PEAK ACE®

The State of AI

Is it just art, or can it do more?

Intro - Everyone's talking about AI

Ever since the emergence of ChatGPT, artificial intelligence has made its mark on society

Artificial Intelligence - AI for short.

These are the two letters that are keeping the world on its toes. Since ChatGPT, this has been truer than ever; it **generated 1 million registrations within 5 days**. ChatGPT presents AI in a way that seems to make it more suitable for society. This is also shown by the development on Google Trends. Since November 2022, queries for AI buzzwords have been increasing steeply.

But what does that actually mean?
Besides GPT, what is actually relevant when it comes to AI?
What about finances, opportunities, and risks? In this whitepaper, we answer these questions.
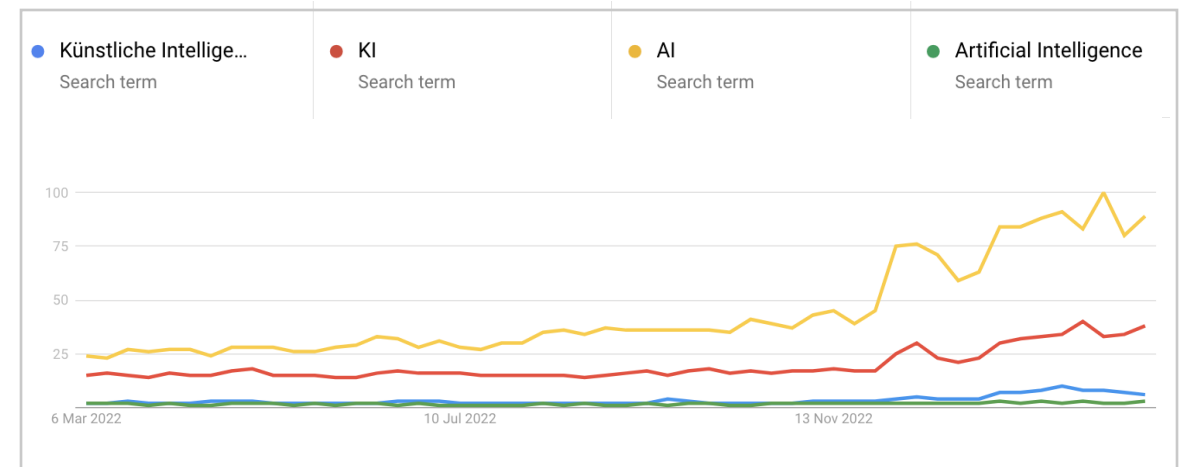
Source: Google Trends, 02.03.2023

" *In recent years, the topic of AI has become increasingly important. It is the defining topic in digital marketing 2023 - and it will be in the future too. With new processes and automations, we can now achieve high efficiency and productivity gains within a very short time. AI offers many opportunities, but it should also be treated with caution.*

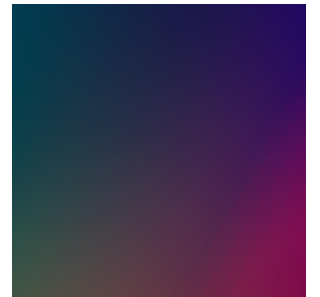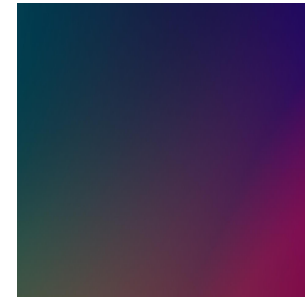**Bastian Grimm, CEO at Peak Ace**

Agenda

Artificial... what?
Defining "AI"

Artificial... what?
Defining "AI"

According to Duden, intelligence is the "**ability** [of people] to think abstractly and rationally and to derive purposeful action from this. But what about artificially created intelligence?

Artificial intelligence is more than just a USB stick. Rather, according to the European Parliament, it encompasses **a machine's ability** to mimic human abilities. These abilities include logical thinking, learning, planning and creativity.

Even a simple algorithm counts as a "small AI."

AI systems can adapt. They learn from previous situations by **analysing the consequences of their actions**.
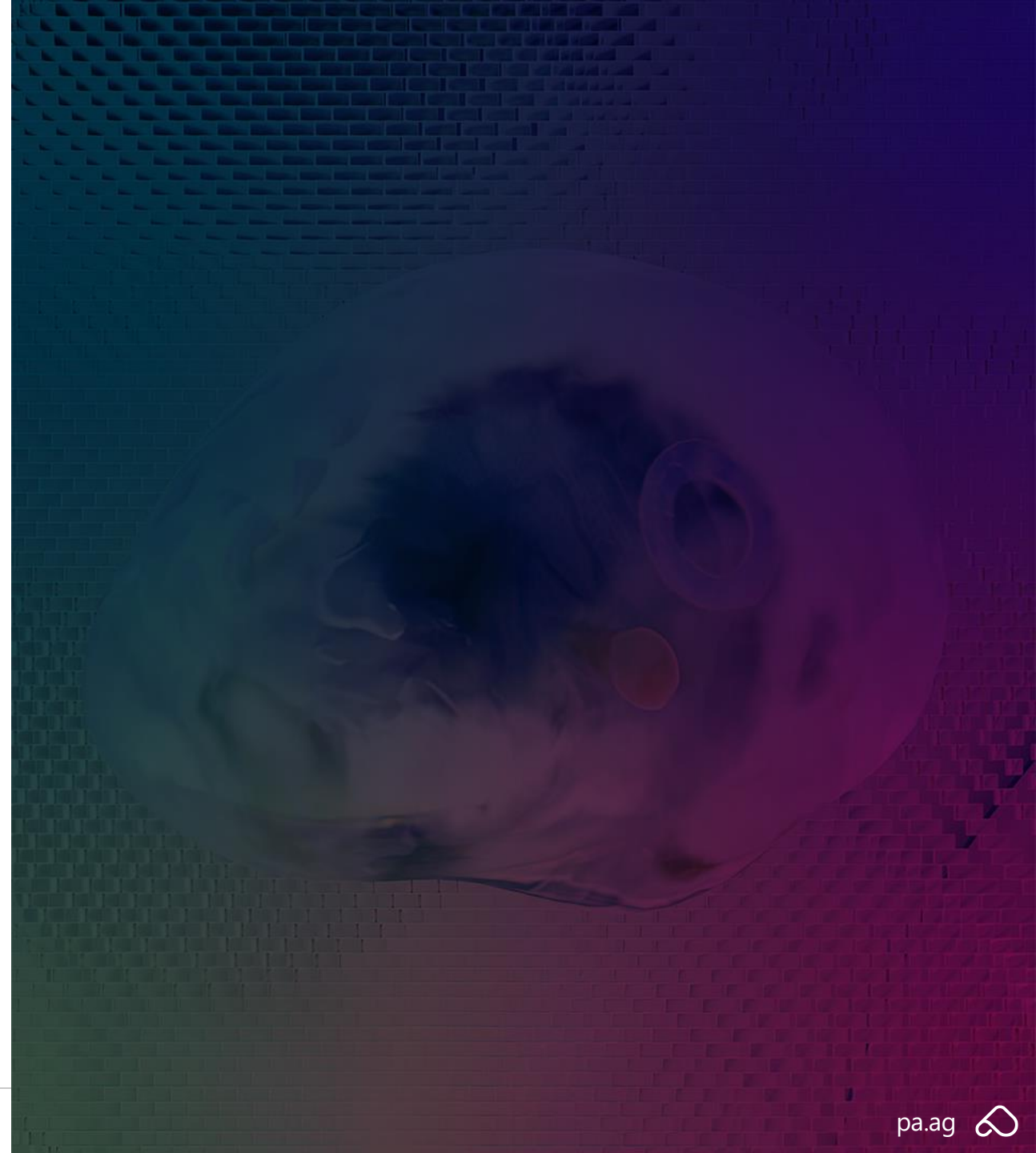
Three important attributes of artificial intelligence

