The Current and Future State of the AI Industry in the Netherlands

The 2023 survey

Created by:

CORE

DIGITAL REALTY.

ai.nl

June 2023

Contents

Executive summary

This white paper presents the results of a survey conducted in the Netherlands in May 2023 by Gcore, Digital Realty, and AI.nl. The survey highlights the current and future state of the Netherlands' artificial intelligence (AI) industry, as well as key trends and challenges in the AI market. The findings are based on interviews with 300 senior IT professionals and decision makers from various business sectors.

Key findings

Familiarity with AI

Overall, 30% of respondents are familiar with, or experts in, AI and its application to their industry. This increases to 47% for those in the software/technology sector. It is also significantly lower for businesses in the early stages of growth at 22%.

AI application awareness and implementation

In terms of specific AI applications, 50% of all respondents are aware of robotics, which is the highest of all AI applications for the respondents as a whole. However, those who consider themselves familiar with or experts in AI are significantly more aware of AI-optimized hardware (59%).

Challenges with AI implementation

Lack of talent and difficulty integrating AI with existing systems (both 24%) are the most common challenges organizations face when implementing AI. Skills, knowledge, and experience in AI solutions is the most important factor when looking for AI partners, according to 35% of businesses.

Key trends within the AI industry

Respondents identify the following technologies as key trends:

- Creative and generative AI: 42%
- AI powered chips: 41%*
- The rise of facial recognition: 41%

Those who consider themselves familiar with or experts in AI are more likely to consider AI-powered chips a key trend (50%.)

The future of AI

When asked how AI will change the way businesses operate in the future, 39% of respondents believe that AI will reduce the time spent on administrative tasks and will enhance employee training opportunities as employees necessarily improve skills required for AI use.

Purpose of the survey and its methodology

The survey looks at the Dutch AI industry to uncover:

- Companies' knowledge and understanding of AI technologies and solutions
- The degree and characteristics of AI implementation
- Challenges of AI
- Key industry trends
- Current and future wants and needs of the AI market

Methodology

We interviewed 300 senior IT experts and decision makers in the Netherlands. Respondents are responsible for selecting, purchasing, and implementing AI IT infrastructure, AI technology, and solutions for their organization. Roles include head of engineering, head of data & AI, chief information officer, director of digital transformation, director of artificial intelligence & data science, and various IT decision makers such as CIO, CISO, CSO, and more. The interviews were conducted online using an email invitation and an online survey.

Respondent demographics summary

Demographics	Total respondents: 300
Business phase	Maturity: **18%** Expansion: **50%** Growth and establishment: **22%**
Role responsibility	Responsible for IT department: **49%** Responsible for finance department: **32%** Responsible for executive leadership: **23%**
Size of company	<table><tr><td># of emloyees</td><td>50-99:</td><td>100-199:</td><td>200-499:</td><td>500+:</td></tr><tr><td>% of respondents</td><td>18%</td><td>25%</td><td>24%</td><td>33%</td></tr></table>
Business sector	Software/technology: **19%** Finance/insurance/accounting: **16%** Healthcare: **10%**

Survey results in detail

Current and future AI applications

1. Familiarity with AI and its potential applications

The increasing amount of research on the benefits of AI has helped raise awareness of the technology's potential. As companies get to know AI better, they are starting to see how it can help them improve operations and profitability.

30% of respondents overall are familiar or experts in AI and its application to their industry; this increases to 47% in the software/technology sector.

30% — expert / familiar

- 25% — Familiar with AI
- 5% — I consider myself an expert in AI
- 20% — Not very familiar with AI
- 50% — Somewhat familiar with AI
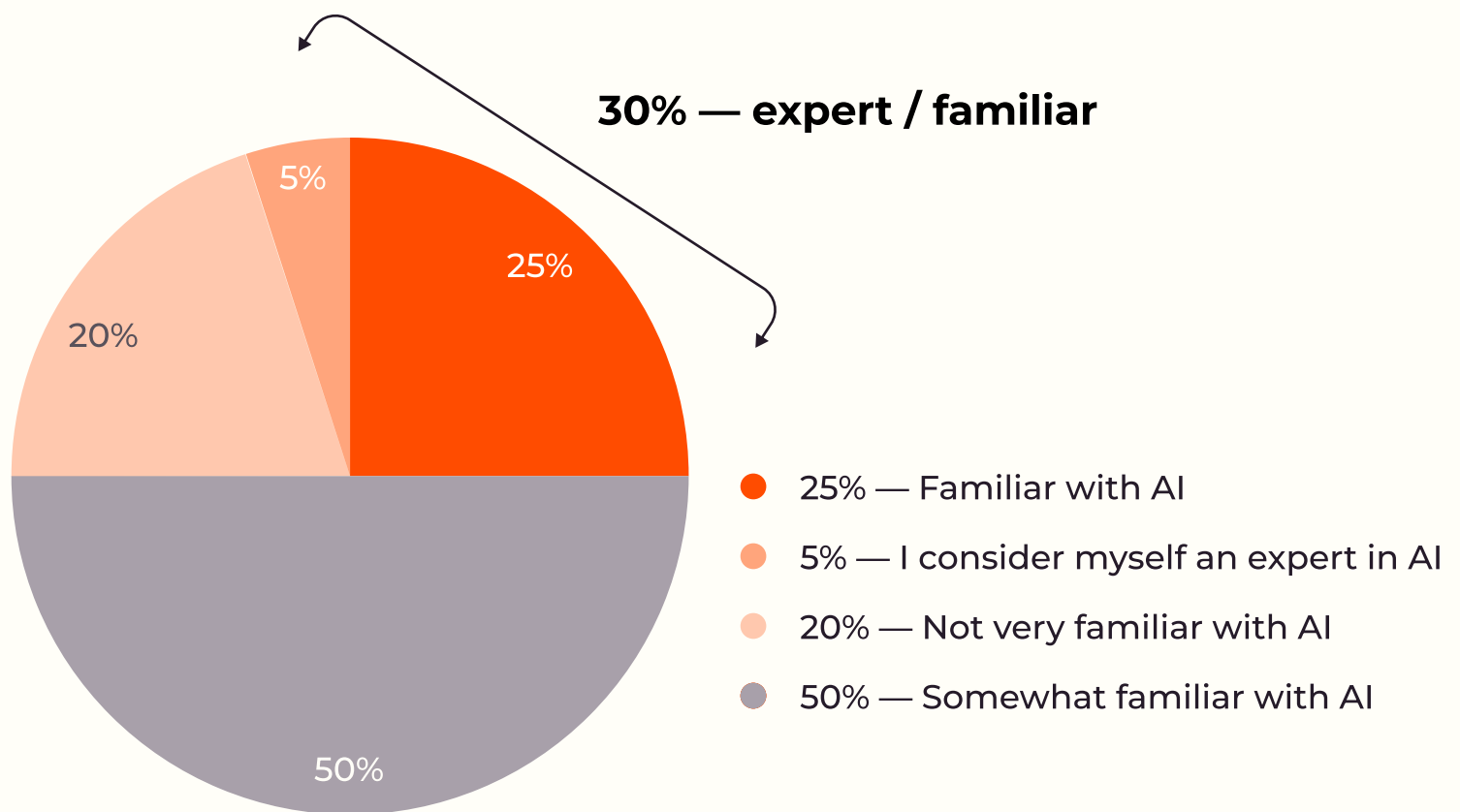
The 30% who are familiar with or experts in AI break down by business phase and sector as follows:

By business phase:
- Early development/growth: 22%
- Expansion: 35%
- Maturity: 32%

By sector:
- Software/technology: 47%
- Finance/Insurance: 39%
- Manufacturing: 23%
- Public services: 15%
- Other: 25%

2. Familiarity with specific AI applications

AI-optimized hardware stands out as exhibiting a significant difference in terms of familiarity. When looking at the overall sample compared to those that are familiar with or experts in AI, there is a high discrepency rate of 24%. When those familiar with or experts in AI who have responsibility for AI within their company are considered, the familiarity rises further to 65%.

