

2021 Trend Study

ARTIFICIAL INTELLIGENCE

The future of artificial intelligence
in German companies.

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UNIVERSITY OF
APPLIED SCIENCES

EXECUTIVE SUMMARY

ARTIFICIAL INTELLIGENCE IN COMPANIES. IN A NUTSHELL:

Artificial intelligence (AI) has arrived as a strategic issue in German companies.

There is now an awareness at management level in particular – 71 % of the respondents from lower to upper management are already engaging with AI.

In contrast to what public debate suggests, employees also tend to view the use of AI as an opportunity – 75 % of those surveyed mostly hope that AI will enable them to work more efficiently.

This study also clearly shows that there is still a lack of concrete planning to actually implement AI in companies in strategic terms. Only 14 % of the respondents said that they are already currently using AI. **At the same time, companies lack the necessary expertise to comprehensively implement AI. As a result, there is an implementation gap that needs to be bridged in the future.**

AI offers huge opportunities for innovation and new business models. For Germany alone, the potential sales growth in the current decade is estimated to be **over 430 billion euros***. But this depends on companies translating the significance of the issue into concrete plans and projects – and in particular developing the necessary expertise. This study highlights the essential competences and what is required to develop the relevant skills.

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*PwC: <https://www.pwc.de/de/pressemitteilungen/2018/pwc-studie-beziffert-potenzial-kuenstlicher-intelligenz-auf-430-milliarden-euro.html>

BRAVE NEW WORLD?

“It’s going to be interesting to see how society deals with artificial intelligence, but it will definitely be cool.”

Colin Angle, CEO iRobot

WHAT DOES AI MEAN?

“The study of how to make computers do things at which, at the moment, people are better.”¹

“A field of study that seeks to explain and emulate intelligent behavior in terms of computational processes.”¹



BIG DATA



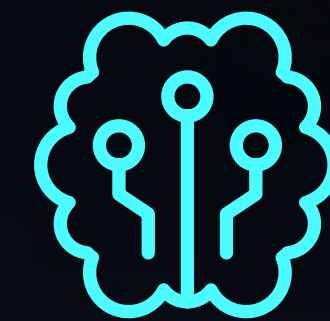
**ROBOTIC PROCESS
AUTOMATION (RPA)**



MACHINE VISION



AUTOMATION



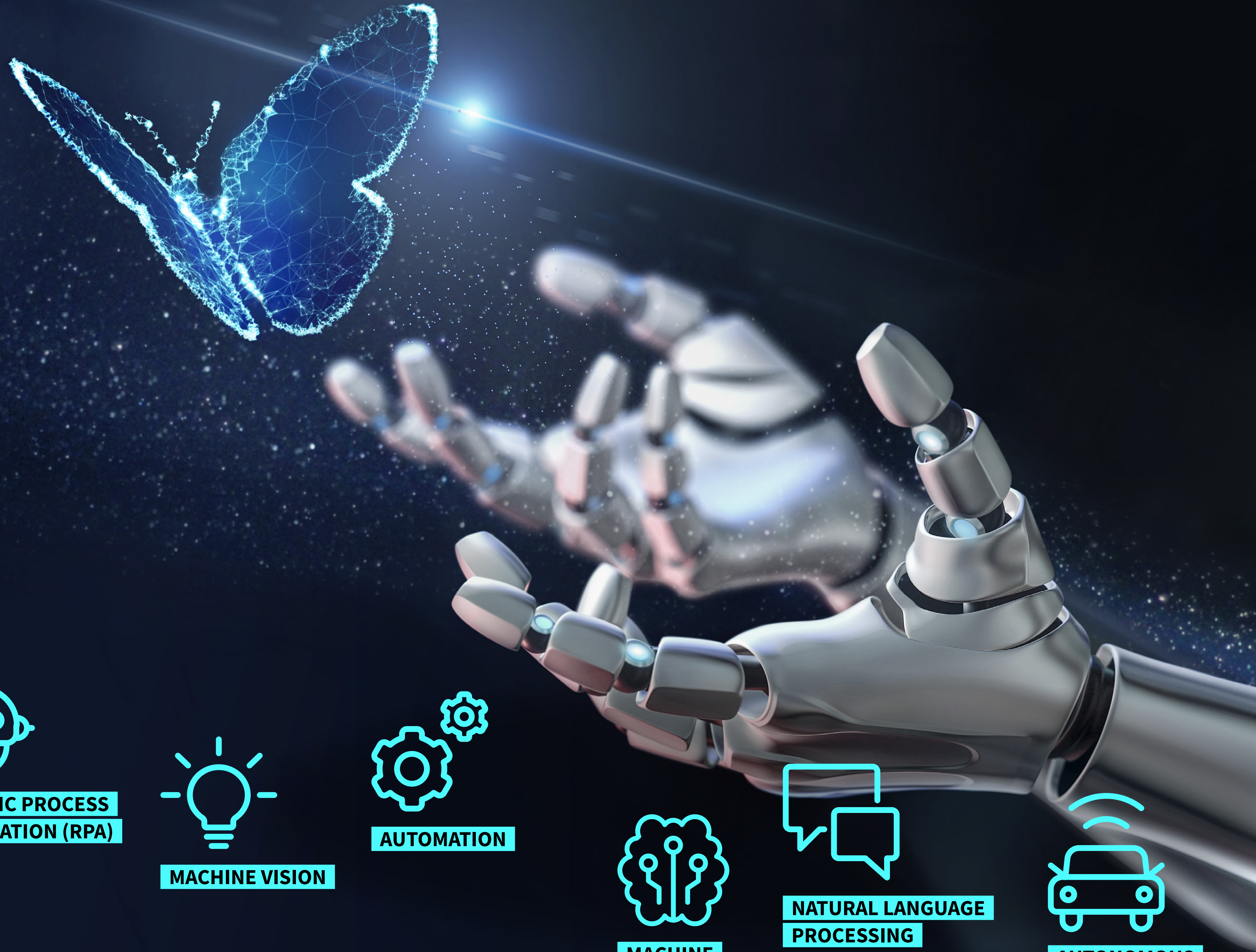
**MACHINE
LEARNING**



**NATURAL LANGUAGE
PROCESSING**



**AUTONOMOUS
VEHICLES**



FIVE INITIAL HYPOTHESES

01

**AI – A MAJOR
GROWTH FACTOR:**

The relevance of AI in companies is growing.

The relevance of artificial intelligence in companies is high. Approximately 43% of the respondents said that they consider the use of AI important at the present time. **This figure rises to over 60% when its future relevance is considered.**

02

**AI – TO HAVE OR
HAVE NOT**

The implementation of AI is far from complete.

AI has thus far been a strategic issue for management.

Over 70% of the respondents in managerial positions said that their companies are already specifically engaging with AI. **BUT: only 17.9% of those surveyed said that their company has all the necessary expertise in the field of AI.** There is also currently a lack of willingness to invest and of know-how for implementation.

03

**AI – STILL ROOM
FOR IMPROVEMENT.**

The potential is far from being fully exploited.

Companies have tended to have a short-term view of AI thus far. They don't yet fully appreciate the potential for growth. Only 14.3% are already using AI. **47.5% of all respondents said that they have not yet addressed the issue of AI in their company.**

04

**AI – UPSKILLING
THE FUTURE.**

There is a lack of knowledge – and expertise.

Over two-thirds of the staff surveyed said they do not have the necessary knowledge. And yet, less than a third are prepared to acquire the necessary skills. One in five believes that there is a lack of further training available for AI. And that upskilling is difficult for this reason alone.

05

**AI – PROBLEM SOLVER,
NOT JOB KILLER?**

Most staff have positive expectations.

Only 2.9% of respondents in staff positions believe that too much AI is being used in their company. Over three-quarters of the respondents are only slightly concerned that their jobs will be taken away by AI or will become completely superfluous.