Data, data, data... and even more data

1
AI evaluates large volume statistical data, makes decisions based on it, learns from it and recognises patterns.

2
The ability of a machine to learn independently and to solve complex tasks.

3
AI systems can react to their environment and work with specific sensors to do so.

What is what: an explanation of AI terminology

An interplay of multiple applications enables what we call AI.

- **Machine Learning:** an AI application that automatically learns and improves from past experience without requiring programming.

- **Deep Learning:** a subfield of machine learning that learns by processing data using artificial neural networks.

- **Neural Network:** computer systems that mimic the neural connections in the human brain and enable deep learning.

- **Cognitive Computing:** seeks to mimic and enhance human-machine interaction by understanding human language and the meaning of images.

- **Natural Language Processing (NLP):** a tool that allows computers to understand, recognise, interpret and produce human speech.

- **Computer Vision:** uses deep learning and pattern recognition to interpret image content.

KEY COMPONENTS OF AI

Machine Learning · Deep Learning · Cognitive Computing · AI · Neural Network · Computer Vision · Natural Language Processing (NLP)
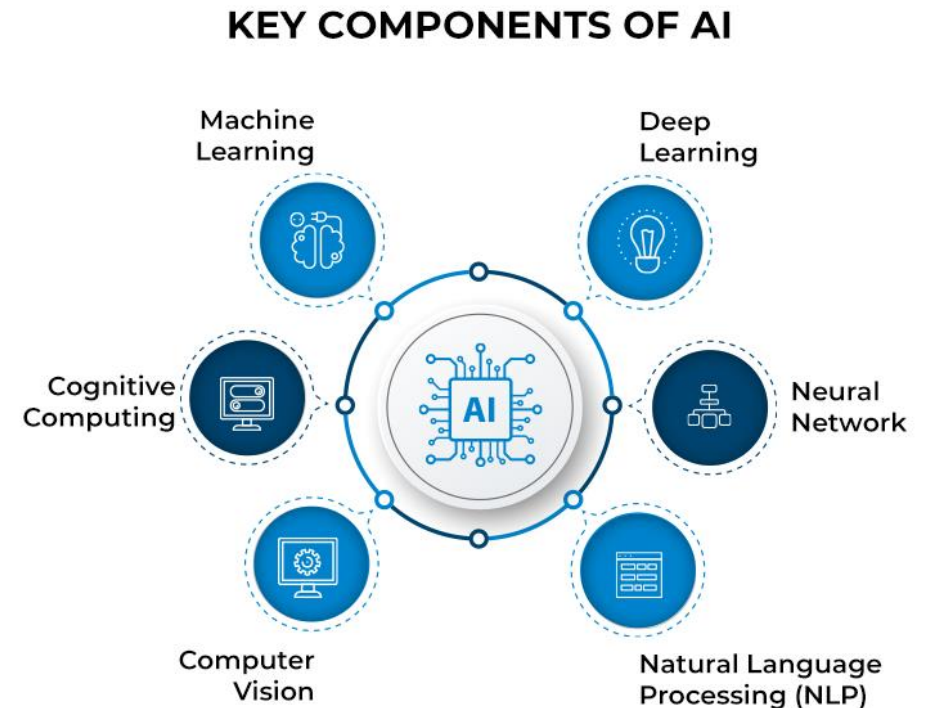
Alexa, where do we already use AI?

> " *I found a section in a whitepaper from Peak Ace for you. It tells you how Artificial Intelligence is already being used."*

Alexa, digital voice assistant

A ghost in web 2.0
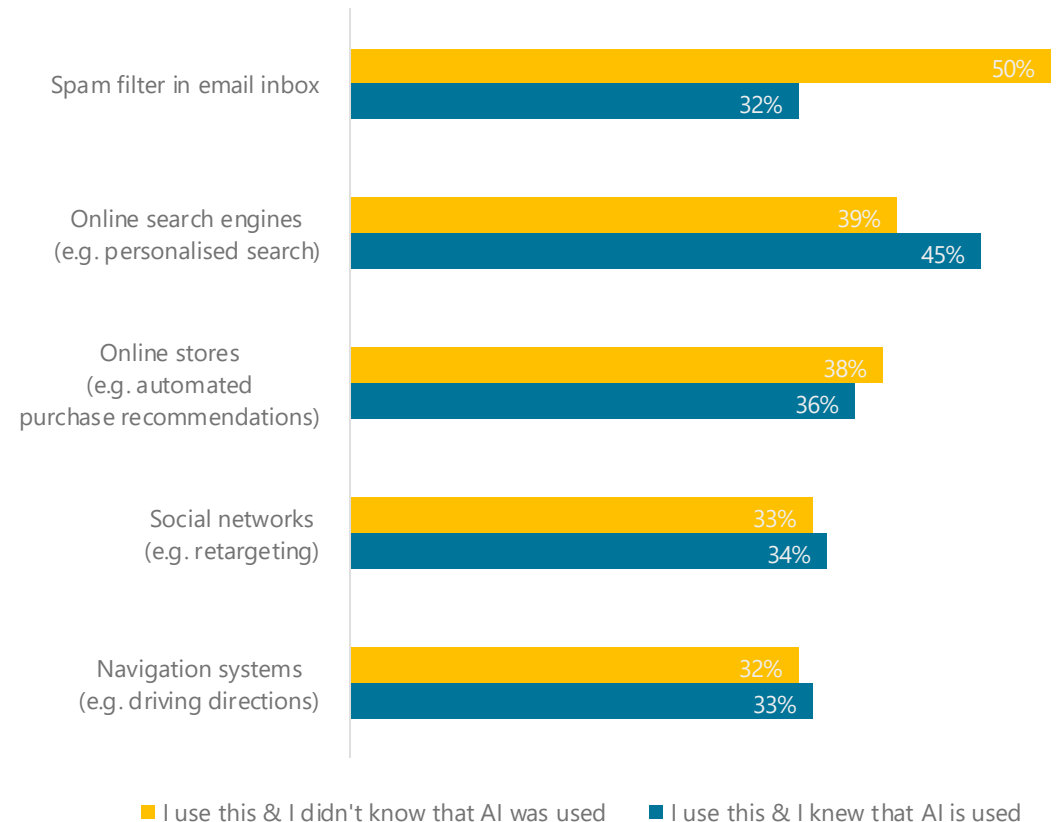
The knowledge about AI in online applications

AI has long been part of our everyday lives. We use it so naturally to the point that we no longer even notice that it's AI (of a kind).