● Overall   ● Expert/familiar

Robotics
50%
60%

Speech recognition
49%
55%

Machine Learning (ML)
43%
59%

Deep Learning (DL)
37%
56%

AI-optimized hardware
35%
59%

Virtual agents
34%
42%

Computer vision
33%
47%

Natural Language Processing (NLP)
27%
43%
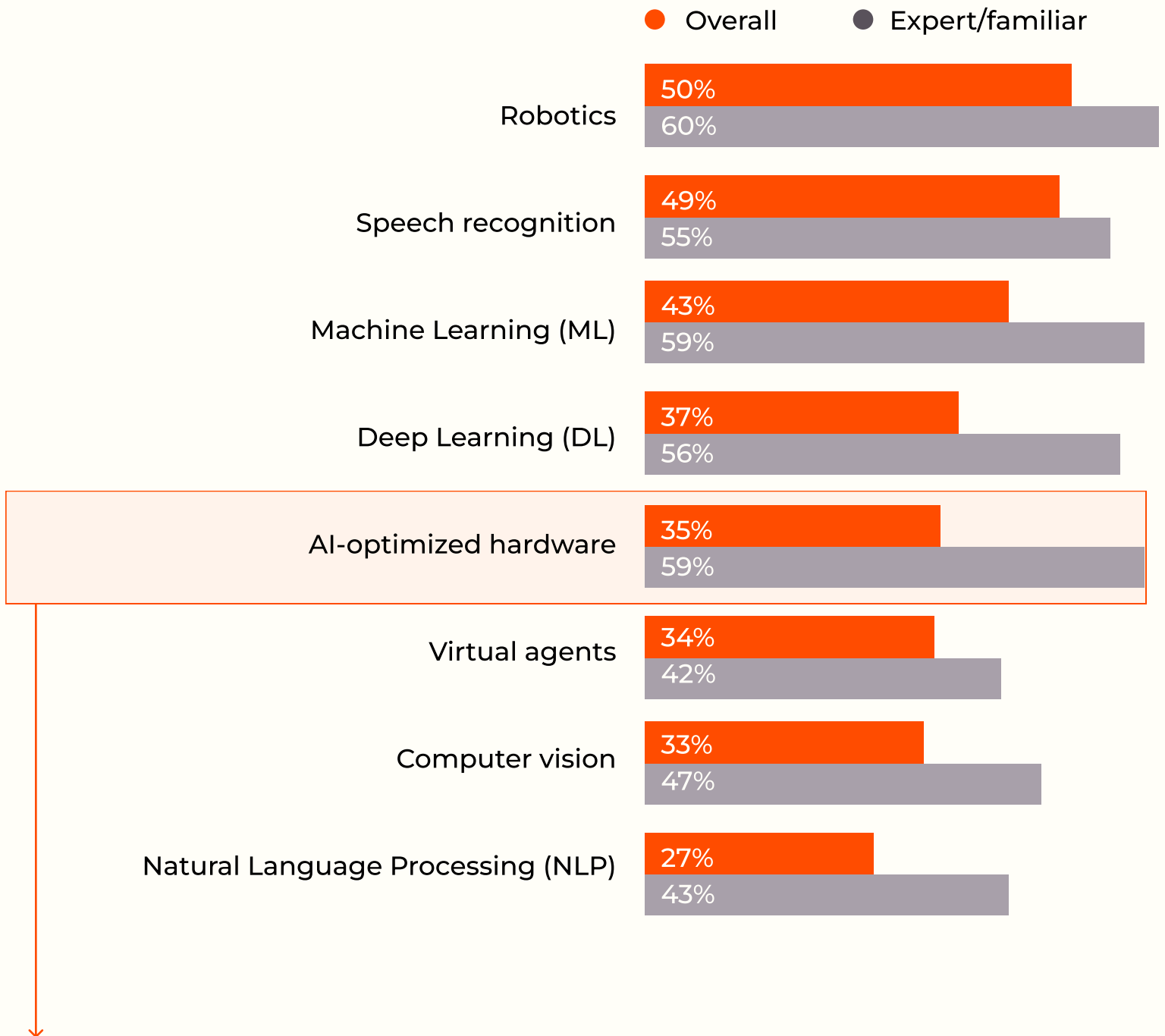
Increases to 65% for those who are familiar or experts in AI and have responsibility for AI within their company

3. State of AI implementation

Nearly two-fifths (39%) of Dutch companies have already invested in AI technologies and/or solutions implementation, and in the finance and software/technology sectors the figure rises to almost half.

Interestingly, nobody chose the "No, and we don't plan to" option. This is evidence that AI is already a crucial part of companies' digital transformation.
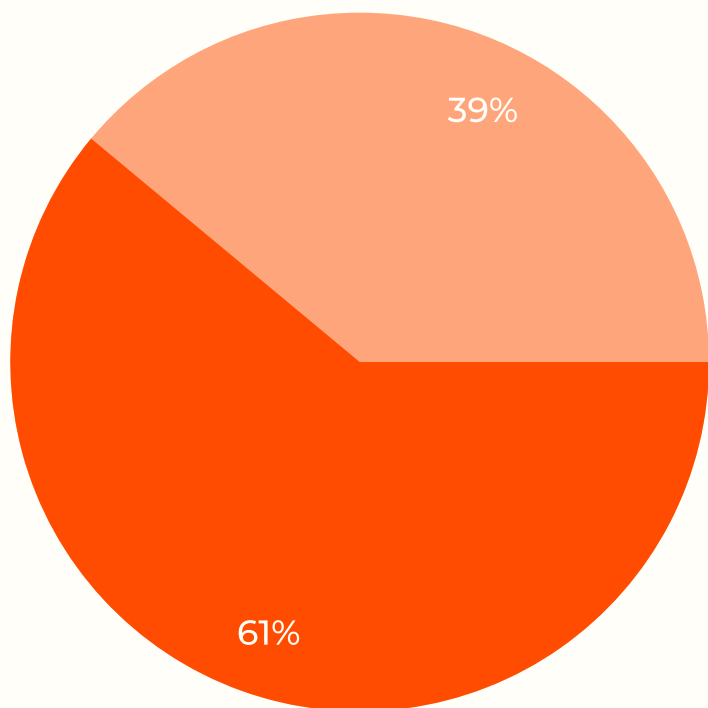
- 61% — No, but we plan to
- 39% — Yes, we already have
- 0% — No, and we don't plan to

Breakdown by business sector of those who have already invested in AI:

- Software/technology: 46%
- Finance/insurance: 48%
- Manufacturing: 30%
- Public services: 29%
- Other: 40%

Remy Gieling, the founder of ai.nl:

"Technology is no longer the limiting factor for building futureproof organizations, it's a leadership challenge. It's up to executives to decide if they will invest enough time and resources to harness the benefits of AI."

