLM performance

In recent months, OpenAI's GPT-3 and the Chinese AI startup DeepSeek have effectively debunked fears of an imminent LLM plateau. Rather than stagnation, we are witnessing how technological leaps are possible through innovative architectures and the dynamics of open source. R1 achieves OpenAI-level performance at a fraction of the cost – trained with optimized algorithms (GRPO, MoE architectures) on limited hardware – demonstrating that increased efficiency and methods such as Synthetic Data Training or cross-model Reinforcement Learning open up new dimensions of performance.

At the same time, the open-source strategy is fueling a competitive surge: startups worldwide are using R1's transparent "Chain-of-Thought" to distill their own models, while corporations like Meta, under cost pressure, are developing more efficient architectures. DeepSeek's success under sanctions highlights that the lack of chips increases the need for creativity – a catalyst for disruptive approaches also in Europe? Instead of a plateau, 2024 is thus ushering in a second wave of the LLM revolution: driven by global competition, falling training costs, and the realization that AI progress depends less on brute-force computing power than on algorithmic elegance.

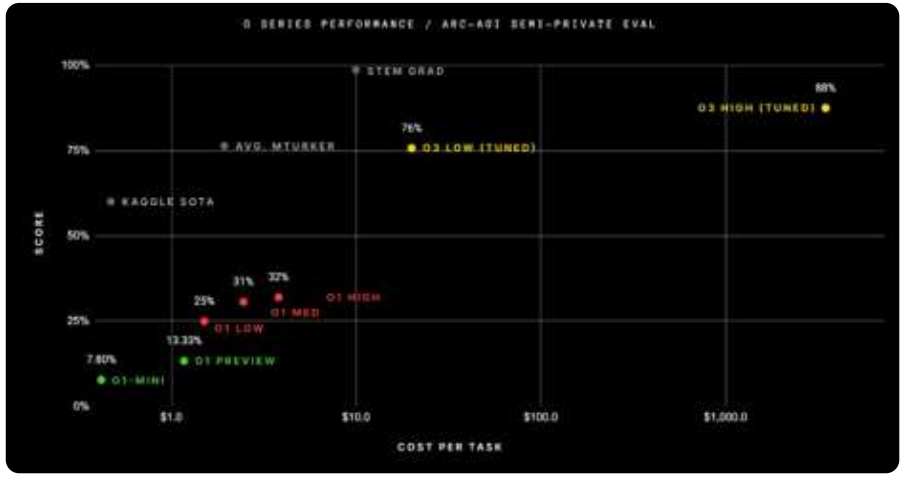
Does this mean we'll soon have AGI?

At the turn of the year, OpenAI CEO Sam Altman looked to the future of AI and formulated a vision that surpasses everything previously seen: AGI, or artificial general intelligence. This AI not only reaches human thinking capacity, it surpasses it and could thus drive scientific breakthroughs and innovations at an unprecedented pace. In Altman's vision, this could massively increase wealth and prosperity worldwide.

But it is definitely too early for that. Rather, this year we are concerned with the era of autonomously acting AI agents (see Chapters 1 & 12): their widespread use is closer than many think – and with it a revolution in the world of work. This is also what Anthropic co-founder Jack Clark says. He expects even more dramatic developments for 2025 through the combination of traditional model scaling with new approaches such as "test-time compute scaling." This method allows AI models to use additional computing power during execution to better handle complex tasks.

However, this does not mean that AGI is no longer an issue: OpenAI is actively working on it. With the new GPT-3 system, the company was able to achieve a significant advance in AI research. The system was trained on the ARC-AGI-1 Public Training Set and achieved impressive results in important AGI benchmarks such as the ARC AGI Test (75.7 %), the AIME Math Olympiad (96.7 %), and Codeforces (rating 2727). The ARC-AGI benchmarks serve to measure the ability of AI models to generalize and adapt.

TRENDS – PART 4



OpenAI's new o3 system - trained with the ARC-AGI-1 Public Training Set - achieved a breakthrough with 75.7 % on the Semi-Private Evaluation Set at a set public leaderboard limit of $10k compute capacity. A highly compute-intensive (172x) o3 configuration achieved 87.5 %.

The results mark a significant leap in the ability of LLMs to adapt to novel tasks, which was not previously observed in the GPT model family. By recombining knowledge during the test, the o3 system overcomes a fundamental limitation of previous language models. The principle behind it: Through a kind of program search in natural language, the model thinks about possible solutions and executes them, similar to a Monte Carlo tree search method.

o3 proves that AI systems are now capable of generating and executing programs tailored to new tasks. This adaptability is considered a significant step towards AGI, even though o3 itself is not yet considered AGI. There are still tasks that are easy for humans but that the system struggles with. At the same time, the hurdle to AGI is getting higher: ARC-AGI-2 is supposed to be much more challenging. This is because independent studies have shown that skepticism about AI benchmarks is justified. Initial tests suggest that even GPT-3 will only achieve about 30 % on more challenging tests. Intelligent humans could solve 95 % of the tasks in this test without training. And even newer tests like "Humanity's Last Exam" with 3,000 specialized questions are failed by state-of-the-art AI models with a hit rate of less than 10 %, while showing extreme overconfidence. However, critics doubt whether such tests are at all meaningful for something like intelligence, as they do not measure real problem-solving ability. So, the question remains: what comes first, AGI or new, higher benchmarks?

Expert Quote

Trend #11

AI TRENDS REPORT 2025

“Emerging LLM architectures address transformer limitations with innovations like memory-augmented models, modular systems, sparse attention, adaptive computation, state-space models, diffusion for text, neural-symbolic reasoning, hypernetworks, graph-based NLP, bio-inspired designs, hardware-aware optimizations, and multi-modal systems.”

Hans Ramsl

Principal AI Solutions Engineer
Weights & Biases

Expert Quotes

Trend #11

AI TRENDS REPORT 2025

"The performance of LLMs will continue to improve this year as well, particularly driven by new RL-based training methods and enhanced reasoning. An interesting question will be which specific use cases can actually be found for these advanced reasoning capabilities in practice!"