The TÜV Association launched a survey on this in 2021. Of the 1,000 participants, **40% did not know that online search engines are a type of AI**, even though they used these applications.

Similarly, regarding customised advertising on social networks: **just under half of the participants did not know that AI was involved.**

Source: TÜV Association. Study: Künstliche Intelligenz. 2021

A Ghost in the Web 2.0 - The Knowledge of AI in Online Applications

Application	I use this & I didn't know that AI was used	I use this & I knew that AI is used
Spam filter in email inbox	50%	32%
Online search engines (e.g. personalised search)	39%	45%
Online stores (e.g. automated purchase recommendations)	38%	36%
Social networks (e.g. retargeting)	33%	34%
Navigation systems (e.g. driving directions)	32%	33%

■ I use this & I didn't know that AI was used   ■ I use this & I knew that AI is used

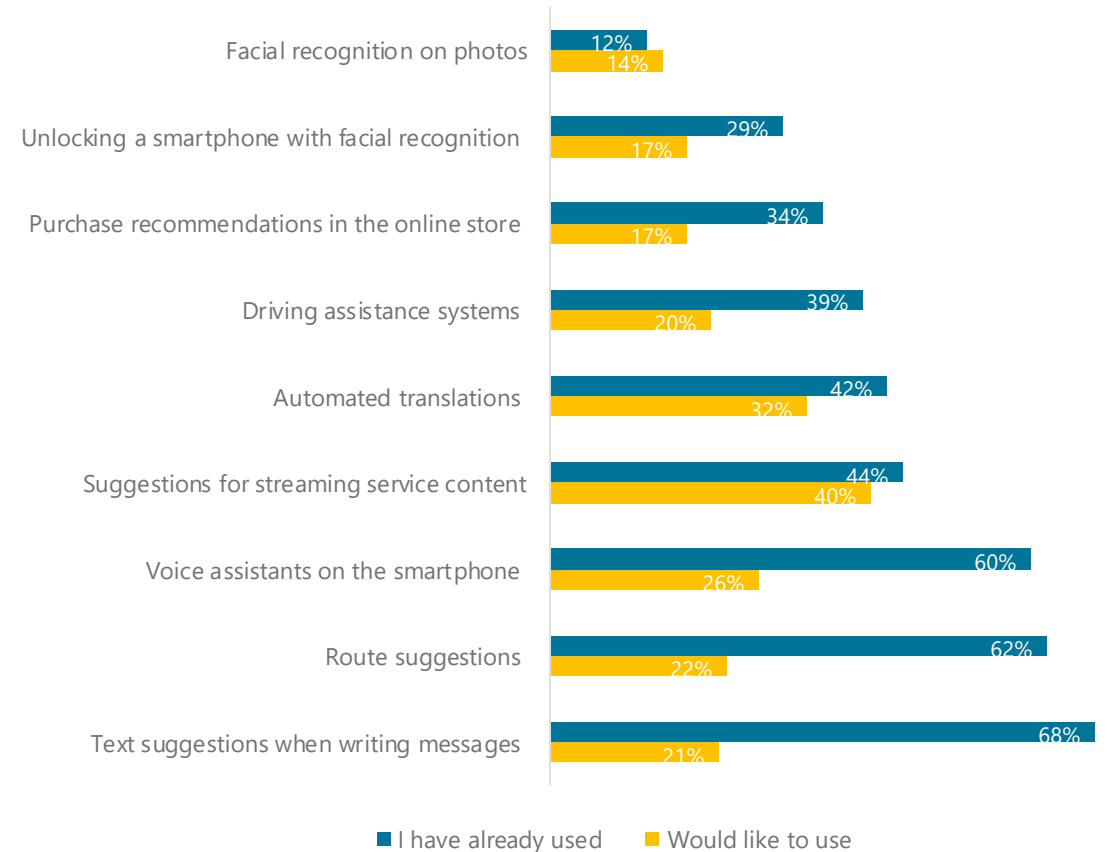# Which AI applications do we use in everyday life?

Text suggestions in messages take the no. 1 spot

An AI starts supporting us when we're writing a message. Based on individual usage, the smartphone suggests words that often follow the ones that have already been typed out. Autocorrect is also part of this.

According to the results of a study conducted by Bitkom Research in 2020, **68% of respondents have already used text suggestions in messages.** This is closely followed by route suggestions in map apps (62%) and voice assistants on smartphones (60%).

AI applications in our everyday life

Application	I have already used	Would like to use
Facial recognition on photos	12%	14%
Unlocking a smartphone with facial recognition	29%	17%
Purchase recommendations in the online store	34%	17%
Driving assistance systems	39%	20%
Automated translations	42%	32%
Suggestions for streaming service content	44%	40%
Voice assistants on the smartphone	60%	26%
Route suggestions	62%	22%
Text suggestions when writing messages	68%	21%