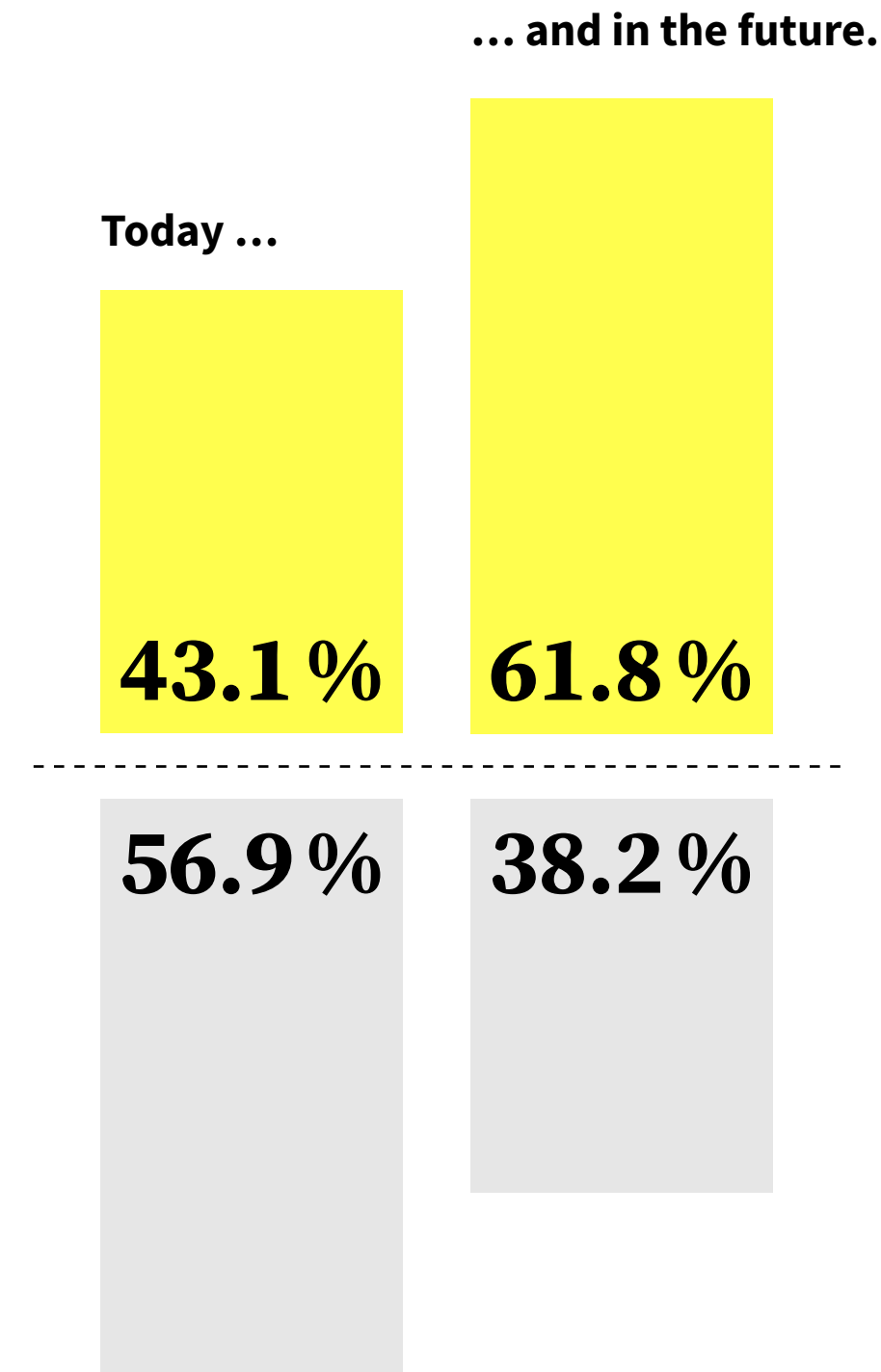
AI – A MAJOR GROWTH FACTOR

THE RELEVANCE OF ARTIFICIAL INTELLIGENCE IN COMPANIES

There is no doubt: AI is becoming increasingly relevant. The relevance of artificial intelligence in companies is high. Approximately 43% of the respondents said that they consider the use of AI important at the present time. **This figure rises to over 60% when its future relevance is considered.**

How important do you personally consider the use of artificial intelligence to be in your company today and in the future?

■ Important ■ Not important

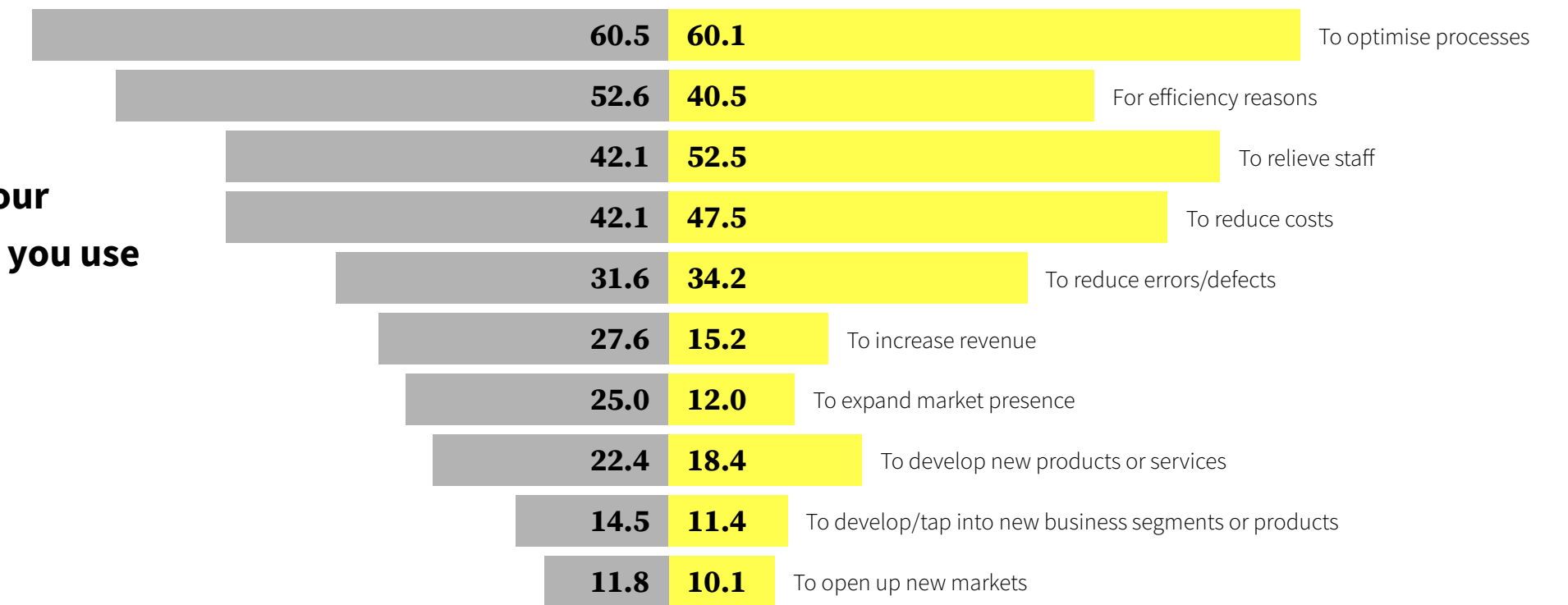


MAKING PROCESSES MORE EFFICIENT, SIMPLER AND MORE COST-EFFECTIVE.

Over one third of companies use artificial intelligence to optimise their processes. Both today and in the future. AI is primarily considered to have potential in reducing staff workload and saving costs.

Why do you use AI in your company? / Why would you use AI in your company?

■ Current use ■ Potential use
Values in %

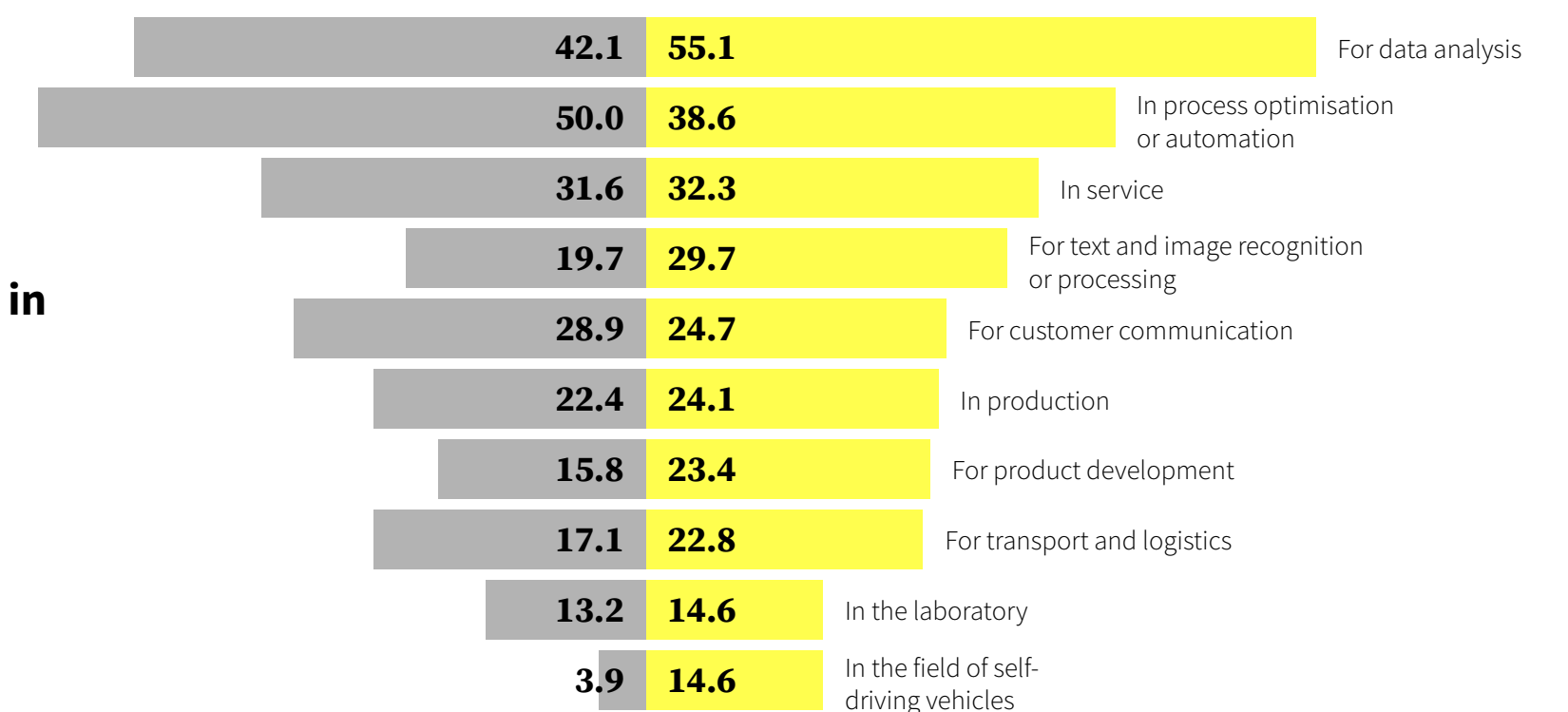


AI OPTIMISES BUSINESS.