4. AI applications using state and its future

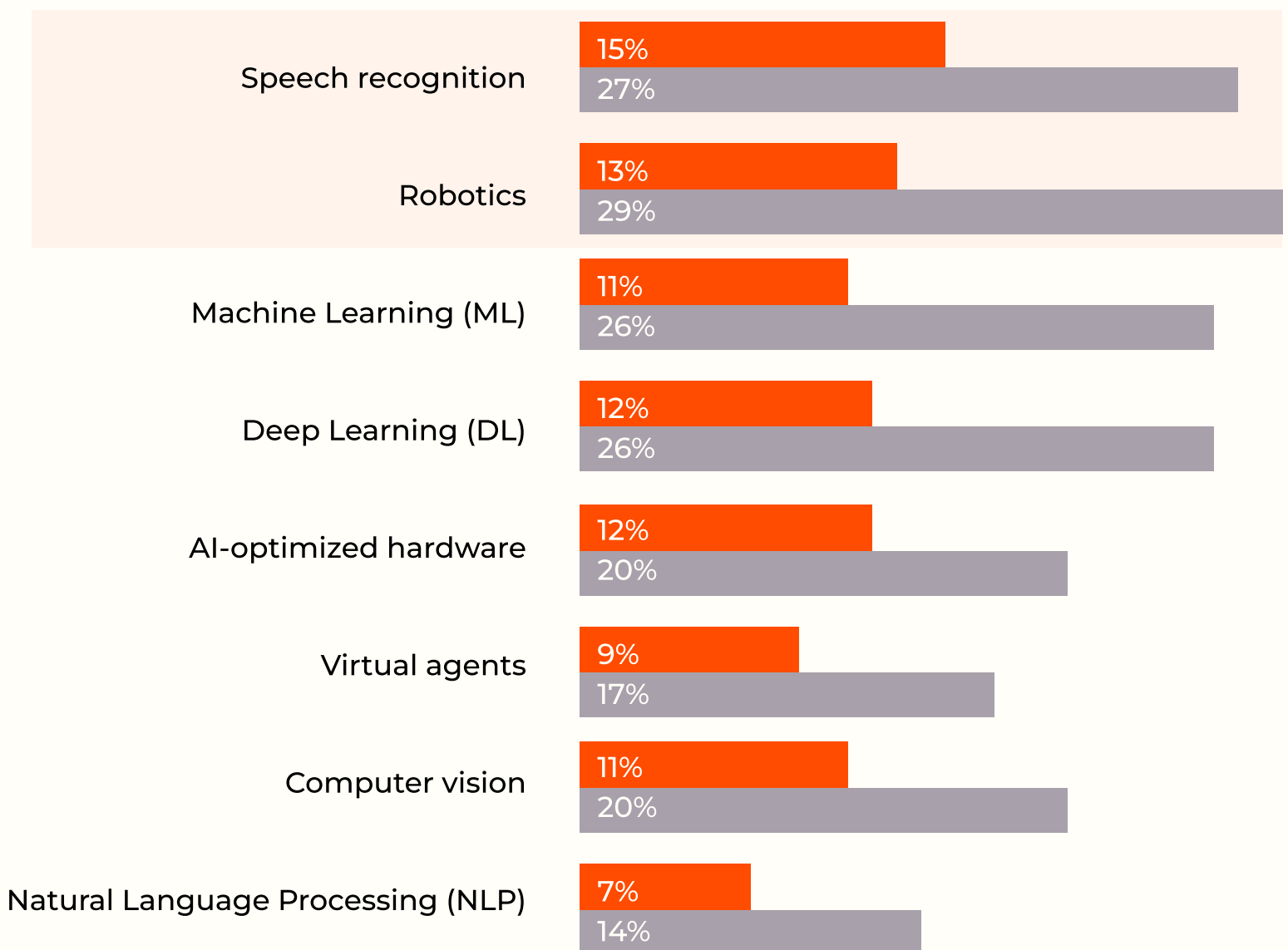Speech recognition and robotics are key AI applications implemented and expected to grow in uptake. No surprise: both are mature technologies with a wide range of potential applications. Speech recognition is used in diverse implementations, including virtual assistants, voice-activated devices, and call centers. Robots are used in manufacturing, healthcare, logistics, and more.

AI-optimized hardware, such as graphics processing units (GPUs) and Intelligence Processing Units (IPUs), is also popular. This type of hardware is designed to accelerate AI workloads. It increases processing power and parallel processing capabilities particularly well suited for running AI algorithms. By using AI-optimized hardware, organizations can significantly speed up AI training and inference tasks, reducing the time required to process complex models and large datasets. (See section 6 below for more details on GPUs and CPUs usage.)

🔴 **Currently using / implementing**

⚫ **Planning to use**

	Currently using / implementing	Planning to use
Speech recognition	15%	27%
Robotics	13%	29%
Machine Learning (ML)	11%	26%
Deep Learning (DL)	12%	26%
AI-optimized hardware	12%	20%
Virtual agents	9%	17%
Computer vision	11%	20%
Natural Language Processing (NLP)	7%	14%

Leading AI implementations in detail

Speech recognition:

- Google Assistant: 65%
- Apple Siri: 41%
- Google Cloud Text-to-Speech: 39%

Robotics:

- Robot Operating System: 36%
- Universal Robots: 36%
- TensorFlow: 31%

AI-optimized hardware:

- Cloud-based AI-optimized hardware: 53%
- Intelligence Processing Units: 47%
- Central Processing Units: 42%

5. Graph neural networks and ML/DL using state

Graph neural networks (GNNs) are a type of machine learning algorithm used to analyze and process data, which is then represented as a graph. A graph in this context is a data structure consisting of entities, such as people, places, or products, and the relationships between these entities. GNNs are useful for solving many different business problems and applying in use cases including recommendation systems, risk assessment, and fraud detection.

We asked respondents who already use machine learning/deep learning if they use GNNs in their business. More than half of our respondents (58%) already do.
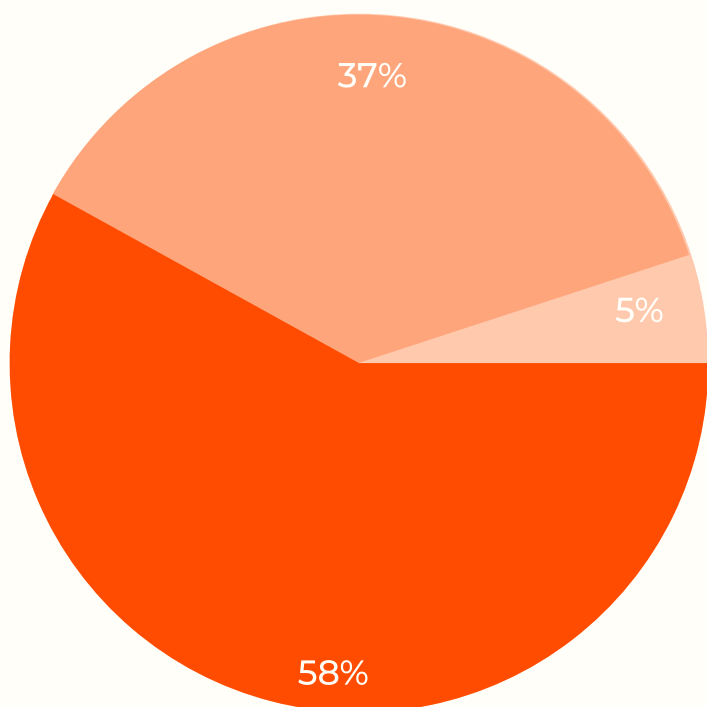
- 58% — Yes
- 37% — No
- 5% — Don't know

ML/DL implementations in detail

Machine learning solutions:

- Microsoft Azure Machine: 68%
- TensorFlow: 24%
- Amazon SageMaker: 24%

Deep learning solutions:

- Microsoft Cognitive Toolkit: 69%
- MXNet: 28%
- Torch: 28%

6. IPU and GPU using state

Graphics processing units, or GPUs, are processors designed for parallel computing, which means they can handle many tasks at once. This makes them perfect for AI-related tasks that require vast quantities of data, such as machine learning and data analytics.

Intelligence Processing Units, or IPUs, are a type of processor made specifically for ML and AI tasks. They can process data much faster than CPUs and GPUs.

