

Fueling the
AI transformation:
Four key actions
powering widespread
value from AI, right now.

Deloitte's State of AI in the Enterprise,
5th Edition report



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Foreword: The era of value

In recent years, we've navigated unprecedented disruption in the economy and society at large. A global pandemic. Shifting worker needs. And the general realization that none of us can continue to do business as usual.

Artificial intelligence has a unique and powerful role to play in meeting many of the challenges presented to us today. We are further encouraged that we find ourselves living in a time when data infrastructure and processing power offer the necessary foundations to fuel truly transformational applications and rapid innovation of artificial intelligence (AI).

As we have watched these rapid shifts occur, we see the opportunities in present challenges. And yet, we have also seen how many business leaders set their sights too low—and thus fall short—of the enormous potential AI presents to us.

Today's race is no longer about adopting AI or automating processes for efficiency. It is now about realizing value, driving outcomes, and unleashing the potential AI holds to drive new opportunity for our businesses, for our employees and for our society at large. It is about cracking open the constraints of how we have done business before.

The fifth edition of our annual State of AI in the Enterprise research explores just that: how businesses are forging a path to a new future, one filled with unrealized sources of value. In it, we explore four key actions that many business leaders are taking to harness AI's potential and drive value at scale across their enterprises:

Invest in culture and leadership:

Leaders should embark on reinventing work to capitalize on the growing optimism and opportunity that their human workforce sees in AI. People are still at the core of a business' success, and AI can help unleash the power of a combined human and machine workforce.

Transform operations:

To ensure ethical and quality application of AI, the entire operating model may need to change to accommodate the unique capabilities of intelligent machines. Workflows and roles should be reevaluated to manage risk and achieve new value.

Orchestrate tech and talent:

On the flip side of the culture and leadership coin, companies must develop their AI strategies in a tight talent market, with growing off-the-shelf platforms, tools and accelerators that can jump-start a company's transformation.

Select high-value use cases:

AI is fueling transformations across all industries, and many leaders have begun to unlock which use cases are driving the most value within their given context. The important takeaway is to orchestrate a strategy of both near- and long-term differentiating applications of AI:

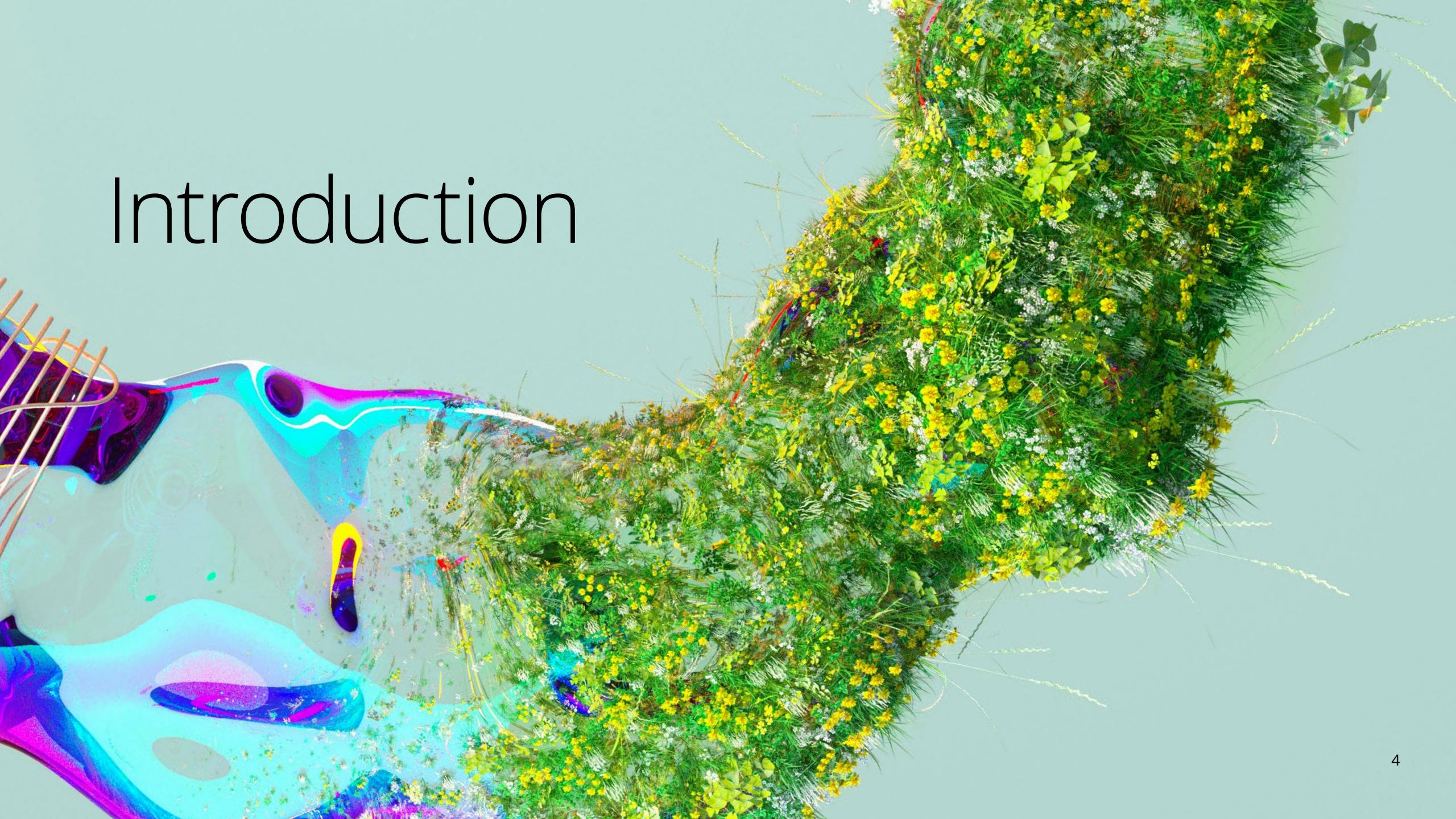
Again this year, we clearly state that we are early on in the Age of With™—an era defined by human *with* machine collaboration—yet we see signs that businesses are ever closer to realizing AI opportunity and applying next-level human cognition.