■ I have already used   ■ Would like to use
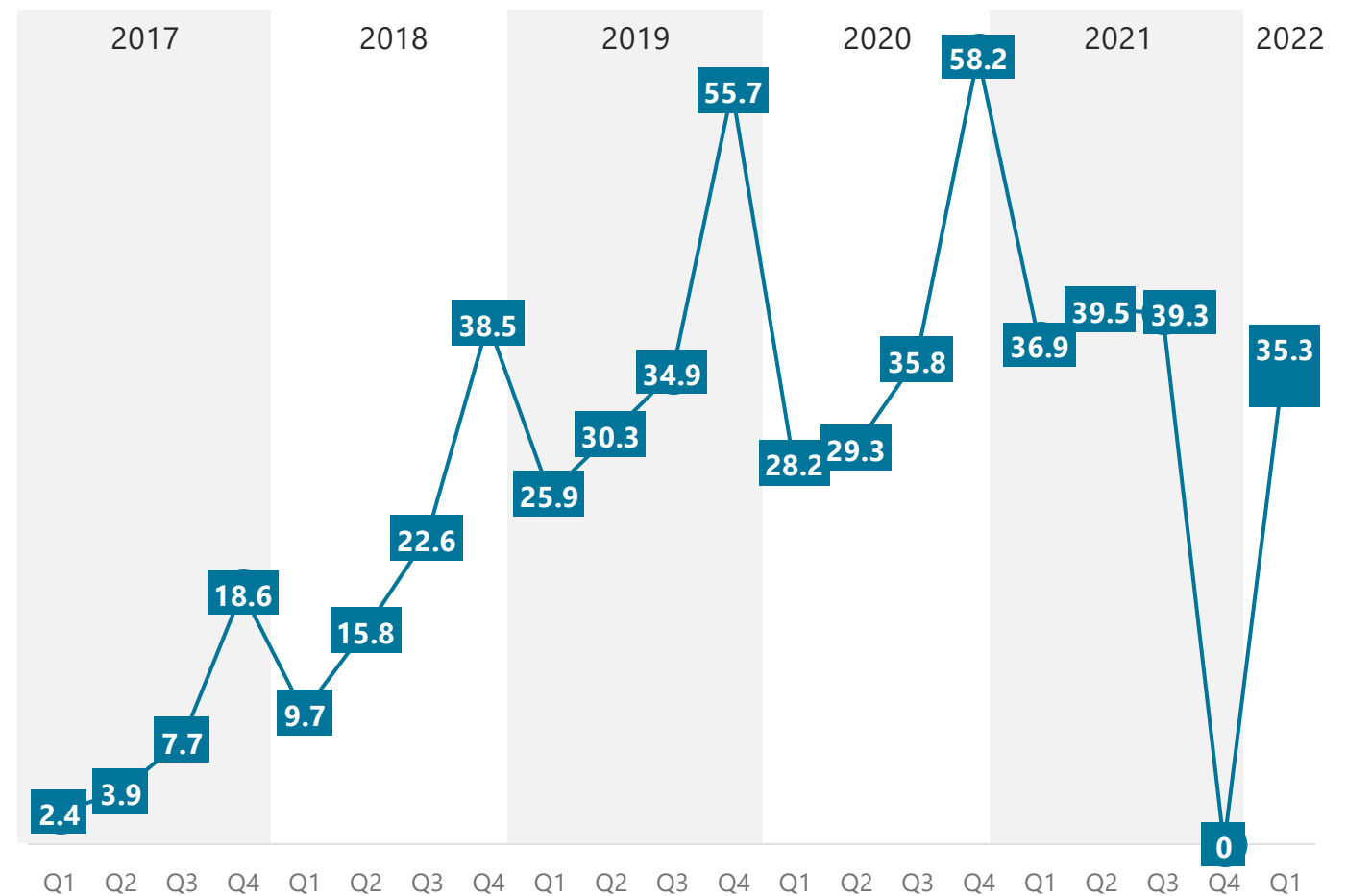
Source: Bitkom Research. 2020.

Our very own personal assistants: Alexa, Siri & more

Voice assistants on the rise

Apple's Siri, Amazon's Alexa, as well as Google Assistant, use AI to respond to spoken commands and answer questions.

Sales of smart speakers have increased immensely in recent years. At the end of 2016, for example, it still stood at 4.6 million units worldwide. At the beginning of 2022, barely 5 years later, it was already 35.3 million units - **a sevenfold increase!**


| 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |

2.4 3.9 7.7 18.6 9.7 15.8 22.6 38.5 25.9 30.3 34.9 55.7 28.2 29.3 35.8 58.2 36.9 39.5 39.3 0 35.3

Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1

AI applications already used in our everyday lives

These technologies already use AI.

- Text suggestions when writing emails, SMS and in messenger services
- Route suggestions in map apps and navigation systems
- Voice assistants on various devices
- Streaming recommendations for music and movies
- Tools for automatic translations
- Driving assistance systems for parking
- Purchase recommendations in online shops
- Face recognition in photos and for unlocking smartphones
- Smart health applications
- Smart living - heating, lighting, etc.
- Spam filters in e-mail inboxes
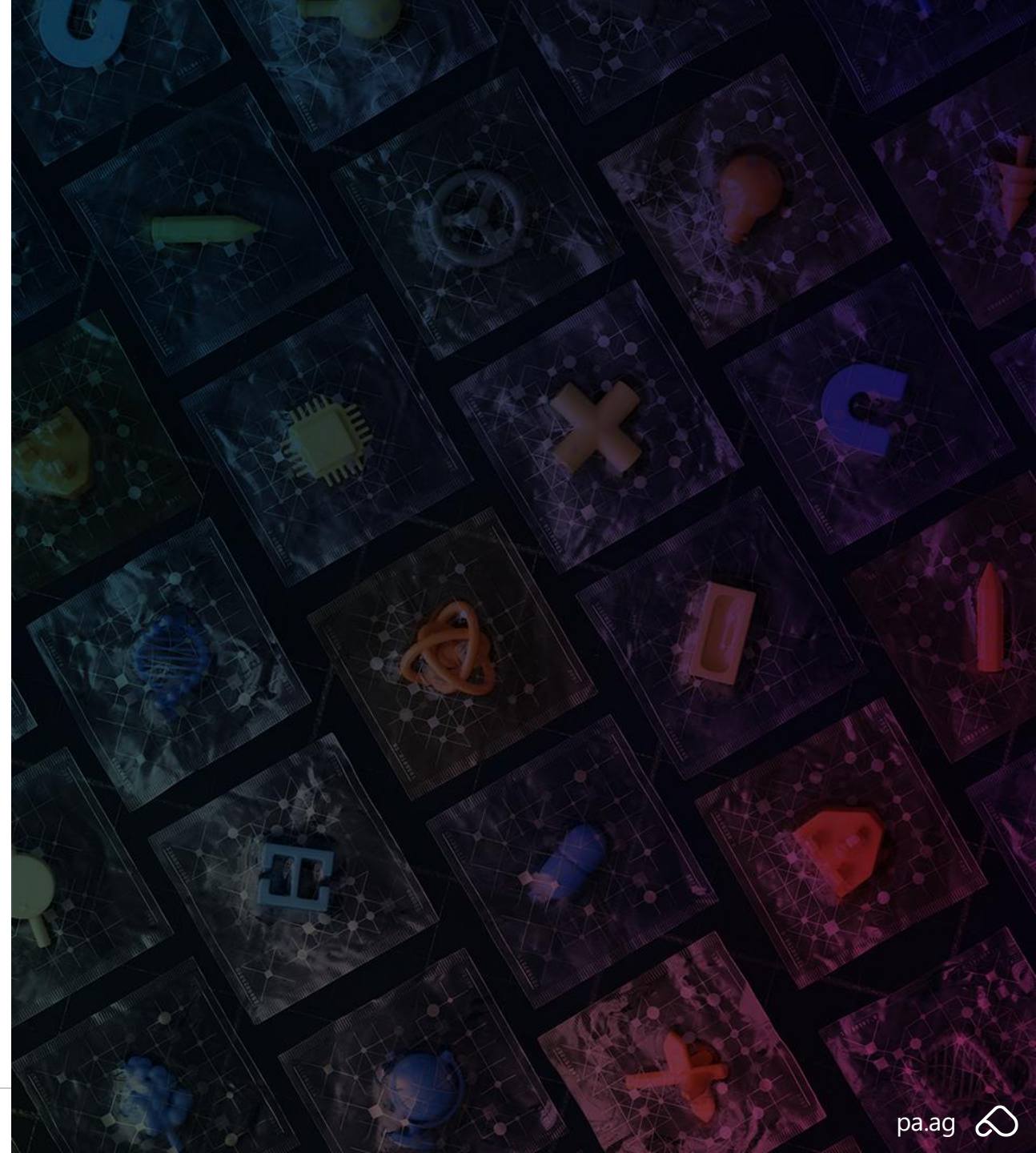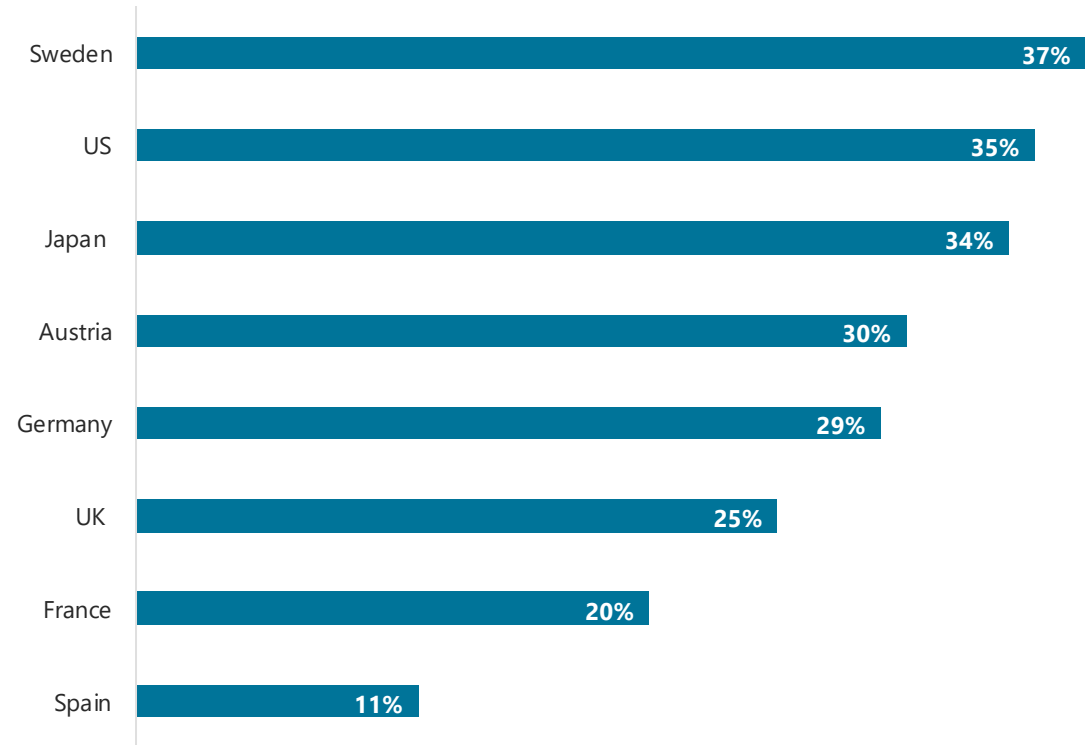
Increasing productivity or threatening jobs?