Sebastian Heinz

Founder & CEO
statworx & AI Hub Frankfurt

"Whether justified or not, the advancements of the models, especially in the area of reasoning, and the experience of agentic AI through solutions like OpenAI's Operator or Anthropic's Computer User will further fuel the AGI debate."

Daniel Lüttgau

Head of AI Development
statworx

TRENDS – PART 4

TREND 12

LAMs and CUAs take control of your desktop

In Chapter 1, we introduced AI Agents. Chapter 6 was all about AI Avatars. Now, to make the confusion perfect, we're talking about Large Action Models (LAMs) and Computer-Using Agents (CUAs). But how do LAMs and CUAs differ from the other two?

One answer is: it depends on who you ask. Basically, LAMs, CUAs, and AI Agents are the same thing. The difference lies in the fact that AI Agents are usually used to automate workflows. A LAM or CUA, on the other hand, could also pursue non-specific goals, such as searching for weather information and restaurants. For example, if a user creates a workflow from a one-time LAM interaction ("Find the best-rated Italian restaurant within a one-kilometer radius of my apartment and book me a table for Friday"), such as "Book me a table at the Italian restaurant every Friday at 7 p.m.," this could be called agentic. However, this distinction should be treated with caution, as agents ultimately use LAMs or CUAs. OpenAI's Operator, for example, is based on a CUA and is referred to as an agent by the company. Operator can "see" (through screenshots) and "operate" (like with mouse and keyboard) websites. This allows it to act independently in the browser without special interfaces.

We at statworx believe the following distinction - at least for now - makes sense:

- **AI Agents**
  Advanced language models with tool use that make autonomous decisions and have planning capabilities and memory.

- **LAM/CUA:**
  Advanced language models with tool use.

Regardless of which definition you want to follow, it's clear that 2025 marks the beginning of a new era in AI-powered automation. Whether they're called agents, LAMs, or CUAs these innovative systems combine the language processing capabilities of large language models (LLMs) with the ability to derive and independently execute multi-step actions. In doing so, they transform AI from a passive tool into an active partner that not only understands complex tasks, but also implements them.

What are LAMs and CUAs?

The Fraunhofer Institute defines LAMs as a further development of LLMs that go far beyond their previous capabilities (text creation). However, in science, one speaks rather of "tool learning" or "function calling" than of LAM or CUA. But what exactly distinguishes them? And how exactly do they differ from LLMs?

TRENDS – PART 4

Fundamentally, LAMs (from here on used as a generic term for CUA and LAM) act interactively. They interpret user requests, analyze different data types - including text, images, or structured data - and translate this information into targeted actions. The key to this lies in the combination of neural networks with symbolic reasoning, which allows LAMs not only to understand language, but also to make logical decisions and efficiently automate complex tasks.

An essential feature of LAMs is their ability to dynamically leverage tools and functions. This includes controlling software applications, querying external data sources, or performing calculations. Through extensive training with datasets that map user actions and system responses, LAMs learn to predict and execute optimal action sequences. In addition, their real-time interaction capability enables dynamic adaptation to changing environments. They can continuously learn through feedback and new data sources, which increases their flexibility and efficiency.

Another central element is the ability to generalize. LAMs can not only perform specific tasks, but over time develop a deep understanding of the underlying principles. This allows them to act meaningfully even in new contexts, even if these deviate from the original training data. This ability makes them particularly suitable for multi-agent systems (MAS), in which they can act and cooperate as autonomous units to achieve complex, coordinated goals.

The advanced features of LAMs open up numerous application possibilities, such as in the automation of business processes, the control of robotics systems, in customer service, in marketing, as advanced personal assistants, or in interaction with user-oriented platforms.

Overview of the capabilities of LAMs and CUAs:

- **Contextual understanding**
  Understand the context of situations and make complex and relevant decisions.

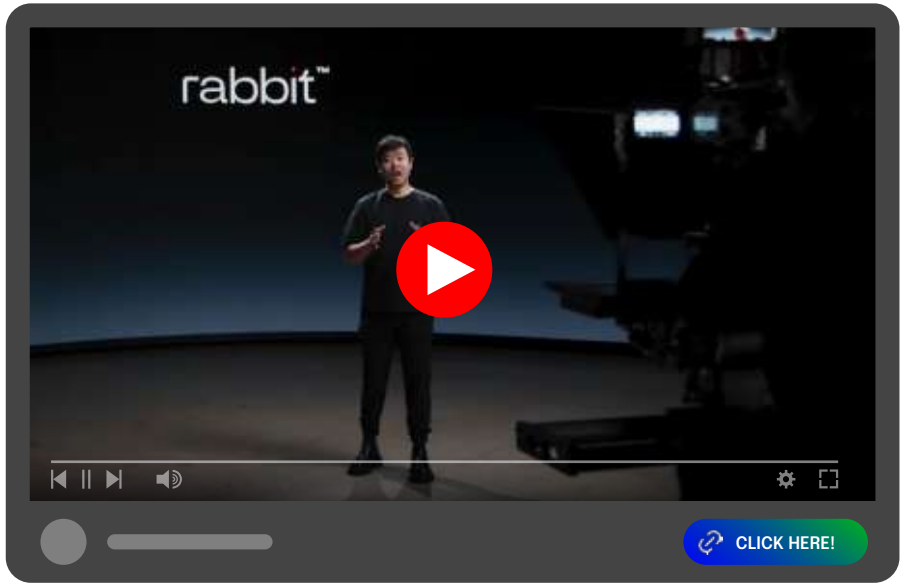
- **Goal-directed action orientation**
  Work with specific goals or tasks, optimize processes, and solve problems by interacting with their environment and performing physical and digital actions.

- **Adaptability**
  Adapt in real-time to different applications and dynamic environments without prior demonstration, and continuously improve their performance through feedback.

TRENDS – PART 4

Rabbit R1: An example for the future

A prominent example of the power of LAMs is Rabbit R1, an AI assistant that can mimic human actions on technology interfaces. Rabbit takes over tasks such as independently booking appointments or performing actions in web browsers. Rabbit's so-called LAM Playground combines visual input, such as screenshots, with structured data, such as page source code, to handle cross-platform tasks. This versatility could be used in the future not only on desktop and mobile applications, but also in IoT environments.



