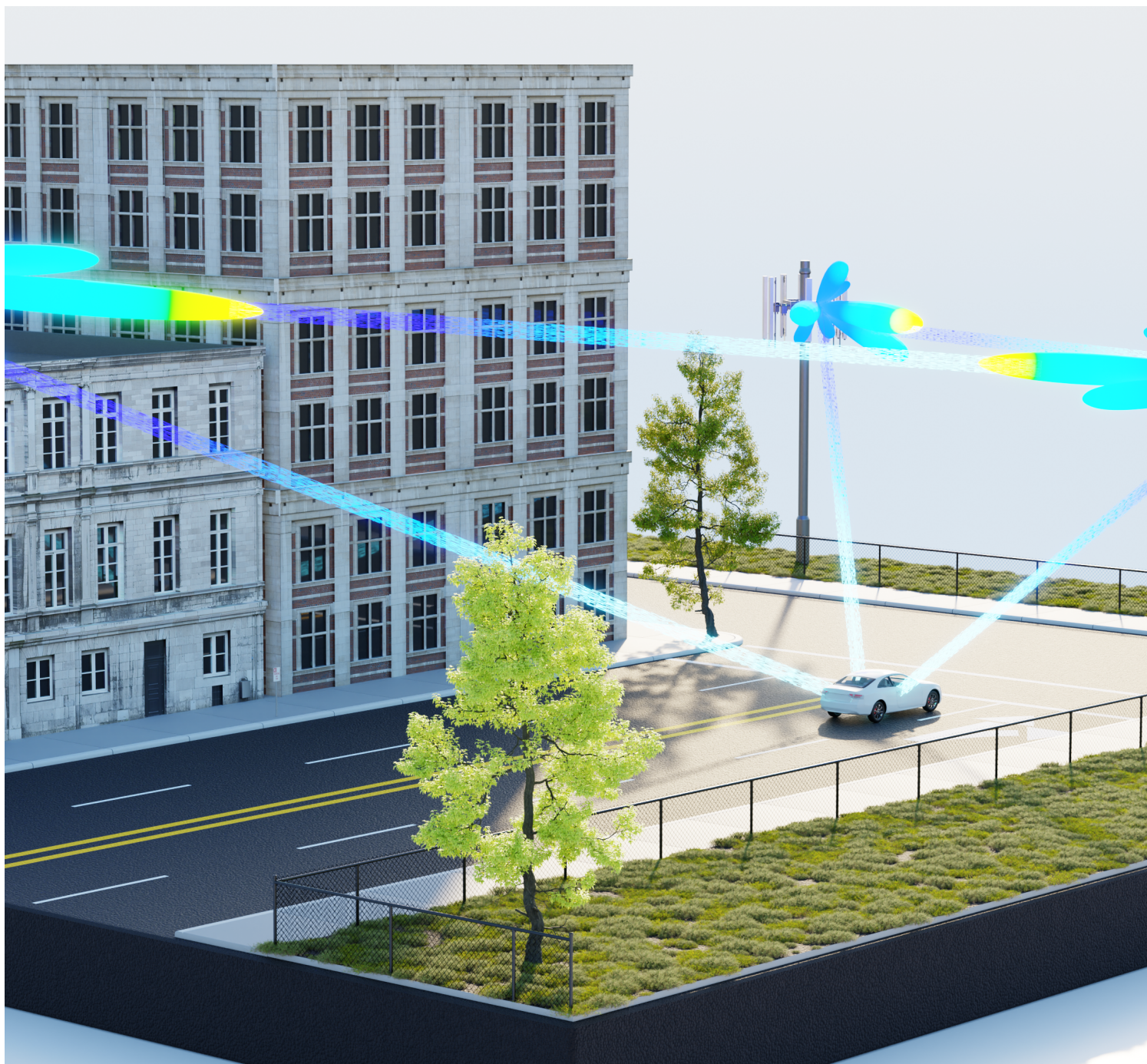


# State of AI in Telecommunications: 2024 Trends



# A Look Inside AI Trends in Telecommunications

The role of artificial intelligence in the telecommunications industry is growing, especially with the emergence of **generative AI**. The industry is embracing AI to improve customer experiences, automate processes, increase productivity, and refine network operations. For the second edition of this *State of AI in Telecommunications* report, NVIDIA surveyed 400+ telecom professionals around the world on their views about the opportunities and challenges of implementing AI across their company and in the industry.