Artificial intelligence for businesses and the industry

AI has the potential to increase companies' productivity. According to Accenture, we could see **an increase of up to 39%** in some countries by 2035. Sweden is in first place in this forecast, while productivity increases of 20% and 30% are predicted for Germany and Austria.

Even with advances in automation, manpower is still needed. For example, according to McKinsey statistics, **15% of companies in the global automotive industry have seen AI-related workforce reductions** of 3-10% in 2019. However, this is offset by **an increase in programmers and engineers**. In retail, the increase (23% of companies) is actually much higher than the decrease (16% of companies).

Artificial intelligence = higher productivity - increase in labor productivity through AI by 2035

Country	Value
Sweden	37%
US	35%
Japan	34%
Austria	30%
Germany	29%
UK	25%
France	20%
Spain	11%

Source: Statista: Accenture, Frontier Economics

Artificial intelligence as a workforce

AI can cause growth or cutbacks in different industries

The impact of AI on the global workforce

Industry				
Health Systems & Services	5%	15%	2%	
Electricity & Gas	6%	10%		
Travel & Transport	9%	11%		
Pharmaceuticals & Medicine	12%	6%	3%	
Finance sector	4%	13%	14%	1%
Retail	2%	16%	23%	4%
Infrastructure	1%	19%	8%	3%
Telecommunications	2%	21%	12%	4%
Automobiles	8%	15%	10%	1%

■ Reduction of workforce by more than 10%   ■ Reduction in workforce between 3% and 10%.   ■ 3% to 10% increase in workforce   ■ More than 10 % increase in workforce

Source: McKinsey 2019.

Pretty personal: AI in marketing and sales

Automation, personalisation and optimisation

- **Customised content:** AI is used to create customised content and recommendations based on customers' interests and preferences.

- **Customer service:** AI-driven chatbots and virtual assistants can automatically answer customer queries and improve customer service.

- **Predictive analysis:** AI is used to make predictions about customer behaviour and interest.

- **Marketing process automation:** AI-driven automation helps companies automate and optimise marketing processes such as sending emails or placing ads.

- **Search engine optimisation:** AI-driven algorithms can help companies optimise their websites and content for search engines to drive more traffic.

- **Social media marketing:** AI-driven tools can help businesses improve their social media strategies by performing analysis of trends and customer behaviour as well as by automatically publishing posts and ads.

- **Online copywriting:** AI can assist in creating blog posts, copy for product or category pages, and other types of online copy.

Global spendings
# on the new intelligence

Spending on artificial intelligence doubled

Companies opt for automation

Investments in the use of AI in companies are increasing every year. According to IDC, global spending is expected **to reach $300 trillion USD by 2026**. This is more than double the 2022 figure ($118 trillion).