Besides process optimisation, AI is used in particular for data management and analysis. And the trend is growing. AI is also favoured in customer communication (marketing automation) and in service. The respondents saw potential in particular in the area of product development and self-driving vehicles.

In which areas do you use AI in your company? / In which areas would you use AI in your company?

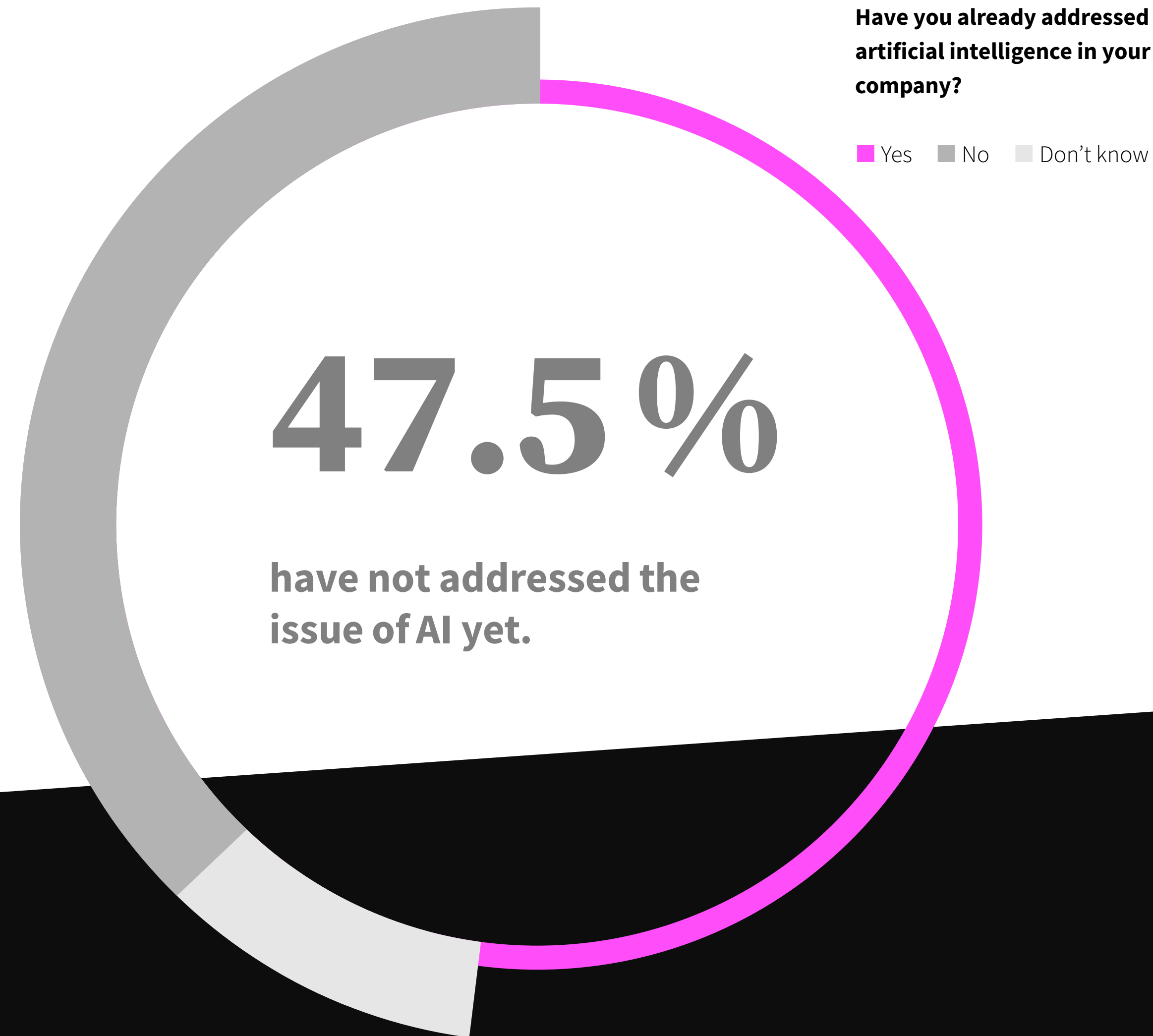
■ Current use ■ Potential use
Values in %



AI – TO HAVE OR HAVE NOT

IMPLEMENTATION OF AI IN COMPANIES

Almost half of the respondents said that they haven't yet addressed the issue of artificial intelligence in their companies. Therefore, in spite of the growing relevance, there is currently an implementation gap which will need to be bridged in future.



And what are the financial benefits?

Many of the respondents were unable to estimate the monetary value of their AI applications. 25% said that they had profited from AI.

Half said they didn't know. 14.5% did not give a specific figure. 9.2% of the respondents who are using AI applications are currently experiencing losses from AI applications.

AI. A MATTER FOR MANAGEMENT

Artificial intelligence in companies is primarily a matter for management. **Over 70% of the respondents in managerial positions said that their company is already specifically engaging with AI, and is either already using it or will do soon.**

Half the respondents in specialist staff positions say they don't know of any AI applications being used in the company. Another 14.3% are unsure. There is a clear correlation between knowledge of whether AI applications are being used and the size of the company. The bigger the company, the higher the number of respondents who don't know whether AI applications are being used.

Have you already addressed the issue of artificial intelligence in your company?

■ Yes ■ No ■ Don't know



It's crucial to put AI into practice now. The first step involves companies defining and evaluating use cases in detail.

This allows the experts from business and technology to determine the potential of specific projects together.

It is also important to operationalise tasks that can be realised using AI and data science, while strategically defining what a human task is and what a machine task is.

In doing so, it will become clear how decision-making processes need to change to tap the full potential."



Prof. Dr. Ulrich Kerzel
Professor for Data Science & Artificial Intelligence at IUBH

IMPLEMENTATION OF AI IN COMPANIES

Companies are still faced with major challenges when it comes to implementing AI.

Over 50 % of managers indicated that their staff lack important skills relating to AI. Only 17.9 % said that they have all of the necessary expertise.

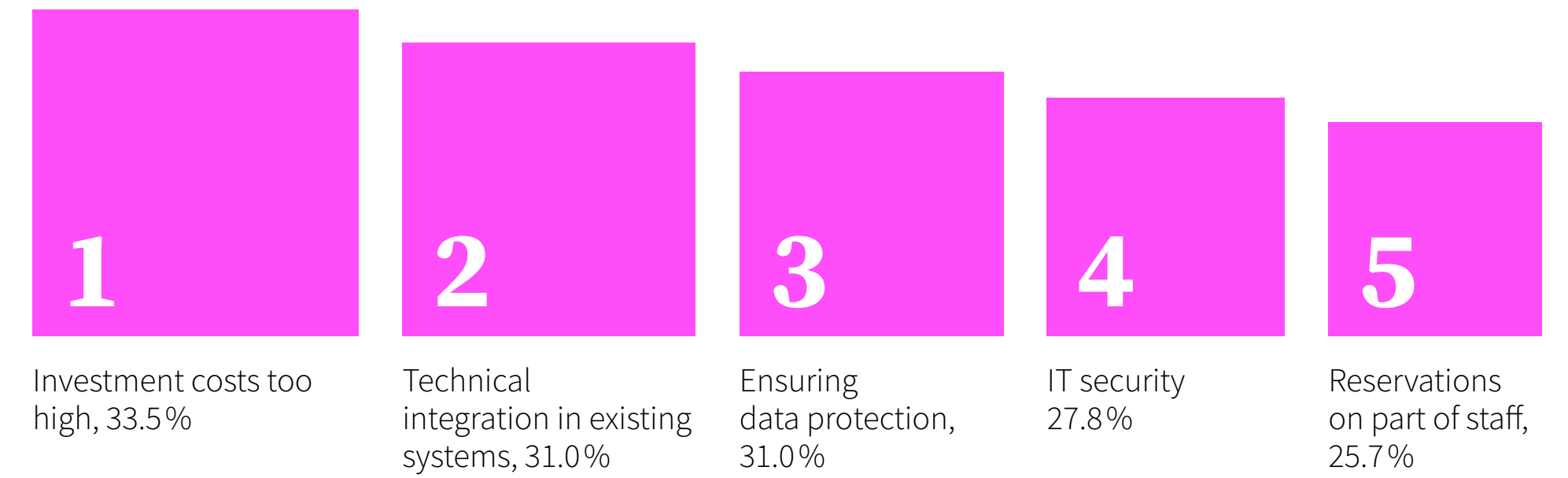
WILLINGNESS TO INVEST, TECHNOLOGY AND KNOW-HOW ARE LACKING.