This report highlights key survey insights that define the state of AI in telecommunications in 2024. It shows that AI adoption, especially generative AI, is growing, with a notable increase in AI enthusiasm at the executive level. In addition, compared to last year's report, there's better clarity on the role of AI in the industry, the number of AI use cases is increasing, and the return on investment (ROI) from AI is better understood. Finally, while investment into AI is growing, the industry is still in the early phase of the AI investment cycle.

## Perspectives From the Field

This report focuses on the views of telecom industry professionals who are tasked with implementing and delivering AI, including generative AI, in the field. It captures key insights from the survey, conducted between October and December 2023, which asked 400+ respondents to quantify the opportunities and challenges of adopting AI across their business. It includes insights on how the industry is approaching AI and the role of partners in implementing AI solutions in the telecom industry.

Survey respondents represented a mix of telcos (including mobile, fixed, and cable companies) and their hardware and software suppliers. The respondents represented a broad mix of different groups, like customer service, marketing, and business development, and the results include feedback from manager-level industry professionals, including senior executives.

## Top Key Insights on AI in Telecommunications

### Opportunities and Challenges

- > Expectations of success from AI continue to trend upwards.
- > The telecom industry has embraced the generative AI wave.
- > Enhancing customer experiences is the biggest opportunity.
- > AI is improving both revenues and cost savings.
- > Skill shortage is a major challenge to adopting and implementing AI

### Investments in AI

- > AI investment is growing but remains low.
- > Customer experiences are attracting the highest AI investment.
- > Scaling from pilot to implementation is the top driver for AI investments.

## Implementation Approaches

- > Hybrid hosting for AI is preferred but cloud hosting is growing.
- > Partnerships remain critical for adoption of AI solutions in the industry.

## Opportunities and Challenges

### Expectations of Success From AI Continue to Trend Upwards

There's sustained interest in adopting AI and growing expectations of success from AI, especially among industry executives. In the 2023 survey, 90 percent of respondents reported they were currently engaged with AI, either at the assessment/pilot stage or at the implementation/using stage. This level of sustained engagement shows that AI is successfully permeating into many parts of the telecom value chain.

### Currently, at which level is your company using AI in 2023?

Not using	<b>10%</b>
Assessing/piloting	<b>48%</b>
Implementing/using	<b>41%</b>

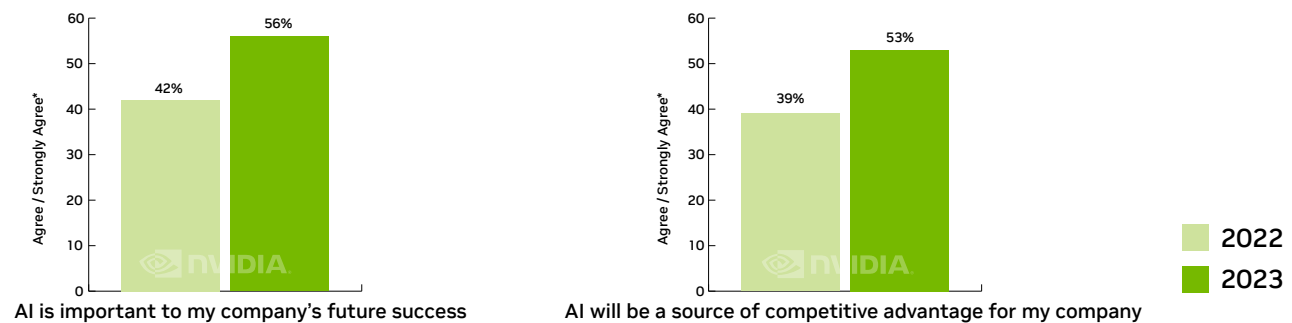
**56%** of respondents agreed that AI is important to their company's success.

The primary reason for this sustained engagement is because many industry stakeholders expect AI to contribute to their company's success. Overall, 56 percent of respondents agreed or strongly agreed that "AI is important to my company's future success," with the figure rising to 61 percent among decision-making management respondents. This figure is a 14-point boost over the 42 percent result from the 2022 survey.