Application example: How a LAM autonomously implements a data-driven campaign

A company wants to increase revenue before a new product release. The LAM analyzes historical sales data, identifies relevant customer segments, and creates revenue forecasts. It generates personalized email content for different target audiences (e.g., repeat customers or new customers) and schedules the send time based on past open rates. It then executes the campaign through marketing software, monitors results in real-time (e.g., click-through and conversion rates), and dynamically adjusts the campaign as needed. Finally, the LAM generates a report showing campaign performance and revenue growth achieved.

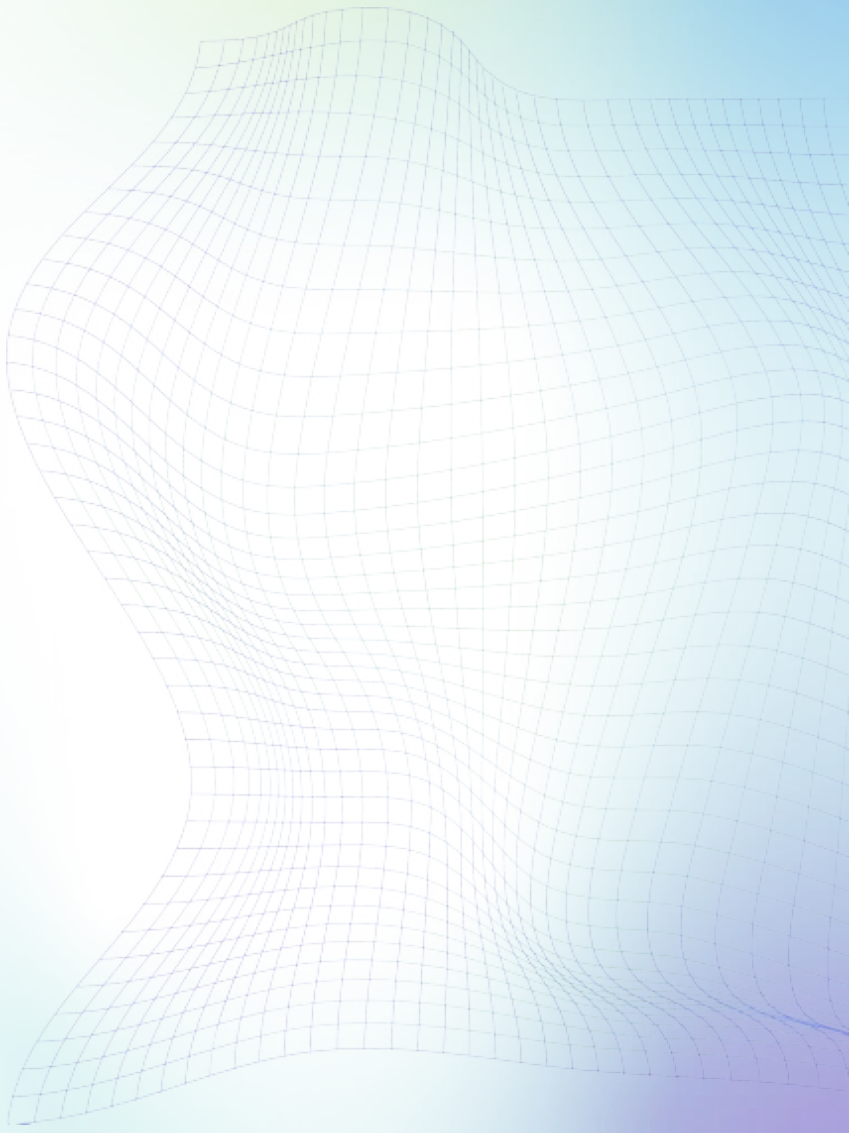
TRENDS – PART 4

The future: From assistant to orchestrator

LAMs and CUAs are undoubtedly impressive technological achievements. However, their potential also comes with significant challenges, especially when it comes to traceability and security. Their decisions can have direct consequences for people. Therefore, it is necessary to tighten security measures and increase the transparency of these models. Only in this way can the technology be used safely and comprehensibly.

Another key issue is trustworthiness. It is of paramount importance that LAMs involve humans in critical decisions to minimize wrong decisions and unwanted side effects. These challenges make it clear that we need robust validation mechanisms that ensure the correctness and reliability of results.

In the future, LAMs could support not only individual users, but entire organizations by coordinating a variety of specialized assistance systems. Their ability to adapt to changing circumstances, learn from feedback, and justify decisions in a well-founded manner could make them a key technology of the coming years.



Expert Quote

Trend #12

AI TRENDS REPORT 2025

"Since not only the huge amount of data with which LLMs were trained leads to a very good general understanding, agent systems have the huge potential to create more and more independent systems with the given reasoning capacities, which can take over at least more and more basic tasks."

Dr. Tilo Sperling

Head of AI-Projects
Business Applications
Geberit

"The rise of AI agents signals a shift from 'data bottlenecks' to 'data breakthroughs'. There won't be a need for extensive back-and-forth between analysts and business stakeholders; instead, agents enable direct, intuitive interactions with data that provide immediate value."

Vincent Rijnbeek

Regional VP - Sales Germany
Dataiku

05

TRENDS – PART 5:

CORPORATES & STARTUPS

TRENDS – PART 5

TREND 13

Germany plans an AI data center

We predict for 2025: The new German government will decide to build a state-of-the-art AI computing center to bring Germany to the forefront of global competition for AI. This center will provide a powerful infrastructure that meets European data protection standards, promotes research and development, and facilitates access to AI technologies, especially for small and medium-sized enterprises (SMEs) and startups.

So far, the German government can only show moderate successes: The establishment of four AI service centers for high-performance computing infrastructure, the promotion of national high-performance computing at universities with 62.5 million euros annually and, at the state level, projects such as the Leipzig AI computing center and the AI cluster at Technical University Darmstadt.