We asked respondents why they don't use IPUs and GPUs. For both IPU and GPU, costs are important factors. Two reasons gained 30% each when it comes to why they don't use IPUs: because their IT team is unfamiliar with operating IPU solutions, and because their current solutions work well.

"Why don't you use an IPU?"

IT is not familiar with operating IPU solutions	30%
Current solutions work well	30%
Cost	28%
Unaware of the benefits	23%
Software is not able or designed to use IPUs	20%
Don't feel the need for our organisation	14%

"Why don't you use GPUs?"

Software license costs	35%
Hardware costs	31%
IT is not yet familiar with operating GPU solutions	31%
Energy/power restrictions	26%
Software is not able or designed to use GPUs	19%
Other	1%

7. Business areas on which AI projects are focused

Current AI projects are primarily focused on IT (42%.) AI helps to automate tasks such as security monitoring, network troubleshooting, and software development. Organizations use AI to improve IT security, reduce IT costs, and increase IT agility.

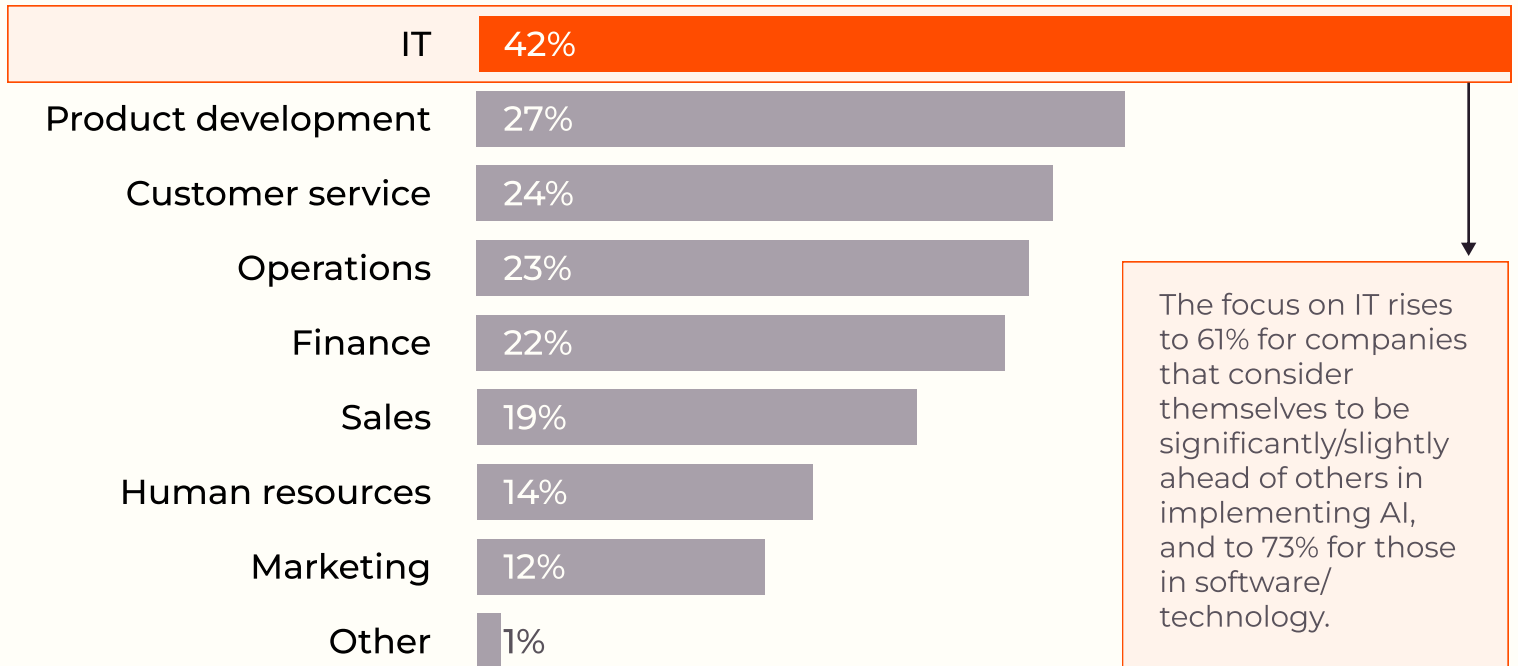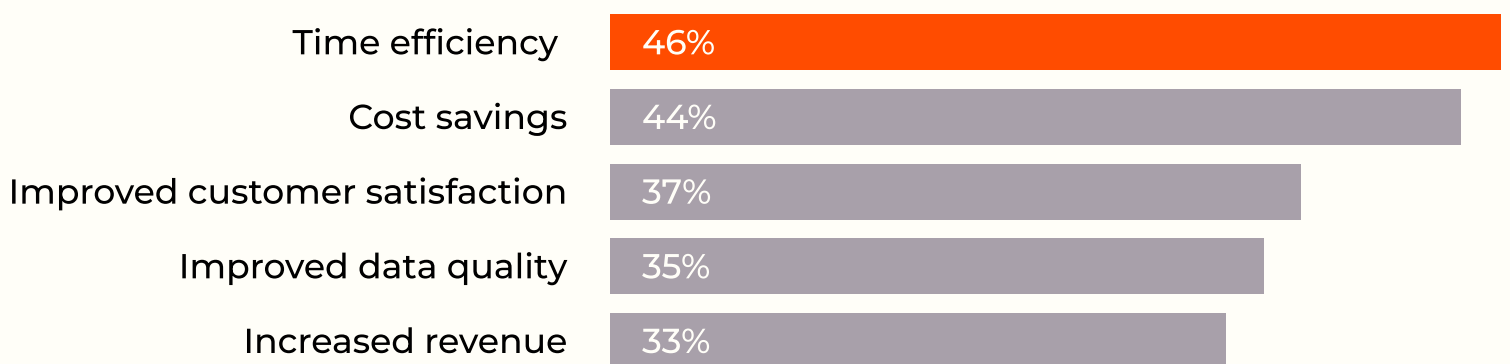| Business area	Percentage
IT	42%
Product development	27%
Customer service	24%
Operations	23%
Finance	22%
Sales	19%
Human resources	14%
Marketing	12%
Other	1%

The focus on IT rises to 61% for companies that consider themselves to be significantly/slightly ahead of others in implementing AI, and to 73% for those in software/ technology.

8. Key metrics of successful AI implementation

Organizations need to measure the success of their AI projects to improve AI models, make better business decisions, and stay ahead of the competition. The specific metrics depend on the specific goals of the AI project. For example, if a company is using AI to improve customer service, one useful metrics might be the number of customers who give positive feedback about the AI-powered service, meaning they are satisfied with it.