Improving engagement reflects a conviction that AI will enable those who adopt it to gain a competitive advantage in the market. This matters in the highly competitive telecommunications industry. In the 2023 survey, 53 percent of respondents agreed or strongly agreed that adopting AI will be a source of competitive advantage, compared to 39 percent who reported the same in 2022. For management respondents, the figure was 56 percent.

But not everyone agrees about the importance of AI in the industry. The number of respondents who disagree point to the need for more work by all stakeholders to demonstrate how AI is addressing real-world business problems in the industry.

### Interests and Expectations From AI



\*Agree / Strongly Agree are the top two points on a 7-point scale



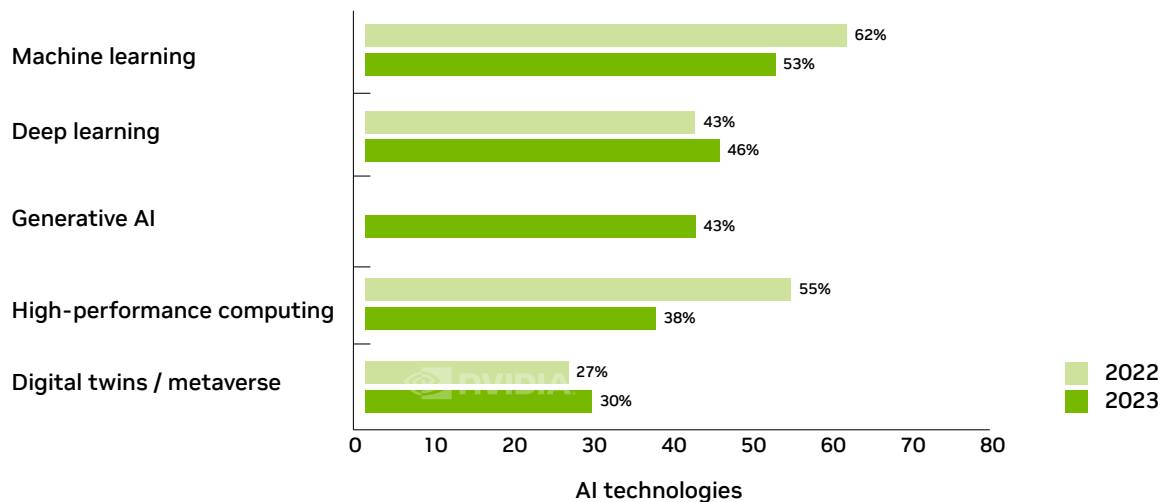
## The Telecom Industry Has Embraced the Generative AI Wave

It's clear that generative AI and large language models (LLMs) are the breakout AI technology of the year. Generative AI did not feature in the 2022 survey. But in the 2023 survey, 43 percent of respondents reported they were investing in it, showing clear evidence that the telecom industry is enthusiastically embracing the generative AI wave to address a wide variety of business needs.

Generative AI is a promising asset across many areas of the telecom value chain. Among respondents who are investing in AI, 57 percent are using generative AI to improve customer service and support, 57 percent to improve employee productivity, 48 percent for network operations and management, 40 percent for network planning and design, and 32 percent for marketing content generation.

In addition to use cases, the survey also revealed how the industry is developing and deploying **LLM models for generative AI**. Some 40 percent of respondents used their own data to train an internal generative AI model, which they then use to augment their existing solutions, while 29 percent built or customized a model with a partner. Likewise, 40 percent of respondents prefer on-premises deployment, while 37 percent reported low latency and speed of output are important to them.

### Which of the following is your company investing in today?



## Enhancing Customer Experience Is the Biggest Opportunity

Enhancing customer experiences is the biggest AI opportunity for the telecom industry. In this survey, 48 percent of respondents selected it as their main goal for using AI, with the number rising to 57 percent for generative AI. Some 35 percent of respondents identified customer experiences as their key AI success story.

Telcos are using AI to improve engagement through solutions that offer virtual assistance, enrich the retail experience, provide recommendations, and manage customer churn.

**48%** are investing in optimizing customer experiences with AI.

This is understandable for an industry that serves over 5 billion customers worldwide and where churn management is a key metric for measuring the performance of individual telecom operators. Other clear opportunities include using AI to reduce cost, improve employee productivity, and improve network operations.