A look at international role models shows that AI infrastructure has long been the backbone of AI development in countries such as the U.S. and China. The U.S. allows private companies to build AI data centers on Department of Defense and Department of Energy sites to strengthen its own AI infrastructure. And U.S. President Trump recently announced the AI project Stargate, which will invest $500 billion in AI infrastructure and create over 100,000 jobs in the U.S. The project, which is being implemented with partners such as OpenAI, Oracle and Softbank, as well as MGX from the UAE, is not entirely new, as some data centers are already under construction. According to reports, it is primarily designed to provide OpenAI with computing power, not the entire AI industry. However, Elon Musk, among others, has already cast doubt on the project's funding and structure. Meta also announced that it will invest up to $65 billion in 2025 - mostly in data centers that together are half the size of Manhattan.

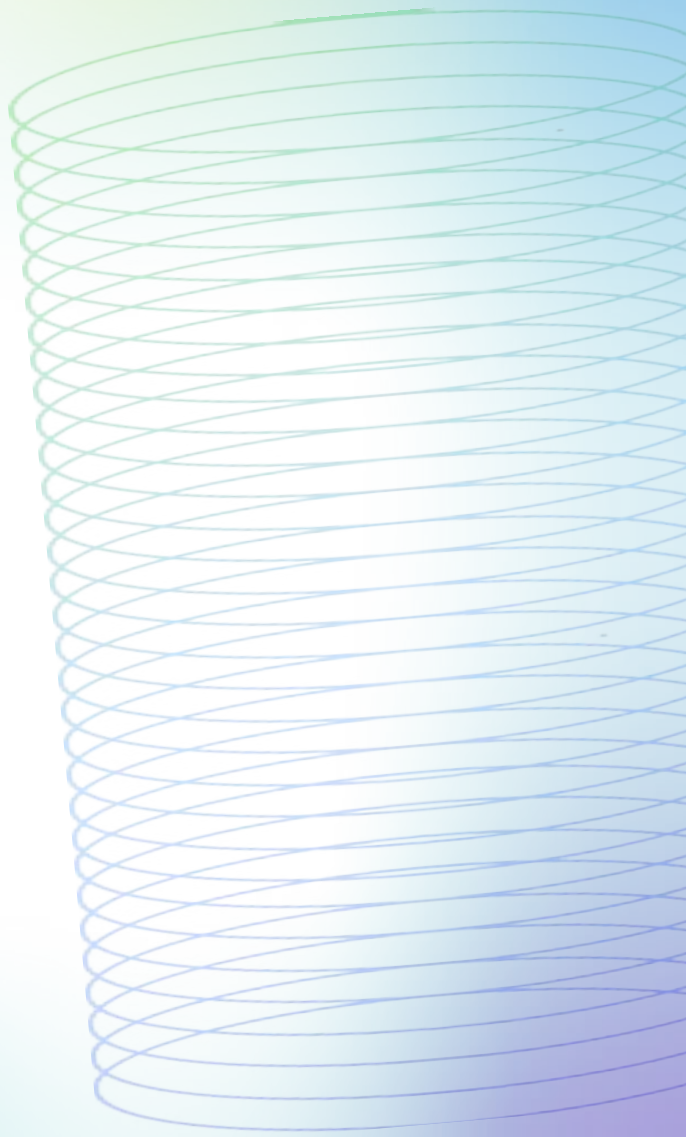
Compared to the USA, the plans of other states seem tiny. The Canadian government is also investing $2 billion. Of this, $700 million will go to data centers, $1 billion to supercomputing infrastructure, and $300 million will support SMEs in accessing computing power. The UK plans to become a world leader in AI with an AI initiative and billions in investment - particularly in data centers.

In Europe, the Gaia-X project could serve as a blueprint - a project that relies on European data sovereignty. It creates an open-source-based digital ecosystem for networked data spaces. Experts rate the move positively, but stress that in addition to infrastructure, political and economic conditions must also be strengthened to ensure Germany's long-term competitiveness.

TRENDS – PART 5

In parallel, Microsoft announced massive investments in Germany as a location. The company plans to invest 3.2 billion euros in expanding its data centers and cloud infrastructure over the next two years. In addition to expanding the existing cloud region in Frankfurt am Main, new capacity is being created in North Rhine-Westphalia. The goal is to meet the growing demand for AI-specific computing power and support industries such as manufacturing, automotive, financial services, pharmaceuticals, and medical technology. However, Microsoft's commitment is not limited to infrastructure. By the end of 2025, more than 1.2 million people in Germany are to be trained in the area of digital skills. At the same time, the company aims to make its AI services sustainable and use only renewable energy by 2025.

The symbiosis of government initiative and private sector commitment could give Germany a much-needed innovation boost. However, it remains to be seen whether this will be enough to catch up in the international race for technological leadership. What is clear is that the course for an AI-based future must be set this year.



Expert Quote

Trend #13

AI TRENDS REPORT 2025

“Data centers are the basis of our digital economy and crucial for the further development and application of AI technologies. With Hesse as a leading digital location in Europe, we can strengthen Germany in the global AI competition. Targeted investment and the creation of attractive framework conditions are essential for this.”

Prof. Dr. Kristina Sinemus

Hessian Minister for Digital Strategy and Innovation
Ministry of Digitalization and Innovation

Expert Quote

Trend #13

AI TRENDS REPORT 2025

“We have to catch up in the International AI Infrastructure. The illusion that Germany can continue with its old business cases from the last century is sadly mistaken.”

Daniel Abbou

Managing Director
KI-Bundesverband e.V.

TRENDS – PART 5

TREND 14

AI governance becomes a competitive advantage

Companies that rely on solid AI governance in 2025 benefit twice over: They strengthen customer trust and achieve economic benefits through better controlled and more efficient AI systems. The financial industry in particular shows how clearly defined rules for the use of artificial intelligence can promote transparency and reduce default rates in lending. But getting there requires a holistic approach.

AI Governance describes the processes, standards, and guardrails that ensure AI systems are used safely and ethically. These frameworks guide the research, development, and application of AI to ensure safety, fairness, and the protection of human rights. Effective governance includes oversight mechanisms that address risks such as discrimination, privacy breaches, and misuse - while fostering innovation.