In our survey, nearly half of respondents use/would use time efficiency to measure the success of AI. This is higher (53%) among companies with more than 500 employees.
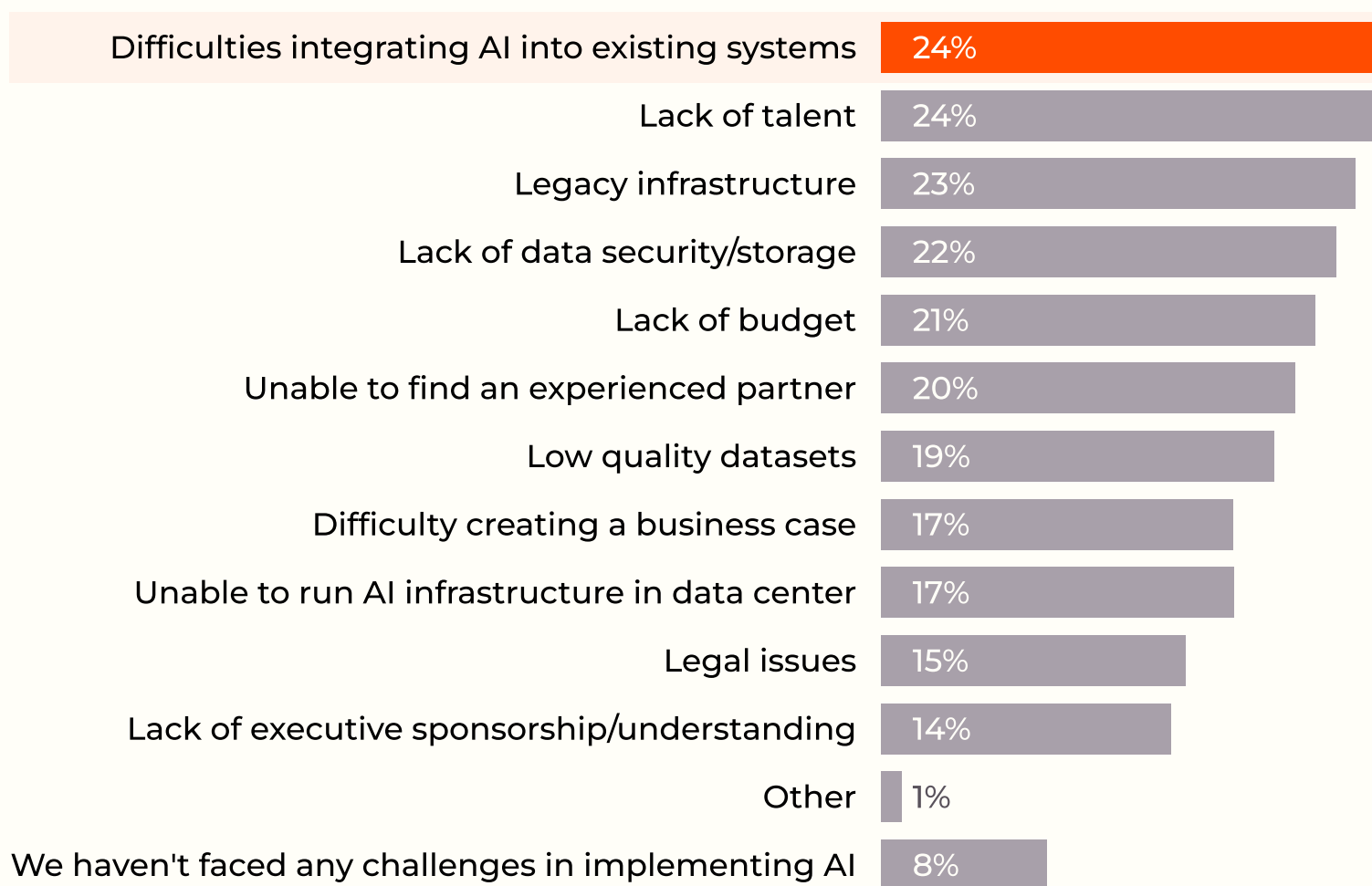
Metric	Percentage
Time efficiency	46%
Cost savings	44%
Improved customer satisfaction	37%
Improved data quality	35%
Increased revenue	33%

Challenges with AI

1. Most common challenges organizations face when implementing AI

Like any complex technology, AI requires technical skills first and foremost. If an organization does not have the expertise to implement AI or a qualified partner, it can be difficult to get started. The survey results confirm this: a lack of talent and difficulty integrating AI into existing systems are the most common challenges companies surveyed face when implementing AI.

This data is based on responses from those who have already invested in implementing AI.

Challenge	%
Difficulties integrating AI into existing systems	24%
Lack of talent	24%
Legacy infrastructure	23%
Lack of data security/storage	22%
Lack of budget	21%
Unable to find an experienced partner	20%
Low quality datasets	19%
Difficulty creating a business case	17%
Unable to run AI infrastructure in data center	17%
Legal issues	15%
Lack of executive sponsorship/understanding	14%
Other	1%
We haven't faced any challenges in implementing AI	8%

2. Specific constraints that companies face/anticipate when running AI on-premises

The decision to run AI on-premises or in the cloud depends on the specific needs of the organization. While both methods offer comparable performance capabilities, each has its own advantages. If cost efficiency, scalability, and flexibility are preferable, running AI in the cloud may be a better option. If control and security are key concerns, running AI on-premises makes sense.

Running AI in an on-premises data center can cause organizations to face technical limitations:

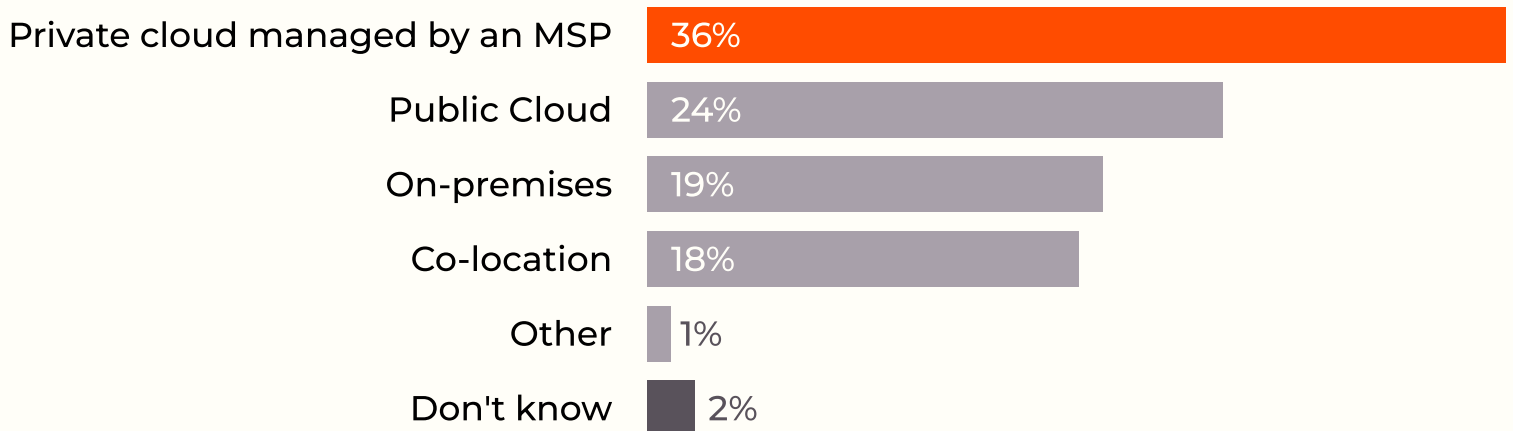|	
Lack of data centre space	50%
Electrical power consumption	31%
Cabinet weight issues	27%
Cooling issues	27%
Other	8%
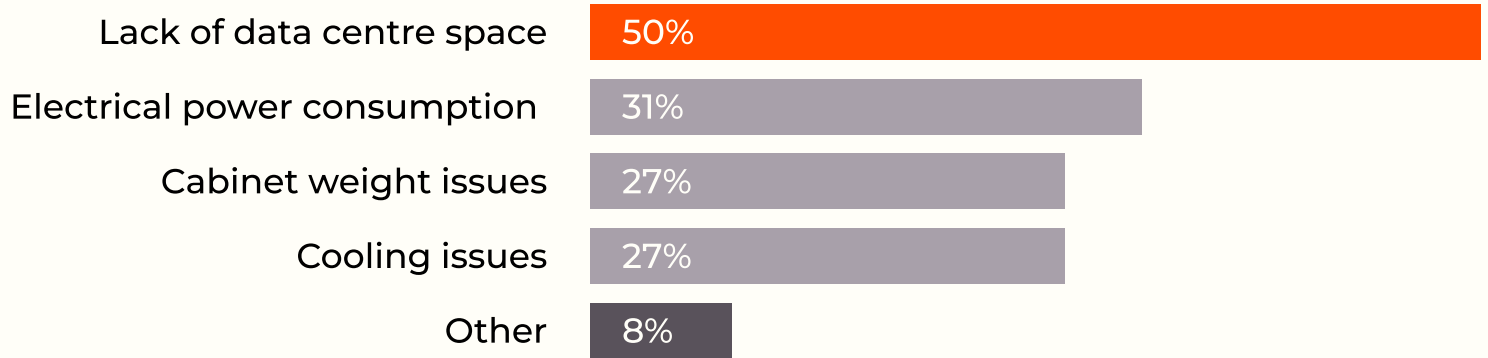
3. Ways to run AI workloads

More than half of respondents (60%) run, or plan to run, their AI workloads in the cloud, and a more than one-third with help of a managed service provider (MSP).