Managers see a wide range of obstacles in the use of artificial intelligence. These include in particular **excessive investment costs, ensuring data protection and technical integration.**

One in every four managers said that their employees have reservations about AI applications. **And the lack of expertise among staff is another major obstacle for 19.6 %.**

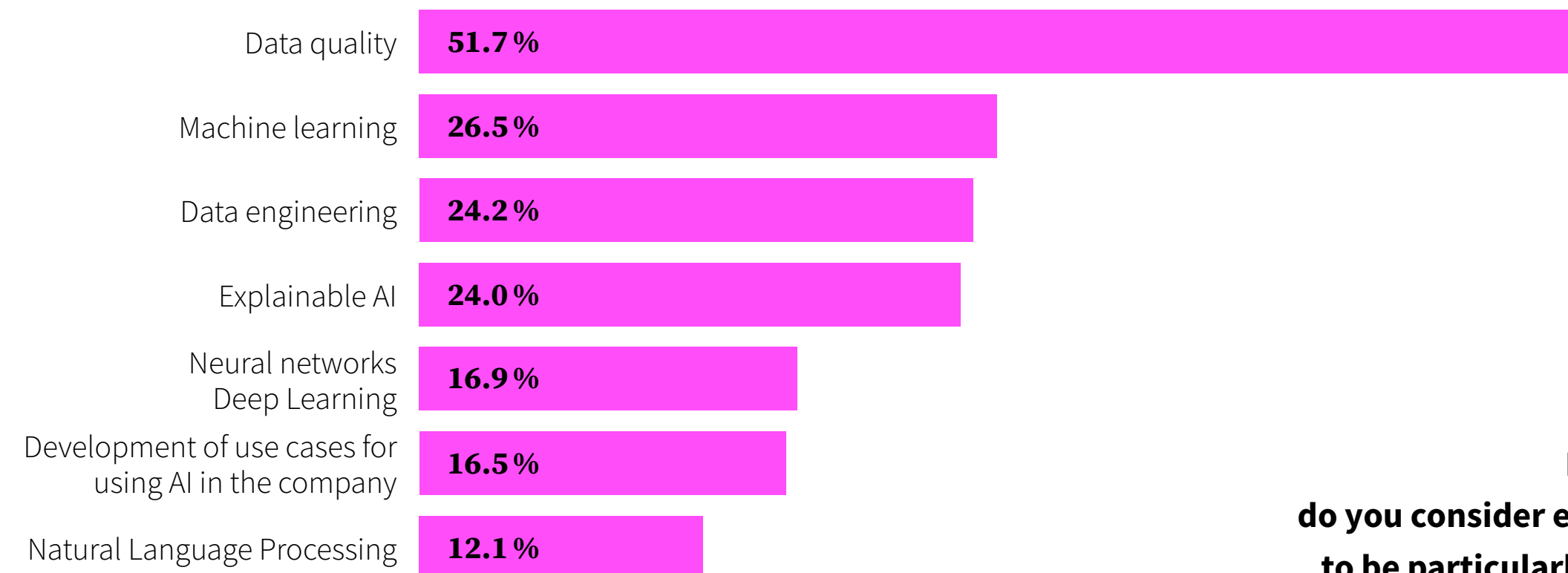
What are the main obstacles for your company when it comes to using AI?

Question to managers only, name 5 main obstacles.



BIG DATA IS IMPORTANT AND IN DEMAND.

There are areas in which AI is used, where staff with highly developed skills are particularly important. Skilled staff are required especially in the areas of **data quality, machine learning, data engineering and explainable AI.** Neural networks and the development of use cases are particularly relevant for large companies.



In what areas do you consider expertise in AI to be particularly important?

56.8 %

of managers said that their staff lack skills in AI.

Do your staff have the necessary abilities and skills to work with artificial intelligence applications?

Question to managers only.

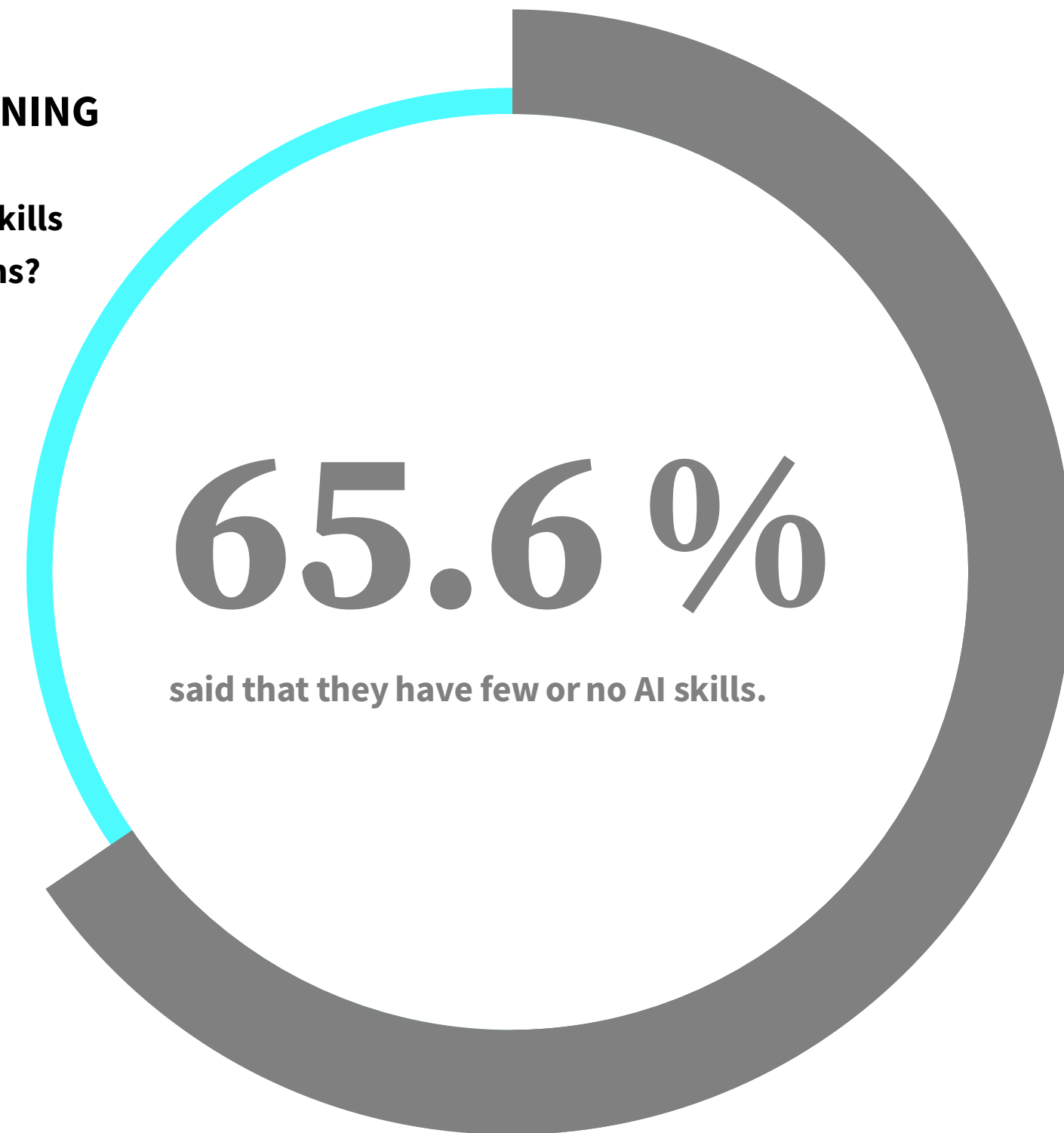
■ No ■ Yes

UPSKILLING THE FUTURE

LACK OF SKILLS AND MOTIVATION FOR FURTHER TRAINING

Do you personally have the necessary skills and abilities to work with AI applications?

■ Yes ■ No



Prof. Dr. Thomas Zöller
Professor for Data Science & Artificial Intelligence at IUBH

“In order to use AI effectively, companies need to develop internal expertise or buy AI applications as web platforms in the short term.

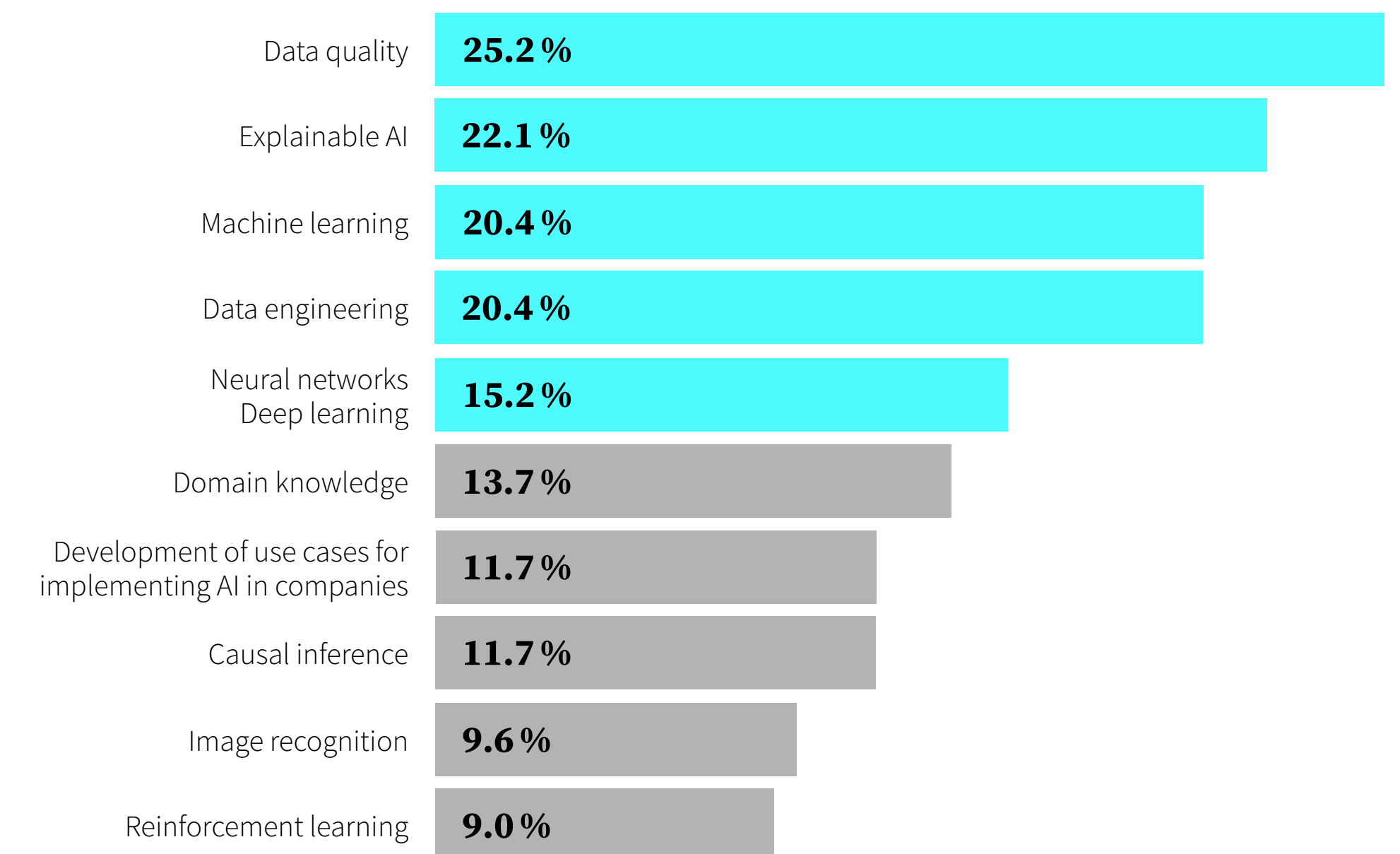
However: the more deeply integrated external services become, the less control you have over critical core processes. Either way – companies have to invest in the further training of their staff in AI in order to be able to keep assessing and managing their key competences.