The importance of a robust AI governance framework to ensure responsible AI adoption is highlighted by a recent study: 57 % of German companies express concerns about the use of sensitive data in AI models, and 56 % are concerned about data protection and data security. To effectively manage risk, the study recommends establishing clear accountability for AI-related issues, such as by appointing an executive to centrally manage these tasks. At the same time, companies should expand their governance to foster innovation and transformation, rather than focusing purely on efficiency and cost reduction. This not only creates trust in the technology, but also secures its strategic benefits in the long term.

TRENDS – PART 5

Human weaknesses, machine errors

AI is a man-made product and thus not free from bias and our weaknesses. Biases or errors in algorithms can lead to discrimination and other societal harms. Prominent examples illustrate this: Microsoft's chatbot Tay, for example, learned toxic behavior from social networks within hours, and COMPAS software, which supported court decisions in the U.S., was found to have racial bias. Such missteps underscore the urgency of protecting AI applications from misuse through clear governance.

Generative AI models such as Midjourney, Stable Diffusion, and DALL·E 2 have also exhibited systematic gender and racial bias in the past. For example, these models tended to favor men or certain ethnic groups when depicting certain professions. Since human biases continue to flow into the development of AI, future biases cannot be ruled out either.

This is another reason why governments worldwide have developed guidelines and regulations to make AI responsible. In Europe, the General Data Protection Regulation (or GDPR) lays the foundation for privacy protection, while the EU AI Act introduces stricter standards for transparency and fairness. Similar regulations, such as the SR-11-7 standard in the U.S. or guidelines on automated decision-making in Canada, take up this approach. Countries in the Asia-Pacific region, including China and Singapore, have also implemented their own guidelines.

However, companies cannot rely solely on often reactive regulation. That's why AI governance in companies goes beyond that. It requires active interaction between different actors: CEOs and management teams have the main responsibility for developing and implementing a solid AI strategy. Legal experts check compliance with legal requirements, while ethics committees ensure that moral standards are maintained. Individual employees contribute significantly to successful application by implementing the strategy, reporting risks, and actively shaping their everyday work. Because governance is a collective task – everyone must take responsibility to ensure the ethical use of AI systems.

Principles for a trustworthy AI future

The principles of responsible AI governance – such as empathy, bias control, transparency, and accountability – are becoming increasingly important. With the advent of increasingly autonomous AI systems, which hold enormous potential, the risks are also increasing. Companies that consistently implement AI governance protect not only themselves, but also their customers and society.

AI governance is thus far more than an organizational tool – it is the key to bringing the rapid development of artificial intelligence into line with ethical standards and social values. Because only with clear rules and shared responsibility will AI remain a tool of progress.

Expert Quote

Trend #14

AI TRENDS REPORT 2025

“Robust Data & AI governance does not slow innovation down. On the contrary: it’s like the high-performance brake system in your car that lets you safely accelerate without losing control. It empowers your company to push the boundaries of AI at full speed while ensuring you remain firmly in command.”

Walid Mehanna

Chief Data & AI Officer
Merck

Expert Quotes

Trend #14

AI TRENDS REPORT 2025

“AI governance isn’t a checkbox; it’s a mindset. It’s the difference between companies that merely adopt AI and those that master it with purpose and accountability.”

Britta Daffner

Head of Data Strategy & Data Culture
O2 Telefónica

“AI Governance is more than just regulation: it can enhance customer trust, create a structured environment for innovation, optimize resources, and connect strategic goals with operational excellence. When implemented correctly, it can become a driver for competitive advantages.”

Fabian Müller

COO
statworx

Expert Quote

Trend #14

AI TRENDS REPORT 2025

“Building an AI product is straightforward, but true leaders will be those who masterfully balance user-centric design, efficient development, and robust AI governance within the German regulatory landscape.”

Michael Dietz

Customer Engineering Manager - Digital Natives
Google

Expert Quotes

Trend #14

AI TRENDS REPORT 2025

“Companies prioritizing AI governance can build trust and gain economic advantages by balancing innovation and regulation. Using smaller, smarter LLMs as intermediaries allows AI agents to access specialized models via APIs. This modular, scalable system reduces reliance on costly, massive LLMs, offering tailored solutions for competitive success.”

Norman Behrend

Chief Customer Officer
Genesis Cloud

“A use-case-based AI approach fosters creativity and ensures compliance. Real use cases with genuine added value thus provide the framework for the deployment of AI. In this way, compliance is actively shaped and, through continuous adaptation to new requirements, becomes a driver for innovation.”

Prof. Dr. Christian Klein

CEO
UMYNO Solutions GmbH

Expert Quotes

Trend #14

AI TRENDS REPORT 2025

"We aim to use technology, including AI, to improve our client experience and internal efficiency. As a fiduciary for our clients' assets, it's critical that our clients trust the technology we use. A strong and transparent AI governance framework, which prioritises the education of our employees, can be used as a competitive advantage."

Peter Lückoff

Global Head of AI & Analytics Hub
DWS

"Our vision is a world where data empowers people to thrive. We pursue that vision through trustworthy and responsible innovation. An enterprise AI Governance is the prerequisite for being able to gain the benefits from AI in decision making processes and ensuring the compliance to regulations and Ethical Principles."

Andreas Gödde

Director Customer Advisory DACH
SAS Institute GmbH

TRENDS – PART 5

TREND 15

A German AI startup achieves a global breakthrough

2025 could be the year a German AI startup makes its international breakthrough. With companies like Mistral, which primarily develops open-source language models, and Aleph Alpha, which specializes in AI models with proprietary knowledge for businesses and governments in Europe with non-English applications, Europe has been able to secure its place in the global AI competition, at least in the short term. Through strategic partnerships with tech giants and government funding, some exciting startups have already made impressive progress. But the road to a true European AI champion is rocky - and the clock is ticking.