Forecast for the development of global spending on AI

300

118

2022

2026

■ Global spending on AI in USD trillion
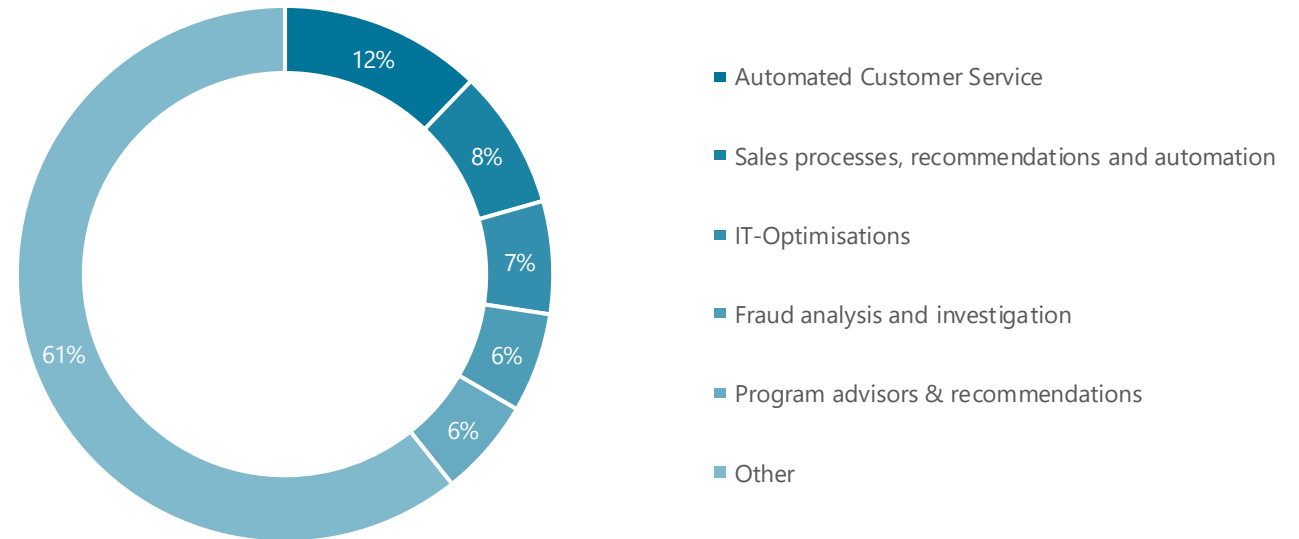
Source: IDC 2022.
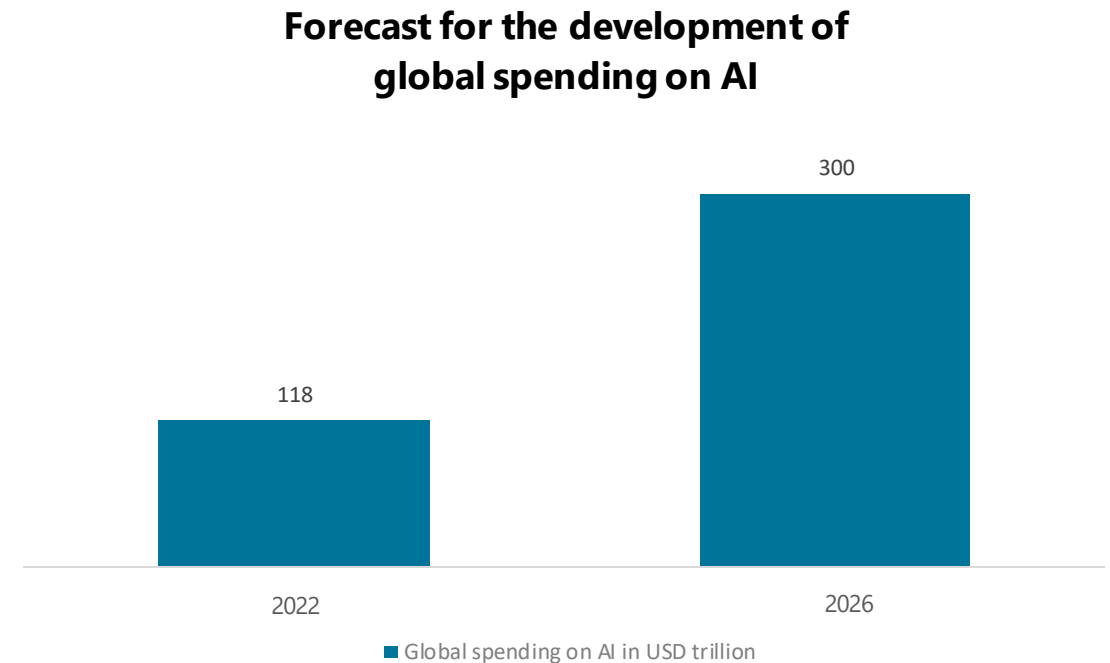
12% of spending goes to automations

Better processes, automatic responses and detailed analyses – all thanks to AI

Investments will be placed in automated **customer service agents (12.2%)**, closely followed by **automation and recommendations in sales processes (8.4%) and IT optimisations (6.8%)**. Companies expect to save money, since what is automated is not affected by human errors and workloads.

Most of the output was used for these applications

- 12%
- 8%
- 7%
- 6%
- 6%
- 61%

- ■ Automated Customer Service
- ■ Sales processes, recommendations and automation
- ■ IT-Optimisations
- ■ Fraud analysis and investigation
- ■ Program advisors & recommendations
- ■ Other

Source: IDC 2022.

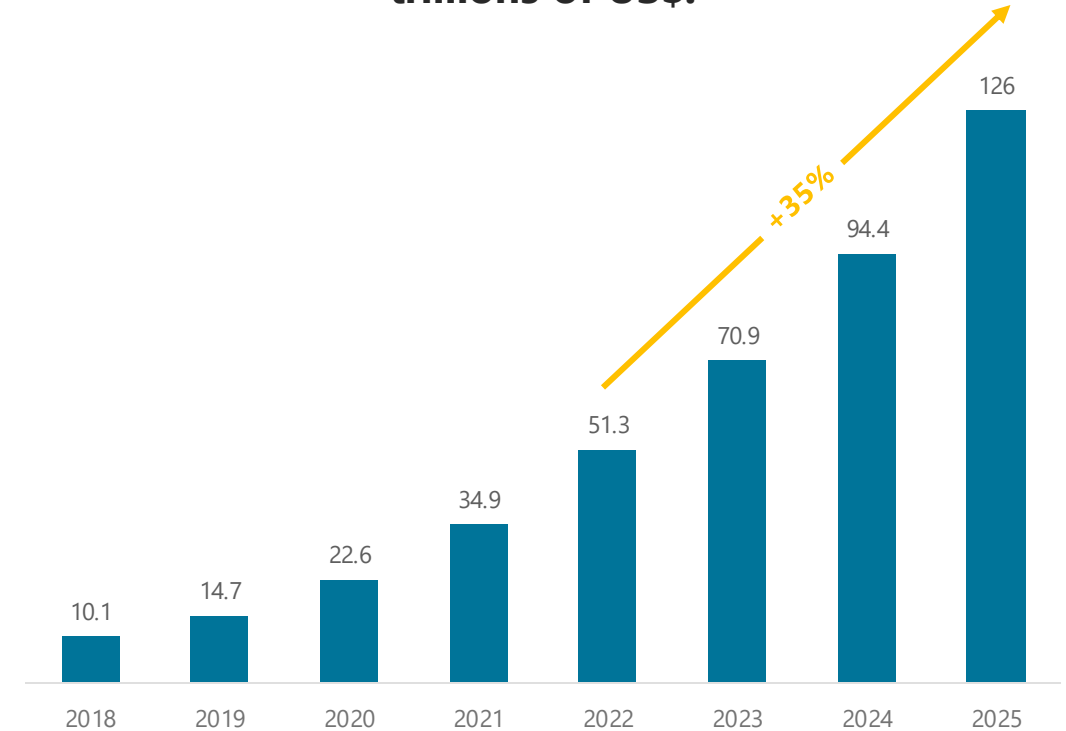# Steep sales trends expected until 2025

Artificial intelligence is flooding money into tills worldwide

The trend is also skyrocketing in terms of revenue. According to a forecast by Statista & IDC (2022), global revenue in the application fields of hardware, software, and IT services could amount **to around $126 billion USD in 2025**.

In comparison, sales in 2021 were $34.9 trillion USD.

Forecasts of global AI software sales in trillions of US$.

+35%

Year	Value
2018	10.1
2019	14.7
2020	22.6
2021	34.9
2022	51.3
2023	70.9
2024	94.4
2025	126

Source: Tractica

pa.ag

Calculated feelings and empathetic robots

ChatGPT, can you be emotional?