### What does your company expect to achieve with AI?



### AI Is Improving Both Revenues and Cost Savings

The ultimate outcome for stakeholders in the industry is to grow their revenues or reduce costs with AI. Among all respondents, 67 percent reported that AI adoption has helped them increase revenues, with 19 percent of respondents noting that this revenue growth is more than 10 percent. For respondents who are at least in the trial or pilot stage, 71 percent reported that AI adoption has helped them increase revenues in specific business areas.

A similar picture is emerging for cost reduction. Among all respondents, 63 percent reported that AI adoption has helped them reduce costs in specific business areas, with 14 percent noting that this cost reduction is more than 10 percent. For those who are at least in the trial or pilot stage, 66 percent of respondents reported that AI adoption has helped them reduce costs.

The emerging picture of revenue and cost benefits bodes well for an industry with a multibillion-dollar spend on both capex and opex that simultaneously struggles to sufficiently grow its revenues.

**67%** reported revenue increases from AI.

### What was the impact of AI in the last year (in specific business areas)?

	Increasing annual revenue	Reducing annual costs
<5%	<b>27%</b>	<b>28%</b>
5-10%	<b>21%</b>	<b>21%</b>
>10%	<b>19%</b>	<b>14%</b>

## Skill Shortage Is a Major Challenge to Adopting and Implementing AI and Generative AI

Despite the successes recorded so far, several challenges continue to hinder the widespread adoption of AI and generative AI in the industry. In the 2023 survey, a lack of skills or finding the appropriate skilled labor is the top challenge for AI (34%) and generative AI (55%). The second top challenge is about establishing a robust business case with a clear ROI. Overall, 33 percent of respondents reported they struggled to quantify the ROI.

Notably, the percentage of respondents concerned about these two challenges has gone down between 2022 and 2023. The inability to quantify ROI was the biggest challenge in 2022, reported by 46 percent of respondents, while having too few data scientists was a concern for 36 percent of respondents. These results suggest that, in the past year, many companies have worked hard to gain a better understanding of how to deploy and capture value with AI solutions in their organizations.

Other barriers include a mix of technical challenges—including poor technology infrastructure, a lack of data, and data privacy concerns—and budget constraints. Notably, the number of respondents concerned about other challenges, except cybersecurity, also trended down between 2022 and 2023. Growing concern about cybersecurity is understandable in an industry that operates critical national infrastructure in many countries, often in the face of fraud and geopolitical considerations.

**34%** say there are too few data scientists to support their AI aspirations

### What are your challenges to achieving your AI goals?\*

	2022	2023
Too few data scientists	36%	34%
Inability to quantify ROI	46%	33%
Poor technology infrastructure	33%	30%
Lack of budget	35%	30%
Data privacy concerns	30%	26%
Lack of data	24%	25%
Cybersecurity	17%	20%
Executive team is unsupportive	11%	4%

\* Excludes “Don’t Know” responses

## Investments in AI

### AI Investment Is Growing but Remains Low

Investments in AI are growing as telcos deepen their commitment to AI adoption and seek to overcome the challenges facing them. These investments are in AI infrastructure and models, which enable telcos to transform their legacy infrastructure into AI-ready platforms or deploy AI to address business needs.

In the 2023 survey, 43 percent of respondents reported an investment of over \$1 million in AI in 2022, 52 percent reported the same in 2023, and 66 percent reported their budget for AI infrastructure will increase in 2024. These figures show a steady growth compared to the results in the 2022 survey.

**96%** will either increase or maintain their AI spend in 2024.

But AI investments remain low and suggest that the industry is still in the early investment stage. This is improving, though, as there was a rise in the number of respondents reporting investments of over \$50 million in the 2023 survey. This increased by four percentage points to 7 percent, reflecting a scale-up in AI infrastructure to handle generative AI.