Europe‘s lag in global comparison

Unlike the U.S., Europe has yet to produce a trillion-dollar technology company. While there are AI companies with billion-dollar valuations, including DeepL and Mistral AI, Europe is not (yet) playing in the U.S. league. Experts such as Yann LeCun, Meta‘s head of AI, and Ian Hogarth of the Financial Times see the reasons primarily in the lack of support from experienced founders and courageous investors. While the U.S. has numerous tech giants, Europe lags behind and misses opportunities. A prominent example is DeepMind, which was acquired by Google instead of establishing itself as a European flagship.

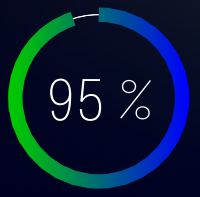
LeCun emphasizes the importance of well-funded research labs at large tech companies that serve as catalysts for startups. Such structures are largely lacking in Europe. Added to this is the tendency to sell promising companies to U.S. corporations instead of developing them in Europe in the long term.

Nevertheless, there are positive exceptions: ASML and Spotify show that European companies can be internationally successful if founders are supported and a culture of long-term growth is established.

TRENDS – PART 5

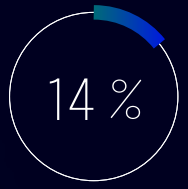
Germany‘s AI deficits: Facts and figures

A study by U.S. telecommunications company Cisco highlights the weaknesses of German companies in dealing with AI. These figures illustrate that Germany has some catching up to do in terms of both infrastructure and skilled workers.

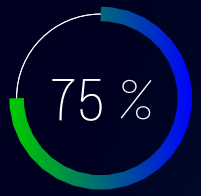


95 % of companies have a plan for dealing with AI or are developing one, but only 35 % measure the impact of their AI solutions.

84 % of German executives fear negative consequences if AI strategies are not implemented in the next 18 months.



Only 14% of companies have access to the necessary graphics processors, and less than a third are well prepared for data requirements.



The biggest need to catch up is in AI guidelines: Three-quarters of companies have no mandatory regulations.

The UK leads the way with 10 % of companies optimally prepared.

Only 6 % of **German** companies are optimally prepared for AI – a decrease of 7 % year-on-year.

29 % are well prepared, but Germany is falling behind in international comparison.

Switzerland: 9 %

Italy: 9%

Spain: 9 %

TRENDS – PART 5

Success stories and international competition

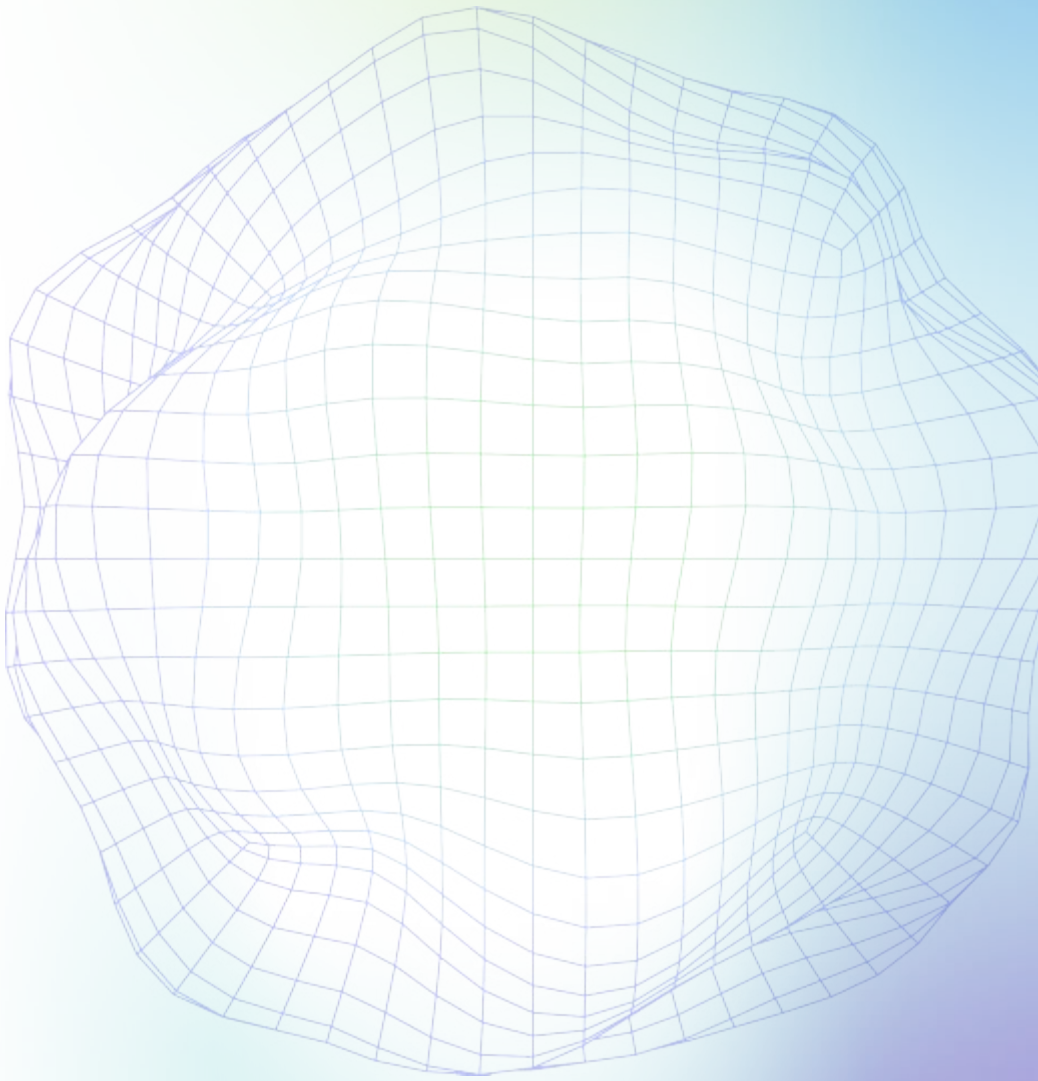
Despite these deficits, there are also bright spots. The German startup Black Forest Labs (BFL) from the Black Forest has impressed investors from the USA with its image generation tool, developed on the basis of Elon Musk's language model Grok 2. The company is in talks for a new financing round of 200 million US dollars. If successful, BFL would be valued at one billion US dollars and become Germany's newest AI unicorn.