THE TOP 10 MISSING SKILLS

17.9% of those surveyed said that they have all the necessary AI skills. However, there are some departments that aren't that far on yet.

In what areas in your company are skills most lacking?



Upskilling and reskilling ...

... are short-term measures used by companies to train their staff to be able to respond to the first waves of technological changes.

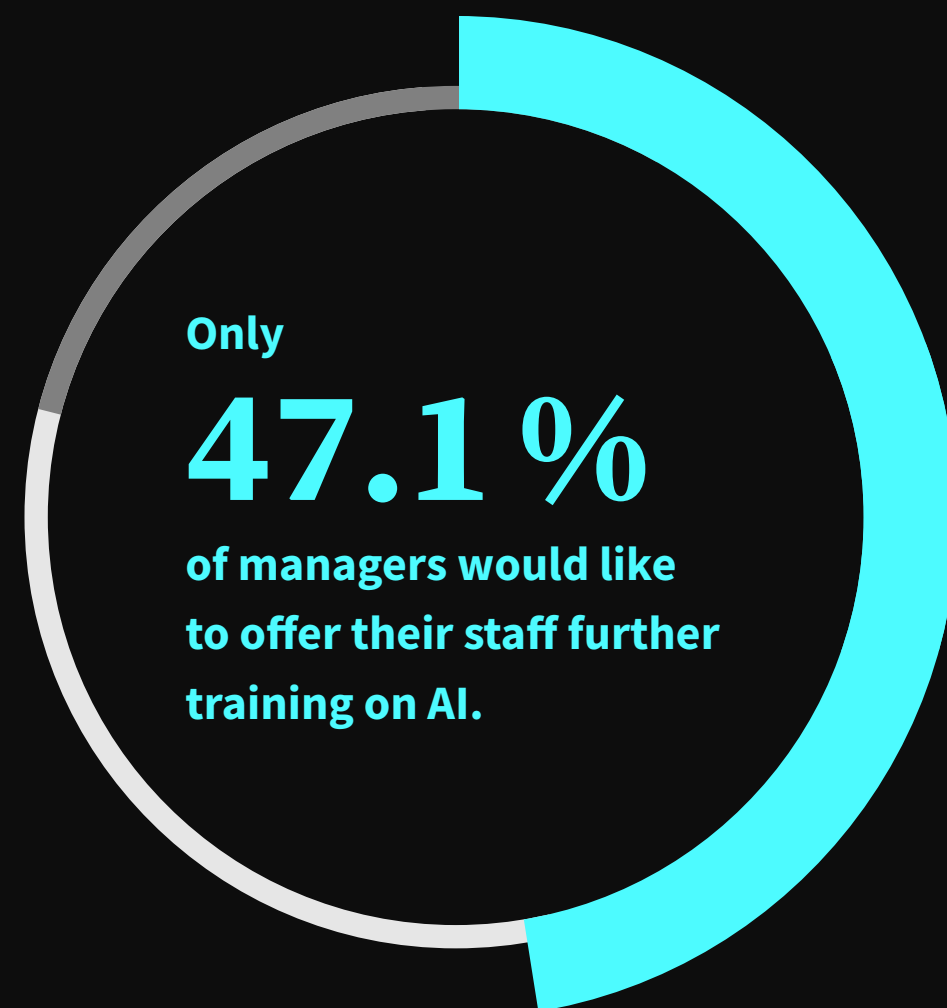
READY FOR UPSKILLING? MANAGERS VERSUS STAFF.

Companies face two problems when it comes to acquiring the necessary skills for AI. **Only just under half of managers are prepared to offer further training to their staff – and only one third of staff are willing to engage more deeply with the subject.**

Are you willing to train your staff so that they can routinely use AI?

Question to managers who said that their staff have few or no skills.

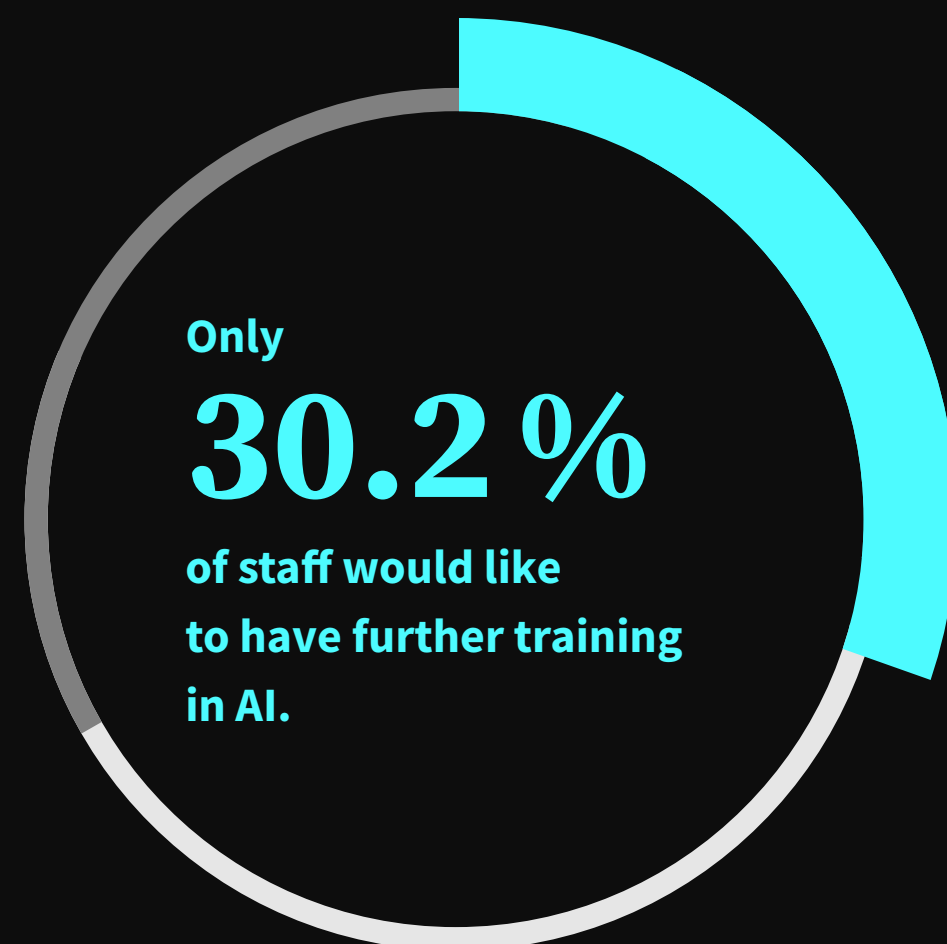
■ Yes ■ No ■ Don't know



Are you willing to acquire the abilities and skills required to use artificial intelligence?

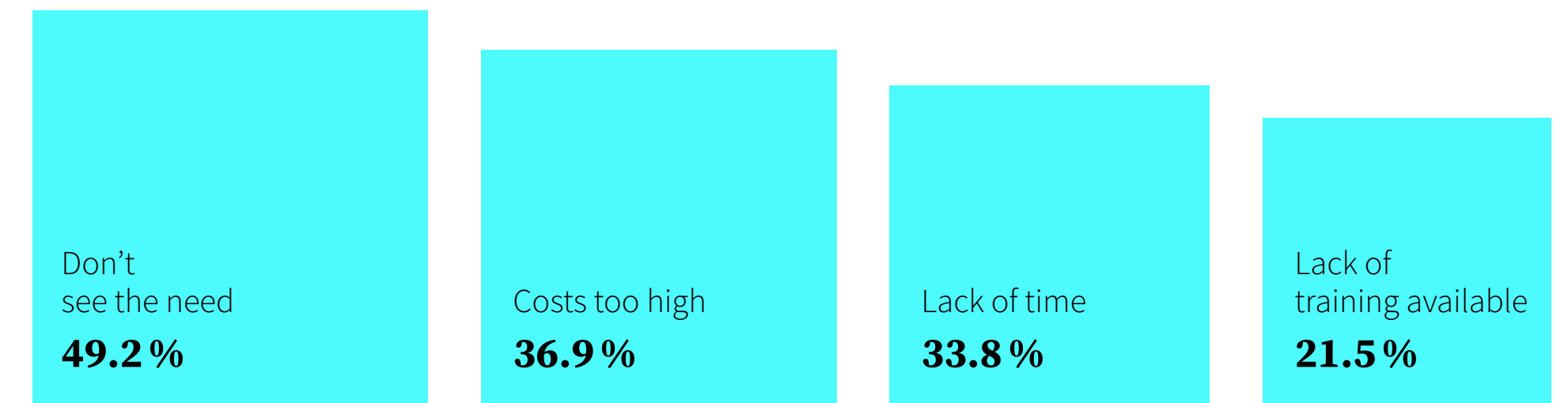
Question to people who, in their own opinion, don't have the necessary skills.