### How is your budget going to change for AI infrastructure in the next year?

	2022	2023
Increasing	47%	66%
Staying the same	45%	30%
Decreasing	8%	4%

### Customer Experiences Are Attracting the Highest AI Investment

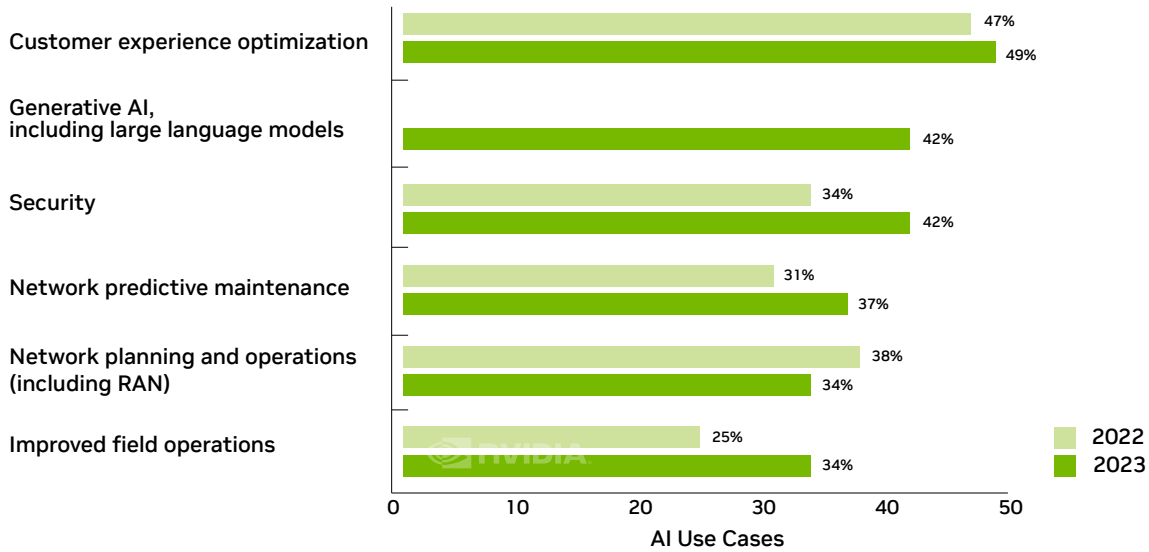
Investing in customer experience optimization is the most popular AI use case for 2023 (49% of respondents), similar to 2022 (47% of respondents). Looking specifically at generative AI, customer service and support are the most popular investments at 57 percent of respondents. These are expected given that customer experiences are viewed by respondents as the biggest AI opportunity.

Telcos are also investing in other AI use cases beyond customer experiences. Security (42%), network predictive maintenance (37%), network planning and operations (34%), and field operations (34%) are other notable examples. However, using AI for fraud detection in transactions and payments had the biggest jump in popularity between 2022 and 2023, rising 14 points to 28 percent of respondents.

**42%** will invest in generative AI (including large language models) in 2024.

The diversity of AI use cases in the telecom industry is also reflected in the survey results. Overall, 31 percent of respondents said they invested in at least six AI use cases in 2023, while 40 percent are planning to scale to six or more use cases in 2024.

### What is your company investing in today?



### Scaling From Pilot to Implementation Is the Top Driver for AI Investments

As the perception of AI improves and uncertainty (e.g., regarding ROI) recedes, telcos are keen to move from proof of concept (PoC) and pilots to implementations for their AI-powered applications. This is the major driver for AI investments for 50 percent of respondents who are investing in AI. So far, 41 percent of overall respondents have made that transition and are now in the implementation phase.

**50%** are investing to scale AI from pilot to implementation.

Besides scaling from PoCs, economic uncertainty and the need to prioritize spending elsewhere also drove decision-making. Some 32 percent of respondents cited concerns about the economy. Similarly, 29 percent of respondents reported AI investments will be balanced against spending on scheduled infrastructure upgrades, while 24 percent noted that their market differentiation strategies are a major factor in their AI investment decisions.

Comparing the 2023 and 2022 survey results highlights several crucial developments. Economic uncertainty has declined in importance as the world moves further away from the pandemic years. Likewise, infrastructure upgrades and market differentiation are lower priorities, reflecting that AI is increasingly being seen as a mainstream business need rather than an exceptional business requirement.