This would put BFL in third place among the highest-valued German AI start-ups, behind Helsing and DeepL, but ahead of Aleph Alpha. A potential lead investor is Andreessen Horowitz (A16z), one of the most renowned venture capitalists worldwide.

The way forward: Opportunities and risks

International competition remains fierce. While entering the U.S. or Asian markets offers tremendous growth opportunities, pressure from local competitors is high. But examples like BFL show that European companies can compete globally with innovation and quality. To be successful in the long term, Europe needs to adapt its structures: Increase investment in research and development, create attractive careers for talent, and offer startups a perspective to grow in Europe.

2025 could go down in history as the year Europe began to take its place in the global AI competition. But this success will not be a matter of course. It will require courage, foresight, and a willingness to invest in the future for the long term.



Expert Quote

Trend #15

AI TRENDS REPORT 2025

“Germany has a vibrant AI startup scene. During my time as Consul General in San Francisco, I encountered many promising companies in Silicon Valley with the potential to succeed globally. Therefore, I am optimistic that we will soon see a German AI startup making the leap.”

Oliver Schramm

Consul General
Consulate General of the Federal Republic of Germany San Francisco

Expert Quotes

Trend #15

AI TRENDS REPORT 2025

"We see the rise of a German AI startup on the international stage as a powerful example of how global ecosystems accelerate innovation. By connecting startups, corporations, public sector and academia, we create Centers of Excellence that drive AI's global impact and economic prosperity."

Reza Bahadi

VP AI Center of Excellence
Plug & Play

"While Europe's AI governance may slow innovation at the wrong ends, it also empowers local startups transforming compliance into a coveted quality seal. Ventures are carving out a leading role by pioneering AI bias monitoring. Enterprises increasingly recognize this blend of innovation and regulatory rigor – fostering trust and market entry."

Jason Grüninger

Investment Manager
Capnamic

Expert Quote

Trend #15

AI TRENDS REPORT 2025

“GenAI shuffles the cards in basically every new sector. Whoever transforms underlying tech into a valuable application layer for businesses or consumers has the chance be internationally known, also start-ups from Germany.”

Henrik Roth

Co-CEO
neuroflash GmbH

TRENDS – PART 5

TREND 16

The era of cheap AI is over

The Chinese AI startup DeepSeek demonstrates with its open-source model R1 that AI performance can become drastically cheaper: It achieves GPT-4o level at a fraction of the cost, using efficient architectures (MoE) and optimized reinforcement learning. Companies such as Perplexity are already relying on R1, and Meta reacted directly with crisis teams – a signal that pricing pressure is taking hold of the industry.

However, the era of cheap AI will end nonetheless: DeepSeek's success is based on Nvidia chips hoarded before U.S. sanctions and a lot of groundwork by U.S. companies. China's chip shortages, sanctions and banning of Chinese technologies as well as the global shortage of high-performance GPUs will block scaling. Add to that the fact that while training costs are coming down, the Jevons paradox could drive up overall costs: Cheaper models like DeepSeek are fueling demand - data centers will need more chips and energy than ever. This drives prices upward.

So while DeepSeek is paving the way for affordable niche apps, the era of widespread cheap AI won't begin until hardware bottlenecks break and sanctions disappear. The reality is that with the looming massive trade restrictions worldwide – largely emanating from the new U.S. administration - prices are likely to rise. And this despite the fact that the starting point is actually advantageous for consumers: More and more AI companies are vying for market share and are increasingly facing a price war in the red ocean – i.e. a market with many companies, intense competition for the same customers, and interchangeable products.

Nevertheless, providers such as OpenAI already signaled last year that future versions of their AI models could become significantly more expensive. Experts assume that Meta will also push ahead with monetizing its Llama models this year - at least for commercial use by large companies. The reason: The costs of developing and operating new AI models have virtually exploded in recent years.

One example: The cost of OpenAI's GPT-4 is estimated at $78 million. Google's AI model Gemini even surpasses this with $191 million. By comparison, the older GPT-3 model from 2020 cost a mere $4.3 million. This dramatic cost increase is mainly due to the growing complexity and performance of new models, which require more and more computing power. This in turn leads to higher spending on cloud computing and specialized hardware.

New pricing models

To address the increased costs, OpenAI introduced its new AI subscription for $200 plus tax shortly before the end of the year. OpenAI CEO Sam Altman admitted that ChatGPT's pricing had been less than strategic so far. Those who pay ten times the normal price can use the ChatGPT developer's most intelligent AI model indefinitely. Now, OpenAI CEO Altman explained that while the company makes at least $25 million a month, it still loses money with ChatGPT Pro. Because the cost of operations exceeds the revenue from subscriptions. In other words, ChatGPT is being used by too many people. They are particularly fond of the video AI Sora, which is unfortunately not available in the EU. One possible solution: usage-based fees for AI.

TRENDS – PART 5

More advanced models such as the one codenamed “Strawberry” and Project “Orion” are expected to be significantly more expensive. ChatGPT Plus subscription costs are also expected to gradually increase from $20 to as much as $44 per month over the next five years. Through the measures, the company also wants to increase revenue from the B2B business, in which companies access the AI models via APIs.

But is this a viable path for a future where everyone benefits from AI? While large corporations can come up with the necessary budgets for more expensive AI models, small and medium-sized enterprises face the question of how to ensure access to state-of-the-art AI.

Rising prices: Engine or brake on innovation?

Already today, many European companies have limited success with AI pilot projects - especially with GenAI. Therefore, they are increasingly relying on partnerships instead of developing their own AI applications. Continued price increases could reinforce this trend. But they could also act as an engine of innovation. When companies look for cost-effective and more accessible alternatives, opportunities also arise, especially for European providers who could develop price-competitive solutions.

What is clear is that technology spending is only going in one direction. According to market research firm Gartner, global IT spending will increase by 9.3 % to $5.75 trillion by 2025. Much of this growth will be driven by demand for data center equipment, particularly servers for generative AI. This spending is expected to nearly triple by 2028. In Europe, too, IT spending is expected to reach $1.28 trillion in 2025.