■ Yes ■ No ■ Don't know



What is stopping you from offering your staff further training?

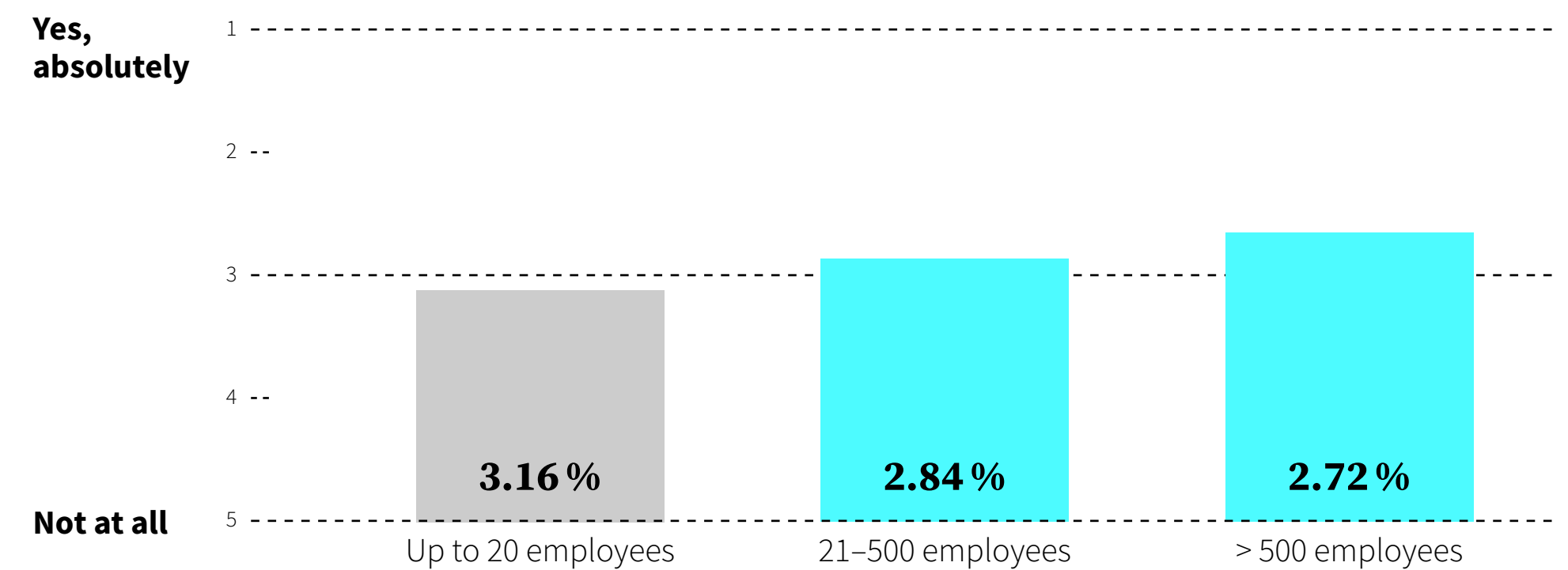
Respondents who are undecided about offering their staff further training.



THE BIGGER, THE BETTER.

Essentially the attitude towards artificial intelligence always depends on the size of the company. The bigger the company, the more likely it is to have the necessary resources and skilled staff to be able to use AI applications. The willingness to invest in further training for staff increases with the size of the company.

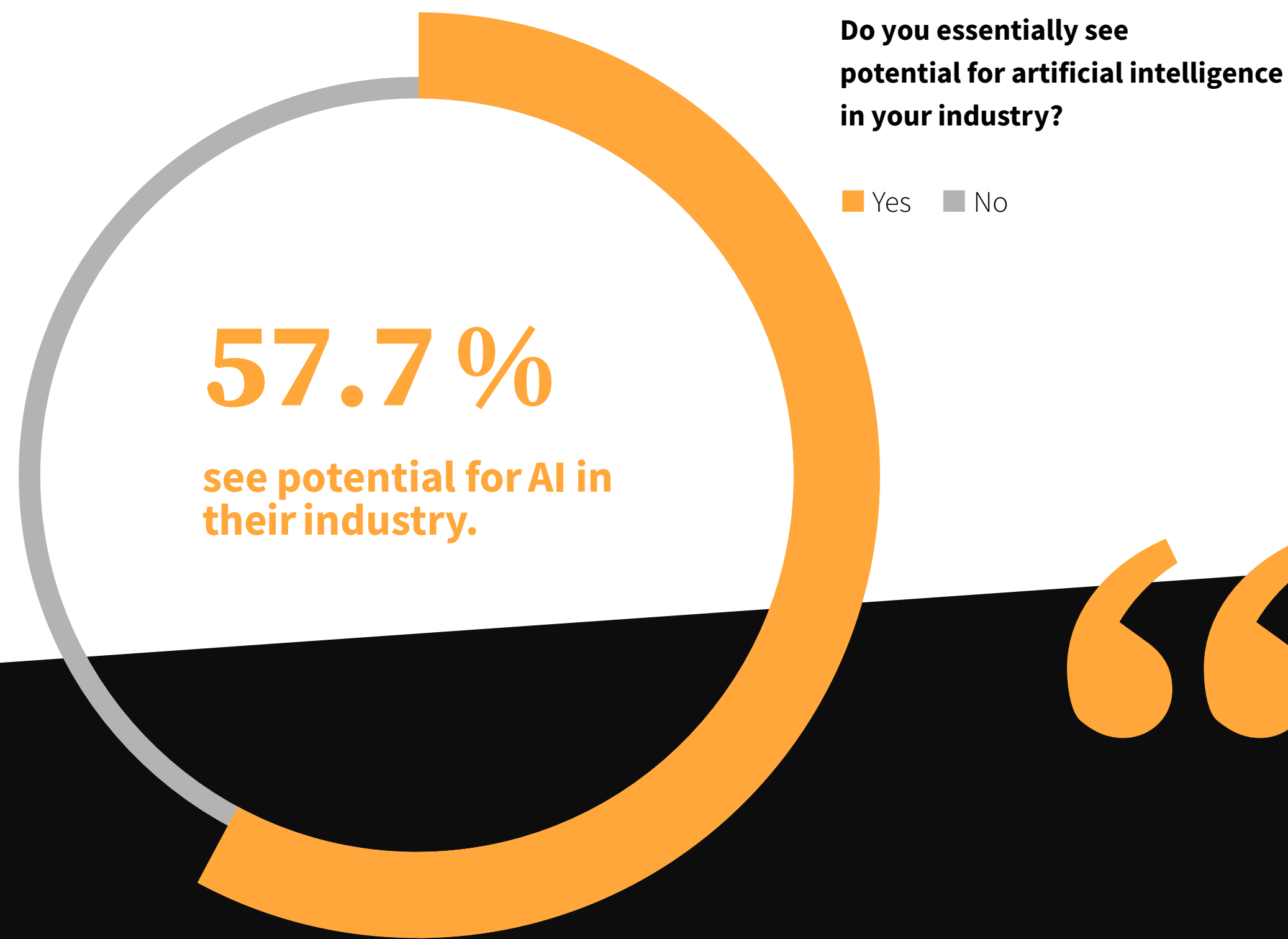
What do you think: do you personally have the necessary skills and expertise to work with AI applications?