" *Als künstliche Intelligenz habe ich keine Emotionen im herkömmlichen Sinne, da ich kein menschliches Wesen bin. [...] Ich kann [...] auf bestimmte Wörter oder Phrasen reagieren, um ein gewisses Maß an Empathie zu zeigen, aber meine Antworten basieren immer auf logischen Regeln und Algorithmen. Insgesamt bin ich jedoch nicht in der Lage, menschliche Emotionen zu empfinden oder zu verstehen.*

Reply by ChatGPT, 2023

Only a learning AI is an evolving AI

Learning to understand emotions comes first.

Human emotions are so complex that until now it seemed almost impossible to make them perceptible by machine. Facial expressions, gestures, context, the small subtleties in face, speech, movement and smell - such things can only be perceived with real senses, right?

The rising popularity of technologies like chatbots shows that people are drawn to human-like interaction. Trends in AI innovation strive to interact in a more human-like manner, to be more human-like. That means understanding emotions and imitating emotions. We refer to it as **EI for short - Emotional Intelligence.**

Emotional Intelligence (EI) is (actually) the ability of people to distinguish between different emotions and to use these emotions to guide their thinking and behavior. (Emotional) thinking is a step-by-step process with a degree of sequences. These sequences will also be used for artificial emotional intelligence in the future.

AI systems use emotional intelligence - then what?

Emotional robots, empathetic chatbots and moral decisions

AI systems could learn the processes of emotional thinking, mimic respective emotions based on various triggers, and make decisions.

In the future, AI systems with improved emotional capabilities could focus more on interaction and better understand their users.

Natural language processing, speech recognition and chatbots would play an important role here, as they would be the most important triggers.
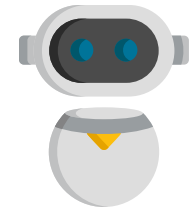
Robots would have more and more human-like abilities in the future. Thanks to EI & AI, they would be able to react better and more emotionally to their environment and users.

Human vs AI:
why AI needs a parent or guardian

Driver's license for artificial intelligence

Trust is good, but control is better – at least in this case

We have seen by now that AIs are very smart. The trends are unstoppable, and their use is becoming more and more integrated into everyday life and work. However, we **should not blindly trust AI.** There are very simple reasons for this:

AI output depends on the quality of the training data as well as the given instructions (prompt). AIs often don't take the quality of data into account (e.g., too small of a sample size). Furthermore, AIs are not always totally trustworthy and the information they provide can lead to misconceptions.

Using ChatGPT to generate content without having to do your own research or writing can save time, but beware: the machine only combines information it finds online. You have to do an accuracy check. **ChatGPT is not a trustworthy source**, because we can't tell exactly where it gets its knowledge from.

What is convincing, however, is the text quality. It is comparatively good, as shown in Peak Ace CEO Bastian Grimm's case study, held at SEOkomm 2022.

AI text quality – judged blind by readers

Case study by Peak Ace CEO Bastian Grimm at SEOkomm 2022

The content quality of AI-produced texts is surprisingly good. However, what do readers like better? Can you tell the difference between AI-produced texts and human-written texts? A small case study by Peak Ace CEO Bastian Grimm at SEOkomm 2022 shed some light on this:

The participants had two texts in front of them:

- **Version A** was **created by a human**,
- **Version B** was **generated by a machine**.

The readability of the AI texts is better

Machine-created text gets slightly better ratings.

The Flesh index indicates that **improved readability is characterised by shorter sentences**. In Bastian's study, the AI-produced content comes out on top with a slightly **higher Flesch score** in each group. Based on Flesh, it's thus **considered "better"**.

GPT-3 tends to take this into account, meaning that more complex sentence constructions are less likely to be found in text variant B. The specific **comparison based on the Flesch index** underlines this thesis.

124

Which text do you like better? (Group 1)

Text A
49.2%

Text B
50.8%

142

Which text do you like better? (Group 2)

Text A
53.3%

Text B
46.5%

146

Which text do you like better? ? (Group 3)

Text A
49.3%

Text B
50.7%

116

Which text do you like better? (Group 4)

Text A
50%

Text B
50%

More catchy writing and shorter sentences

AI focuses on conciseness

Shorter sentences make the AI texts slightly **easier to read**. The machine opts for conciseness instead of complex sentence structures. Only **one group liked the human-written text better**.

Nevertheless: a certain **caution is still required in dealing with AI**. The AI needs precise instructions (so-called prompts) in order to write meaningful texts. In addition, content, statements and potential sources need to be carefully examined. If you want to create high-quality, innovative content, you need more than just a machine. However, the **machine text can always serve as good inspiration**.

124

Which text is catchier and reads better? (Group 1)

Text A
45

Text B
45

142

Which text is catchier and reads better? (group 2)

Text A
38

Text B
45

146

Which text is catchier and reads better? (Group 3)

Text A
29

Text B
41

116

Which text is catchier and reads better? (Group 4)

Text A
53

Text B
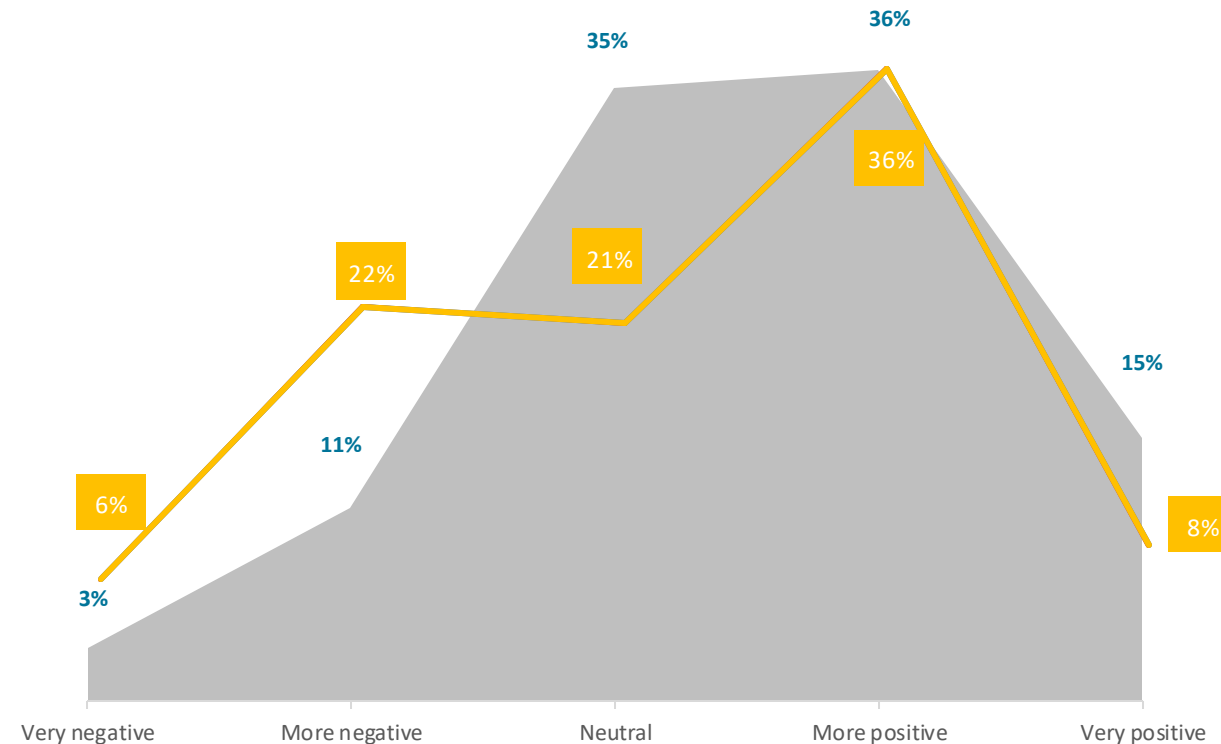50

How morally sound is AI?