### What factors impact AI investment decisions?

	2022	2023
Moving from proof of concept to production/scale	<b>50%</b>	<b>50%</b>
Economic uncertainty	<b>49%</b>	<b>32%</b>
Infrastructure upgrades	<b>49%</b>	<b>29%</b>
Market differentiation	<b>36%</b>	<b>24%</b>
Change in priority of data science	<b>22%</b>	<b>13%</b>



## Implementation Approaches

**31%** prefer to run most of their AI workloads exclusively in the cloud.

### Hybrid Hosting for AI Is Preferred but Cloud Hosting Is Growing

As AI becomes more mainstream for telcos, the choice of platform for running AI is becoming strategic. So far, the momentum seems to be decidedly toward cloud hosting, suggesting a growing need for more localized cloud infrastructure. In the 2023 survey, 31 percent of respondents reported that they run most of their AI workloads in the cloud, compared to 21 percent of respondents in the 2022 survey.

In contrast, 25 percent of respondents are running their AI projects and workloads on on-premises infrastructure. This is only up from 23 percent in the 2022 survey. Overall, a hybrid configuration using a mixture of cloud and on-premises infrastructure is still the dominant hosting model, although it's decreasing in popularity. In the 2023 survey, 44 percent of respondents were using a hybrid model, and this was down from 56 percent in the 2022 survey.

Moving toward 2024, 49 percent of respondents reported they'll remain hybrid, 33 percent will be in the cloud, and 18 percent will be on premises. Yet, two insights suggest that these preferences are unlikely to remain static for 2024. First, current satisfaction levels look average. Only 51 percent of respondents are satisfied with cloud and 44 percent are satisfied with on premises. Secondly, regarding generative AI, 40 percent of respondents prefer to deploy large language models on premises.

### Where do you run or plan to run most of your AI projects/workloads?

	Current Year	Next Year
In cloud	<b>31%</b>	<b>33%</b>
On premises	<b>25%</b>	<b>18%</b>
Hybrid (both)	<b>44%</b>	<b>49%</b>

### Partnerships Remain Critical for Adoption of AI Solutions in the Industry

In the 2023 survey, 44 percent of respondents reported that co-development with partners is their company's preferred approach to developing AI solutions. Some 28 percent of respondents prefer to use open-source tools, while 25 percent prefer an AI-as-a-service approach.

Partnerships are important to augment internal AI capabilities. Only 14 percent of respondents believe that their AI capabilities are industry leading, with 32 percent worried that they're industry laggards. As a result, seeking to engage with third parties to accelerate AI adoption was the top priority for respondents when spending on AI technologies. Partnerships also create opportunities for telcos to create new services for customers at lower investment and with the ability to scale fast. Forty-nine percent of respondents reported that they develop AI solutions for both internal and external users.

But sometimes the preference for partnerships is nuanced. For generative AI, 40 percent of respondents augmented existing solutions with generative

AI capabilities and trained the AI models on their own data. In contrast, only 29 percent of respondents built or customized models with a partner. This is understandable for the telecom industry with its stringent data protection rules.

### How do companies develop AI solutions today?

	2022	2023
Co-development with partners	49%	44%
Open-source tools	33%	28%
Build it ourselves	31%	27%
AI as a service	32%	25%
Data science modeling tools	35%	19%
Automated machine learning	28%	19%
Enterprise software	22%	15%
Outsource it	25%	12%

## Looking Forward

The role of AI in the telecom industry is deepening. The inaugural edition of the State of AI in Telecommunications, a year ago, identified the status of AI in the telecommunications industry and the key areas where AI is transforming it. Since then, and with the advent of generative AI, AI has become even more impactful across society and the world's leading industries. In this edition, insights from industry respondents make it clear that the status and impact of AI are accelerating.

Adoption of AI is important for telcos, because AI is a key agent for driving technological innovation, creating new products and services, modernizing the infrastructure, improving operational excellence, and delivering profitability to industry stakeholders. For an industry that delivers critical infrastructure and services across enterprise and consumer industries, AI enables telcos to sustainably and efficiently deliver connectivity for communication and online services around the world.

As adoption grows, AI, and especially generative AI, will evolve to become an integral part of the technological and investment roadmap for the telecom industry. AI is integral to next-generation cellular networks, helping the industry to realize the expectations for 5G and deliver powerful new applications and services. This allows telcos to deliver a return on the significant investments they're making in capital expenditures, spectrum, deployment, and maintenance.

## Ready to Get Started?

Explore NVIDIA's AI solutions and platforms for telecommunications at [www.nvidia.com/telco-ai](http://www.nvidia.com/telco-ai)