STILL ROOM FOR IMPROVEMENT

THE POTENTIAL OF ARTIFICIAL INTELLIGENCE IN COMPANIES

The future is AI. On average over half the respondents essentially saw potential in AI in the future. The other half tended to see no potential or no need for AI applications. **Generally speaking: the bigger the company, the more AI is regarded as relevant for the future.**

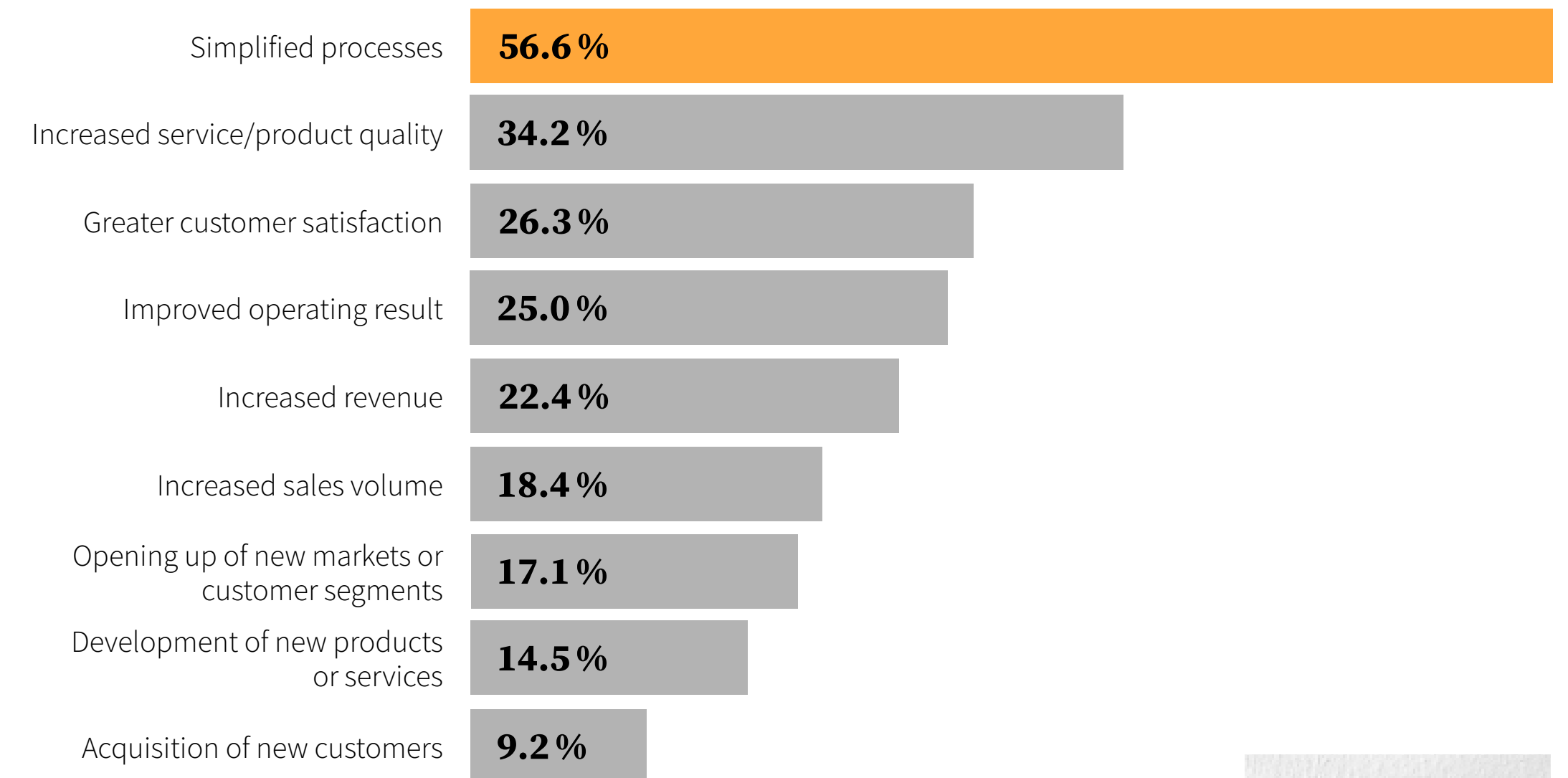


THE OBJECTIVE: TO MAKE EVERYTHING SIMPLER. AND BETTER.

AI applications have already brought about early success in companies. The respondents said that processes in particular have been simplified and the quality of service & products improved, which has resulted in greater customer satisfaction and a better operating result.

What specific benefits have you seen from AI applications so far?

Question only to respondents whose firms are using AI.



The study shows that the huge potential of AI is not yet fully appreciated. Companies are still not thinking far enough ahead when it comes to AI.

AI methods can, for example, be used to identify upcoming trends and predict the opportunities offered by new markets or products. Therefore, instead of just reacting in the “here and now”, companies must become pro-active. This is exactly where the huge potential of artificial intelligence lies.”



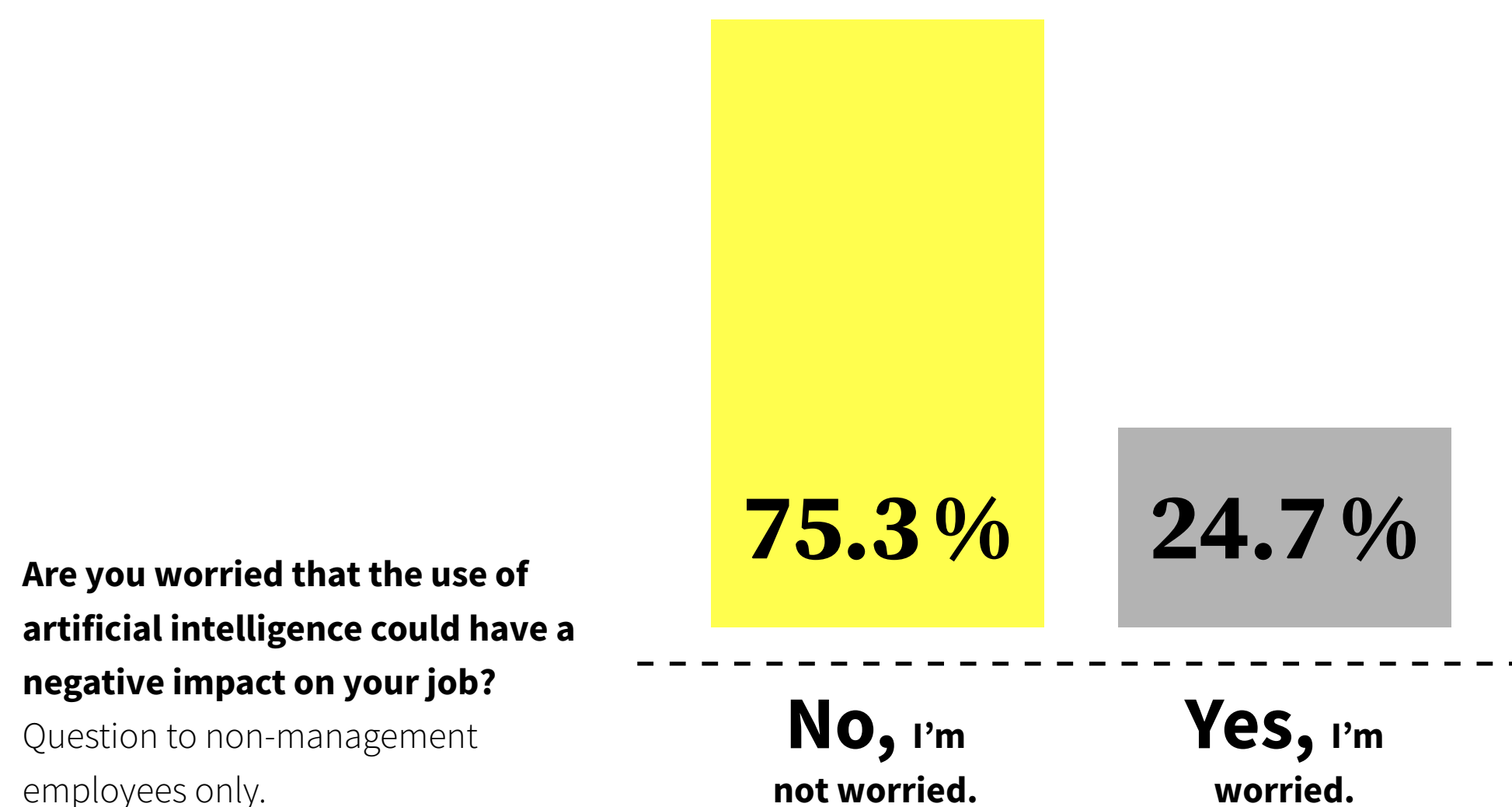
Ellen Rohde
Head of Customer Insights & Research at the IUBH International University

AI – PROBLEM SOLVER NOT JOB KILLER

WORRIES, BENEFITS AND EXPECTATIONS REGARDING THE USE OF AI

In the survey, 75.3% responded positively to the use of AI in their company. They were not worried that AI would have an impact on their jobs. These were primarily in the areas of marketing, finance, service, legal, research and development, production, quality assurance, IT and administration.

Respondents, who saw AI as beneficial, in particular hope for **increased efficiency, relief and faster work as well as various optimisations in everyday work**. 24.7% of those surveyed, however, are worried. Most of those with worries are in HR development, the HR department, sales and logistics. They are primarily worried that the use of AI applications **will lead to job losses or make certain tasks redundant**.



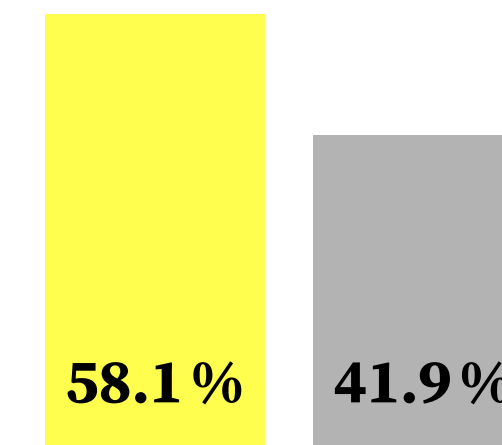
TOO MUCH AI? NO SUCH THING.

The respondents had a generally positive attitude towards the use of AI in their company. **Only 2.9% of the respondents said that too much AI is used in their company.**

Do you think that the use of AI will be beneficial to your company?

Question to non-management employees only.

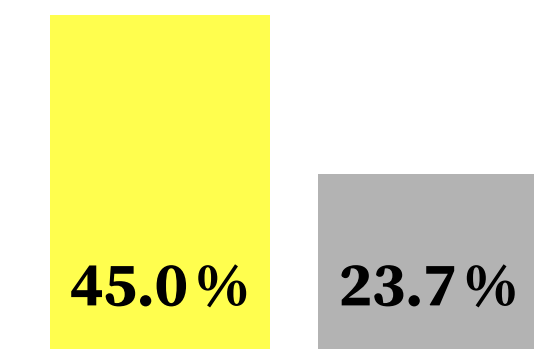
■ Yes ■ No



Is AI used proportionately in your company?