There are several reasons for this:

- Running AI workloads in the cloud offers virtually unlimited scalability, collaboration, and cost savings.
- Some cloud providers offer pre-built AI services such as computer vision, natural language processing, and IPUs.
- Providers also often have the entire ecosystem of tools, frameworks, and integrations to support AI development and deployment. These services and tools can be easily integrated into AI applications.

Private cloud managed by an MSP	36%
Public Cloud	24%
On-premises	19%
Co-location	18%
Other	1%
Don't know	2%

Andre Reitenbach, CEO and co-founder of Gcore:

"The survey highlighted an intriguing trend in the AI landscape. While many companies are actively training their AI models on-premises or at data centers, the need to deploy these models on the edge has become increasingly crucial. At Gcore, we recognize this need and are dedicated to providing innovative solutions that enable the seamless deployment of AI models on the edge. By leveraging our expertise and cutting-edge technology, we empower businesses to unlock the full potential of AI at the edge, driving efficiency, real-time decision-making, and unlocking new possibilities for growth and transformation."

4. The most important characteristics of an AI solutions partner

More than one-third of companies agree that skills, knowledge, and experience are the most important qualities when looking for an AI solutions partner. This is related to the fact that respondents cite a lack of talent and difficulty integrating AI as the most common challenges.

Business phase	%
Growth and establishment	42%
Expansion	33%
Maturity	32%

Characteristic	%
Skills, knowledge and experience in AI solutions	35%
Easy integration	26%
Proven results metrics	26%
Customer support throughout implementation and beyond	23%
Free trials before purchase	21%
Fast time to market	21%
Digital sovereignty	18%

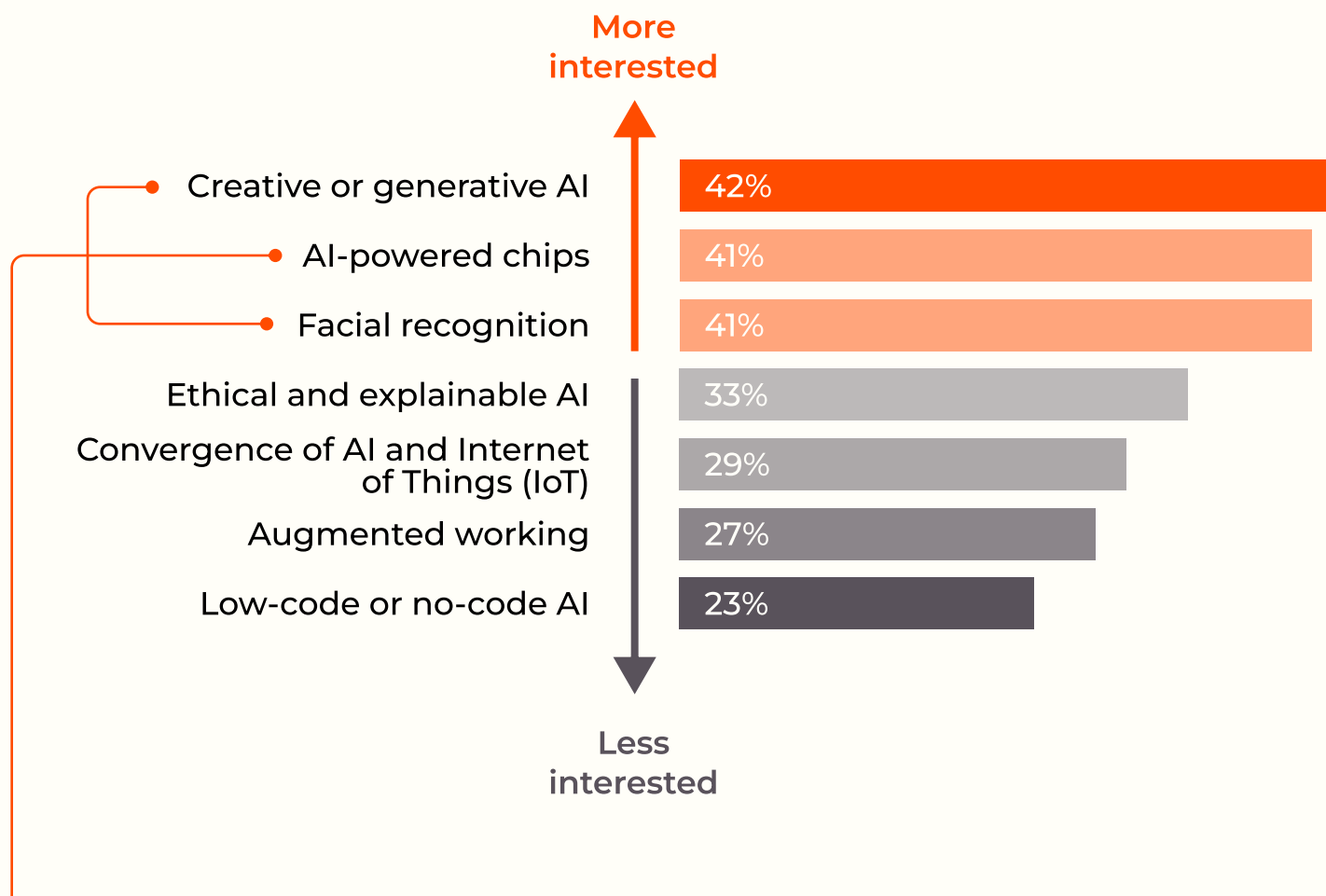| Familiarity with AI	%
Familiar / expert	24%
Somewhat familiar	16%
Not very familiar	12%

Enrico de Boer, Director at Digital Realty:

"The application of AI is not a matter of whether you will consider it, but when. When you come to apply AI, make sure your AI solution uses a location which can fully support an AI environment: highly secured, highly connected, and expertly operated."

Industry trends

Creative and generative AI, AI-powered chips, and facial recognition are seen as key trends in the AI industry.
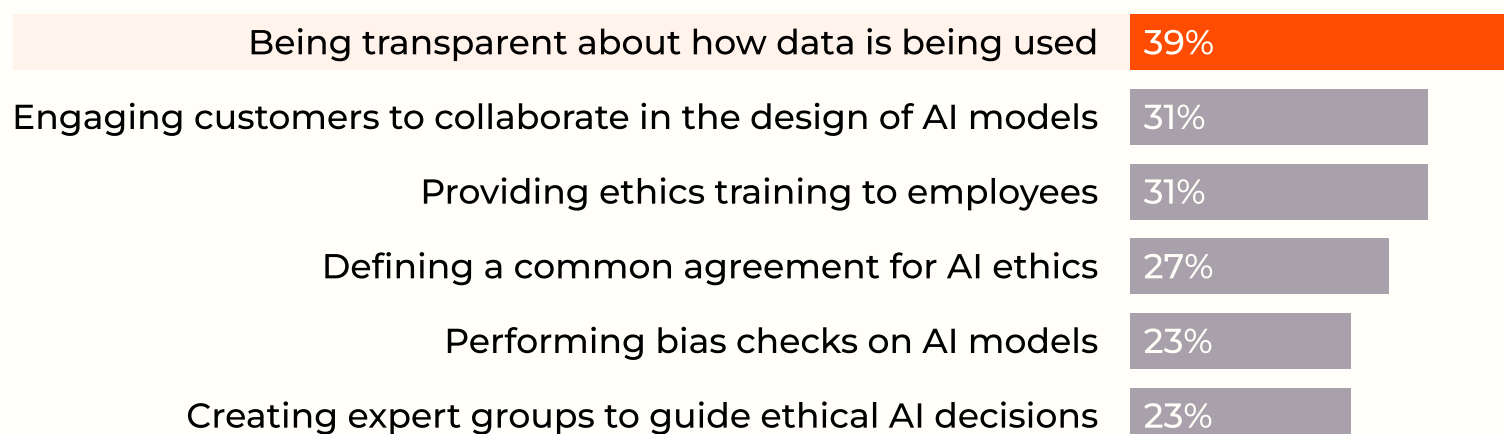
More interested