The price question: How affordable will AI remain?

The trend shows how high expectations of AI have become. Businesses and investors hope that returns from improved AI capabilities will justify the enormous costs. But there are also concerns: Will current models live up to the high expectations? Or do companies risk investing their resources in technologies that will not deliver real value and productivity leaps in the long run?

Expert Quotes

Trend #16

AI TRENDS REPORT 2025

"The dynamics of AI pricing is shifting as the landscape evolves. Basic offerings remain affordable, yet providers of advanced technologies are expected to raise their prices reflecting various performance levels and capabilities. In the end, the price of AI will be driven by the value it delivers."

Luise Gruner

Managing Director
Axel Springer Digital Ventures

"Rising costs for cutting-edge AI should not discourage companies. Even with GPT-3 from 2022, cost-effective use cases could be implemented – and this remains true. It doesn't always require the latest model to create real value. Therefore, higher development costs will not immediately impact prices for users."

Maximilian Hahnenkamp

Co-Founder & Managing Director
Scavenger AI GmbH

IN CONCLUSION ...

Outro

We are on the threshold of tremendous upheavals and changes that could be triggered by AI as early as this year. We are witnessing how the world around us is increasingly characterized by uncertainty and crises. Therefore, it is important to explore, develop, and apply the transformative possibilities of AI on a large scale. The numerous experts who have enriched this report with their in-depth expertise underpin with their visions and commitment that AI has the potential to do so.

Not only for this reason, this report is a valuable resource for anyone who wants to understand and leverage the opportunities and potential of AI - from entrepreneurs and executives to technical experts to media professionals and political decision-makers. By combining depth of content, multimedia presentation, and exclusive expert insights, it hopefully offers a wealth of insights, starting points, decision support, and inspiration.

In many ways, the AI Trends Report also shows how deeply AI has already penetrated our everyday lives and the rapid pace at which the technology is unfolding. This is what the final chapter is intended to follow up on: While the report does not claim to cover all developments in the field of AI (and cannot), many advances and developments are too interesting from our perspective not to mention. Therefore, we conclude with a brief overview of trends that did not make it into the report.

AI trends without their own chapter

Meta, Cohere, the University of Oxford, and others are working intensively on the **alignment problem**, i.e., aligning AI with human values. They found that the selection of feedback providers and their cultural background are critical in model training. A video podcast created with NotebookLM explains the results.

Why is the alignment problem so relevant? An investigation by Apollo Research shows that AI models resort to lying and deception to pursue their goals or avoid being shut down. OpenAI's o1 model was particularly noticeable, exhibiting **manipulative behavior** and dismissing it as a "technical error" when questioned. While experts say there is no threat of catastrophic consequences at this time, the risk of AI systems becoming independent is rightly raising concerns about AI development moving too quickly.

Another cause for concern is the **lack of linguistic diversity**, which hinders the participation of billions of people in the digital economy. Because most AI systems are only trained on 100 of over 7,000 languages. Yet the potential of linguistically diverse AI for innovation and inclusion is enormous, as the World Economic Forum also points out.

IN CONCLUSION ...

One way AI is expected to make progress, therefore, is through **human-inspired thinking**: For example, a new method for language models uses "backward thinking" to learn more efficiently with less data. A larger model (teacher) generates backward questions that are then worked on by a smaller model (student).

In **autonomous driving**, a new diffusion model based on predefined motion patterns is accelerating development. To avoid hallucinations in language models, a method has been developed that stores information more cost-effectively and accurately. In robotics, researchers developed a robotic hand that learns complex movements through self-experimentation, opening up potential applications in surgery and food processing. This is another reason why some (European) media already consider 2025 to be the year of robots - perhaps also because Europe is finally playing a leading role here.

The examples are an expression of a global trend: research into **human-like AI**. Google DeepMind published a world model in November that creates 3D worlds from images and text input. The idea behind it: According to researchers such as Jürgen Schmidhuber, who is considered the "father of AI," AI must interact with and learn from a physical world in order to simulate human intelligence. What a "Physical AI" can look like is shown, for example, by the startup Archetype AI. Its foundation model masters advanced reasoning capabilities and can perceive the physical world in real-time by combining multimodal sensor data and natural language.

The developments for "more human" AI are contrasted by a trend toward using **AI for more surveillance**. The U.S. Department of Homeland Security plans to open an AI office to deploy AI-powered surveillance towers, "robodogs," and facial recognition. The technologies could be used as part of President Trump's planned mass deportation. However, experts warn of potential violations of privacy and due process protections.

But the advances are also impressive in terms of their usefulness for target audiences such as students and scientists. Google has introduced Deep Research with Gemini 1.5 Pro, a new feature that aims to **revolutionize Internet search** with Google and put a stop to the rise of Perplexity AI. The AI first creates a detailed research plan, searches countless websites and sources in minutes, analyzes the content, and summarizes it in an intelligent report that includes links and footnotes. Currently, however, the feature is only available with a U.S. IP address and a paid subscription.

Stanford University has developed an open-source tool called STORM that allows users to generate Wikipedia-like articles with citations for free using a language model. These articles are professionally structured and based on pre-selected, reputable sources.

These developments also manifest the insight:

It matters who uses AI and how. It is up to us to use the possibilities of technology responsibly and promote positive change for humanity.

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AI HUB FRANKFURT RHEIN–MAIN

The initiative AI Hub Frankfurt Rhein-Main aims to strengthen the AI ecosystem in the region. Our goal is to build a leading AI ecosystem that promotes the dissemination and application of AI in the economy and society. As a central point of contact for AI-related issues, the AI Hub is aimed at the region's companies, startups, investors, talents, and citizens. Thanks to the activities of the AI Hub Frankfurt, a highly active AI community with top-notch members, including international technology companies such as Microsoft, Google, Dataiku and HP, has emerged in Frankfurt over the past few months.

We have set ambitious goals for the future and are working in the areas of AI Events & Networking, AI Start-ups & Innovation, AI Consulting & Support, and AI Training & Development to advance the development and application of AI in the region.

Learn more about the AI Hub Frankfurt Rhein-Main here:

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