■ Yes, it's just right

■ No, less than required



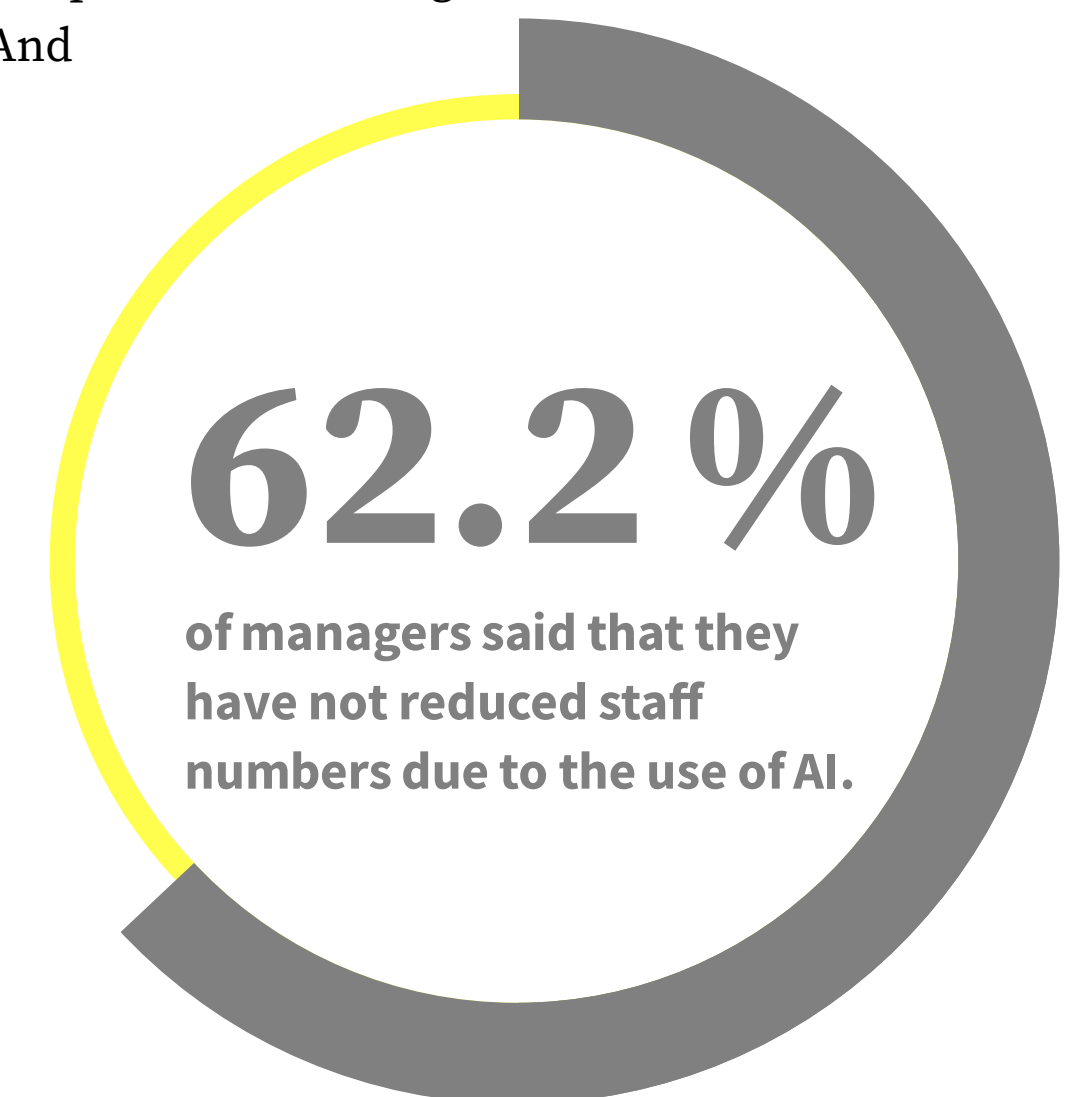
REDUCE STAFF WORKLOAD – INSTEAD OF STAFF NUMBERS.

Reducing staff workload is a major factor in the use of AI applications. 42.1% of the respondents who are currently already using AI see reducing staff workload as one of the main objectives. Also important: Reducing costs – often thanks to improved efficiency. And those who are not yet using AI? More than 52% said that they would like to use AI to reduce staff workload. Reducing costs is only an objective for 47.5% here.

Have you already reduced staff numbers due to AI applications, or do you plan to cut back on staff because of AI applications?

Question only to respondents who (wish to) reduce costs with AI applications, managers only.

■ Yes ■ No



ABOUT THIS STUDY

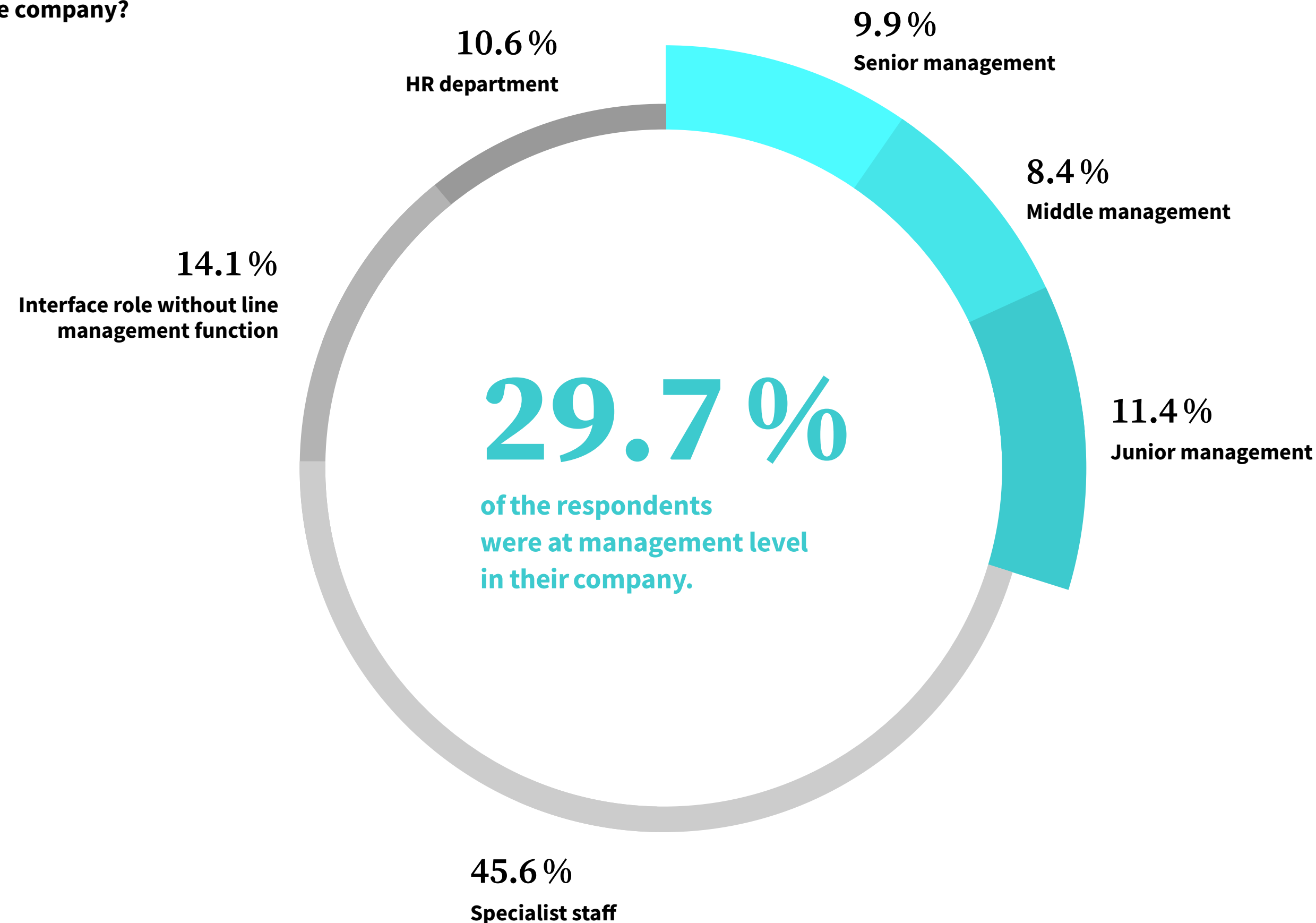
This trend study focused on “**Artificial intelligence in companies**”, **AI for short**. For the study, over 500 employees and managers from companies of different sizes were surveyed anonymously.

In the evaluation, the companies were grouped together into small companies (up to 20 employees > 12.4%), medium-sized companies (21 to 500 employees > 36.2%) and large companies (over 500 employees > 40.3%).

Most of the respondents have over 10 years of professional experience.

Roles were also selected in such a way that there was a good cross section for quantitative survey:

What is your role/function in the company?



Want to get in touch?!

If you have any questions or comments, you can contact us at: research@iubh.de

LEGAL INFORMATION

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You can also find us on:



References:

¹What is Artificial Intelligence 'AI'? – Definition from WhatIs.com
²www.techtag.de – Wo wird künstliche Intelligenz eingesetzt?

Survey period: October 2020.