Creative or generative AI	42%
AI-powered chips	41%
Facial recognition	41%
Ethical and explainable AI	33%
Convergence of AI and Internet of Things (IoT)	29%
Augmented working	27%
Low-code or no-code AI	23%

Less interested

Generative AI is a type of AI that creates new data, such as images, text, or music.

AI-powered chips are specialized processors designed to speed up the processing of AI workloads.

Facial recognition is a technology that can recognize and identify individuals based on their facial features.

Ethics and privacy

1. How the respondents ensure/plan to ensure the ethical use of AI in their organization
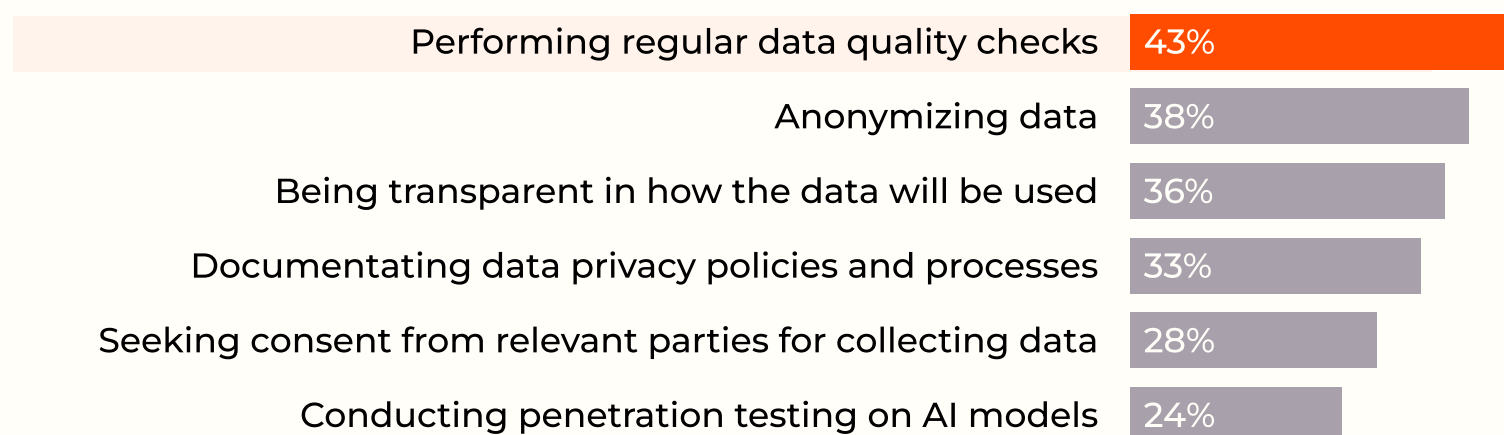
Ensuring the ethical use of AI in business is important because it helps to protect people's rights and privacy, and prevents bias and discrimination. It also builds trust with individuals, so that they are willing to use AI systems and share their data with them. This explains why transparency in data use is at the top of all responses to the question of how organizations will ensure ethical AI use.

Being transparent about how data is being used	39%
Engaging customers to collaborate in the design of AI models	31%
Providing ethics training to employees	31%
Defining a common agreement for AI ethics	27%
Performing bias checks on AI models	23%
Creating expert groups to guide ethical AI decisions	23%

2. How the respondents ensure/will ensure privacy and security when it comes to AI

AI systems can collect and store significant amounts of personal data. This data can be used to make decisions about individuals, such as determining loan eligibility, insurance approval, and job offers. If personal data is not secured, a malicious actor can steal it and use it for unlawful and/or unethical purposes.

We asked respondents how they do/would ensure that privacy and security are maintained when using AI systems. Regular data quality checks are seen as the most effective method.
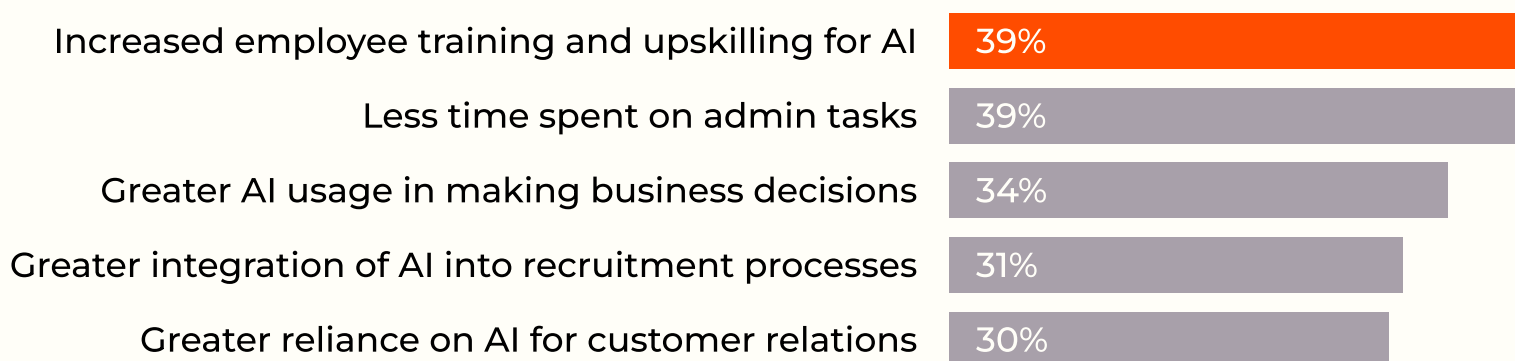
Performing regular data quality checks	43%
Anonymizing data	38%
Being transparent in how the data will be used	36%
Documenting data privacy policies and processes	33%
Seeking consent from relevant parties for collecting data	28%
Conducting penetration testing on AI models	24%

Future of AI

1. How AI will change the way businesses operate in the future

The potential for AI to transform the way businesses operate is immense. AI can help businesses become more efficient, effective, and competitive by automating tasks, improving decision making, personalizing experiences, enhancing security, and creating new products and services.