AI: Increasingly positive reputation in society

The attitude towards AI is constantly changing

The more natural something becomes for us, the better we rate it. **AI has managed to gain a much more positive reputation in society in recent years.** Just two years ago the perception of AI was more negative, but neutral to positive attitudes are now on the rise.

In 2021, the **percentage of people who rate AI positively was already at 51%**. The increase in the negative to neutral assessment of AI is 14% (2022).

Change in attitudes torwards AI from 2019 to 2021

	Very negative	More negative	Neutral	More positive	Very positive
2019	3%	11%	35%	36%	15%
2021	6%	22%	21%	36%	8%

Source: TÜV-Verband, 948 (2021) Respondents aged 16-75 who know the term artificial intelligence
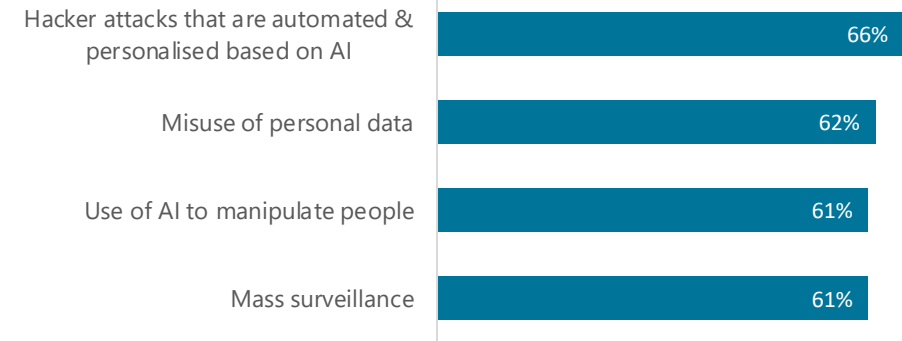
For risks and side effects, ask your advisor

AI remains a socially sensitive topic

Concerns about the risks involved in dealing with AI remain. A look at the attitudes of people in Germany shows that **security risks in particular play a major role** here. 79% of respondents to a study by the TÜV Association see new IT security risks in the use of AI in companies.
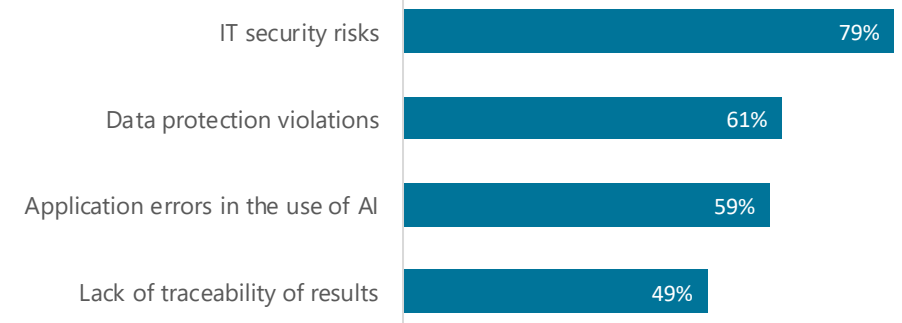
In private life, **concerns about personal data**, personal rights and personal freedom are at the top of the list.

How big are your concerns in different areas of application for the AI?

Hacker attacks that are automated & personalised based on AI	66%
Misuse of personal data	62%
Use of AI to manipulate people	61%
Mass surveillance	61%

What risks do you think arise from the use of AI in companies?

IT security risks	79%
Data protection violations	61%
Application errors in the use of AI	59%
Lack of traceability of results	49%

Source: Graphic 1: Bitkom, Graphic 2: TÜV-Verband, August 2021

Humans at the center of technologies

The challenges we face with artificial intelligence
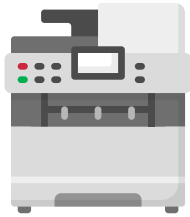
Autonomous machines

Who is liable for decisions made by autonomous machines? How much trust can be placed in machines and their trained skills?

Discrimination & inclusion

Pre-programmed tendencies can cause machines to categorically exclude people. This can not only discriminate but have other fatal consequences.

Algorithmic profiles

Calculated customisation is a double-edged sword. It can attack pluralism (political & cultural) and have a negative impact on diversity.

Source: https://pa.ag/3JaXJxE

Humans at the center of technologies

The challenges we face with artificial intelligence

Huge amounts of data

AI thrives on data, while laws ensure that personal data becomes unassailable. How can AI develop further if this data remains under wraps?

Data selection

Software results are based on data. We cannot always evaluate the quality and quantity of the data. Therefore, caution is required for decisions made by AI systems.

Human robots

Robots that react in a more and more human-like manner will also evoke emotion in people. How will these situations be handled in the future?

Code of ethics for artificial intelligence

What is AI allowed to do, what not, and who is responsible?

1. Paternalism of humans by artificial intelligence is to be avoided.

2. AI must be reliable and protect against harm.

3. Data protection and personal rights still come first. Data must be checked for integrity (i.e., whether it is being used to discriminate unlawfully or unfairly).

4. AI data and processes must be traceable and explainable. When the same data and AI algorithms are entered into a system, the result must always be the same.

5. No person may be disadvantaged or discriminated against by AI because of their cultural, religious or gender background. Access to services must be equal and non-discriminatory.

6. It is always necessary to check what impact AI systems have on society and the environment.

7. Clarify who is responsible and legally accountable for AI systems and their outcomes to ensure the fairness of AI systems.

In conclusion:
the future is now!

Concerns and potentials for the future

Human support remains necessary for AI

Even though there are a lot of concerns about possible data leaks and more vulnerability: everything is pointing to AI. The future will be more and more automated - in our everyday lives and in work. Our whitepaper shows that AI already supports many areas of our lives, sometimes even without us realising it. There is almost no one who doesn't use AI to some degree – whether they're unlocking a smartphone or using search engines.

The economy is implementing the trend at full speed, because AI has a lot of potential for companies to reduce costs and increase sales. Used smartly, it can already reduce workloads and free up time for new ideas and innovation. All the tasks that machines can't take on require sharp human judgment, because if everyone used AI for their strategies, everyone would have the same ones – and that would be pretty boring.

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