The majority of our respondents believe that AI will reduce the time spent on administrative tasks and will enhance employee training while improving AI-specific skills.
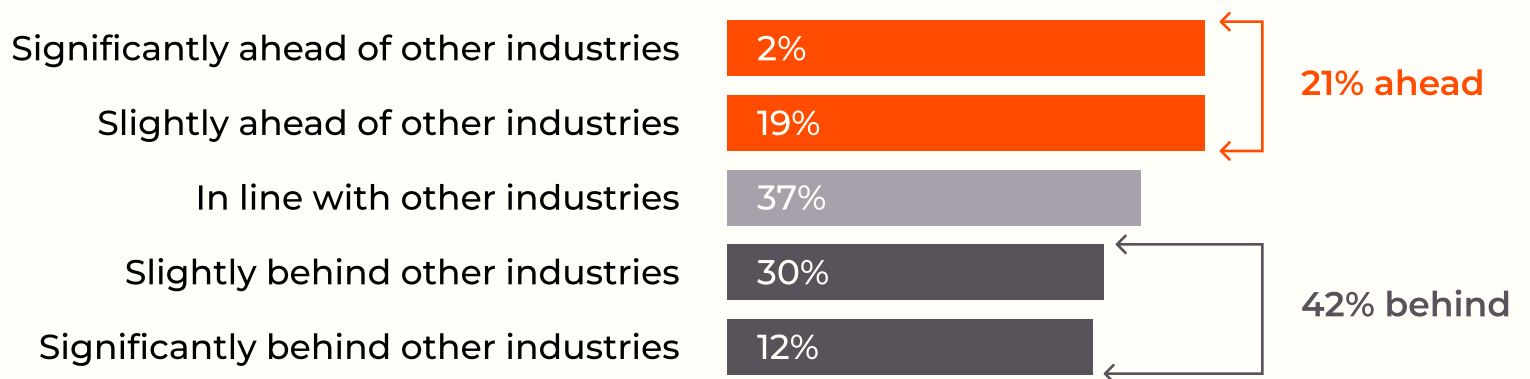
Increased employee training and upskilling for AI	39%
Less time spent on admin tasks	39%
Greater AI usage in making business decisions	34%
Greater integration of AI into recruitment processes	31%
Greater reliance on AI for customer relations	30%

Remy Gieling, the founder of ai.nl:

"In an AI-driven economy, every organization needs to reinvent every process to automate or augments tasks using intelligent software."

2. Where the respondents think their industry stands in the way in AI adoption

Industries such as technology, finance, logistics, e-commerce, manufacturing, and healthcare are at the forefront of AI adoption. They recognize its potential to drive innovation, improve efficiency, and enhance the customer experience. Some industries, such as agriculture and construction, are lagging behind in AI adoption for reasons including investment costs, regulatory challenges, and a lack of skilled employees.

According to the survey results, only 21% of our respondents say they are ahead of other industries in terms of AI adoption, while 38% believe their business is in line with others' and 42% believe they are behind.

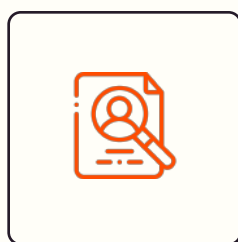|		
Significantly ahead of other industries	2%	
Slightly ahead of other industries	19%	21% ahead
In line with other industries	37%	
Slightly behind other industries	30%	42% behind
Significantly behind other industries	12%	

3. Key factors that make a business an industry leader in AI adoption

We asked respondents what they thought made their business an industry leader in AI adoption. Here are the top five reasons they gave.

Testing and research	Hiring talent	Profit and budget	Long-term vision	Organization and speed

Takeaways

Positive indicators

The survey shows that the AI implementation in the Netherlands is at a decent level. More than one-third (39%) of companies are already using solutions such as AI-optimized hardware, robotics, and speech recognition, while others are planning to use them. Of those who have already implemented machine learning/deep learning, more than half (58%) are using graph neural networks. Companies are also trying to keep up with industry trends such as AI-powered chips and generative AI.

Points of growth

At the same time, the AI industry in the Netherlands has room to grow. A substantial 42% of organizations believe they are lagging behind others in terms of AI adoption. We also found that some respondents don't use certain technologies simply because they are unfamiliar with them and their benefits. For example, 30% of companies don't use IPUs because their IT teams are not familiar with the solution.

Key statistics

- 30% are familiar with or experts in AI and its applications to their industry.
- 42% are planning to or currently using speech recognition and robotics, and 32% are planning to or currently using AI-optimizied hardware.
- More than 40% see creative and generative AI, AI-powered chips, and the rise of facial recognition as the key trends in the AI industry.
- 35% of respondents agree that skills, knowledge, and experience in AI solutions are most important when looking for an AI solutions partner.
- 21% believe they are ahead of other industries when it comes to AI.

Andre Reitenbach, CEO and co-founder of Gcore:

"At Gcore, we believe in the transformative power of AI and its potential to shape the future of industries. The survey results not only highlight the growing importance of AI but also shed light on the opportunities and challenges that lie ahead. This comprehensive study reaffirms our commitment to innovation and drives us to further develop cutting-edge solutions that harness the true potential of AI."

Recommendations

Stay on top of AI industry trends

Of our respondents, 20% are not very familiar with AI and 51% are somewhat familiar. This means that the vast majority are likely unsure about the potential benefits of AI for their business. Staying informed and educated about the latest developments in AI can help you see how it could benefit your business. It is important to keep up to date with new use cases related to AI implementations in your industry—this can serve as a starting point for a successful project of your own.

Follow the leaders

AI implementation varies across industries and organizations. The pace of this process depends on factors such as organizational readiness, available resources, regulatory considerations, and the specific use cases relevant to the industry. If there are no objective factors preventing you from implementing AI, consider what makes successful AI adopters leaders in this field and try to adopt best practices for you.

Here are features that make surveyed companies AI leaders in their industry:

- Testing new AI applications
- Hiring talent
- Having a long-term vision
- Responding quickly as an organization to new AI developments
- Using AI to increase profitability

Find a partner

Following the leaders doesn't mean you have to do everything yourself. For example, you can acquire capabilities such as technical talent and infrastructure for testing and deploying AI applications from a partner—such as a cloud provider. In this case, a partner can offer pre-built AI solutions like IPUs, GPUs, and machine learning. You can integrate them into your applications without having to build an AI infrastructure from scratch.

When selecting a partner:

- Make sure they have the relevant expertise, resources, and experience.
- Verify that they have the tools and resources to scale your AI workloads and update your applications when you need them.
- Find out if you have the capacity to pay for the resources you are renting.

Enrico de Boer, Director at Digital Realty:

"To become a cognitive enterprise, you need to master cloud and AI."

About the survey creators

Gcore is an international leader in public cloud and edge computing, content delivery, AI, hosting, and security solutions. Gcore is headquartered in Luxembourg and has offices in Germany, Poland, Lithuania, Cyprus, Georgia, and South Korea. It provides infrastructure to global leaders in an array of industries, including the Government of the Grand Duchy of Luxembourg (Agence eSanté), TEDx, Wargaming, Sandbox Interactive, and Avast. The company has been awarded 25+ industry-leading accreditations. Gcore manages its own global IT infrastructure across six continents, with one of the best network performances in Europe, North America, Asia, and LATAM, according to the independent analytical services provider, Cedexis (a Citrix company.)

info@gcore.com

Digital Realty brings companies and data together by delivering the full spectrum of data center, colocation and interconnection solutions. PlatformDIGITAL®, the company's global data center platform, provides customers with a secure data meeting place and a proven Pervasive Datacenter Architecture (PDx™) solution methodology for powering innovation and efficiently managing Data Gravity challenges. Digital Realty gives its customers access to the connected data communities that matter to them with a global data center footprint of 300+ facilities in 50+ metros across 28 countries on six continents.

salesnl@digitalrealty.com

Ai.nl is one of the leading AI boutique consulting firms in the Netherlands helping business leaders to make impact using data and AI. Through inspirational keynotes, strategic workshops / masterclasses and hands-on advice the team is helping organizations to transform urgent business issues into practical AI solutions. By sharing knowledge and building a culture for innovation, ai.nl helps to scale AI initiatives and accelerate adoption.

patrick.brocker@ai.nl

Looking for an expert partner to help you implement AI solutions?

Gcore's **IPU-based AI cloud** is designed to help businesses across various fields. It is built to support every stage of their AI adoption journey, from creating proof of concept to training and deployment.

Get in touch