We hope this report supports your business in not just realizing the potential of AI, but also in imagining how much further it can take you.

- Nitin Mittal, Irfan Saif and Beena Ammanath

Please note: Unless otherwise specified, the statistics, insights and analysis within this report are attributed to Deloitte's owned State of AI in the Enterprise research. The case studies are attributable to Deloitte client work experience.

Introduction





Introduction

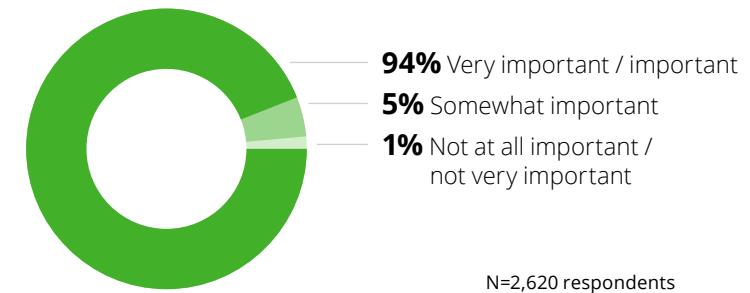
Is an increase in AI deployments yielding fewer outcomes?

The AI market continues to advance rapidly, and leaders across industries consistently report how important this technology is to their future. In fact, in our most recent State of AI in the Enterprise survey 94% of business leaders reported that AI is critical to success over the next five years. Yet challenges persist in achieving outcomes at scale.

Since 2017 Deloitte has been tracking the advancement of AI across industries through surveys of global business leaders. Our fourth edition report pivoted to look at the wide set of leading practices needed to scale AI across an enterprise and achieve meaningful results. With the fifth edition we advance that journey, digging deeper into additional actions and decisions that can lead to outcomes—or middling results.

94% of business leaders surveyed agree that AI is critical to success over the next five years. Yet as organizations deploy more AI, outcomes appear to be lagging.

Importance of AI solutions for organizations' overall success



N=2,620 respondents

The market is accelerating rapidly—but outcomes are lagging

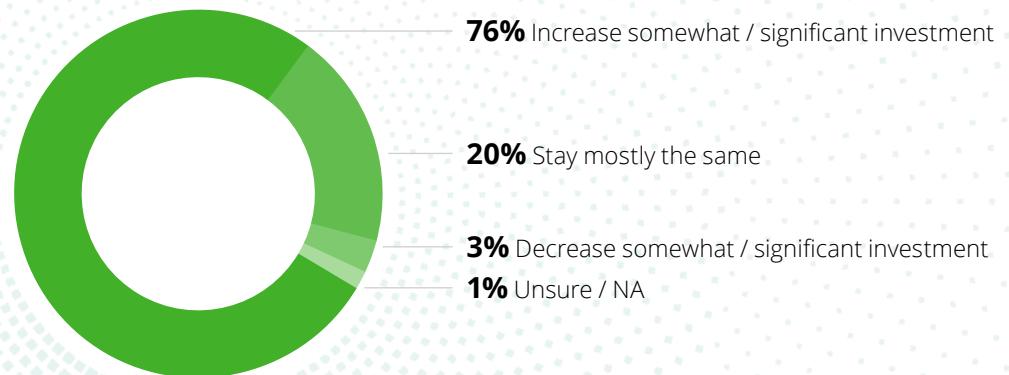
This year's survey found that, unfortunately, many organizations are struggling with middling results, despite increased deployment activity. Seventy-nine percent of respondents reported achieving full-scale deployment for three or more types of AI applications—up from 62% last year. Yet, the percentage of respondents that now find themselves in the Underachievers category (High-deployed / Low-achieving) rose to 22% this year from 17% last year (for complete Methodology description, please refer to page 48).

Even so, 76% of respondents reported they plan to increase their investments in AI to gain more benefits. Increases are slowing slightly (down from 85% who planned increased investment in 2021) indicating that funding may be leveling off after the last few years of significant increase. However, very few respondents (3%) reported a decrease in investment.

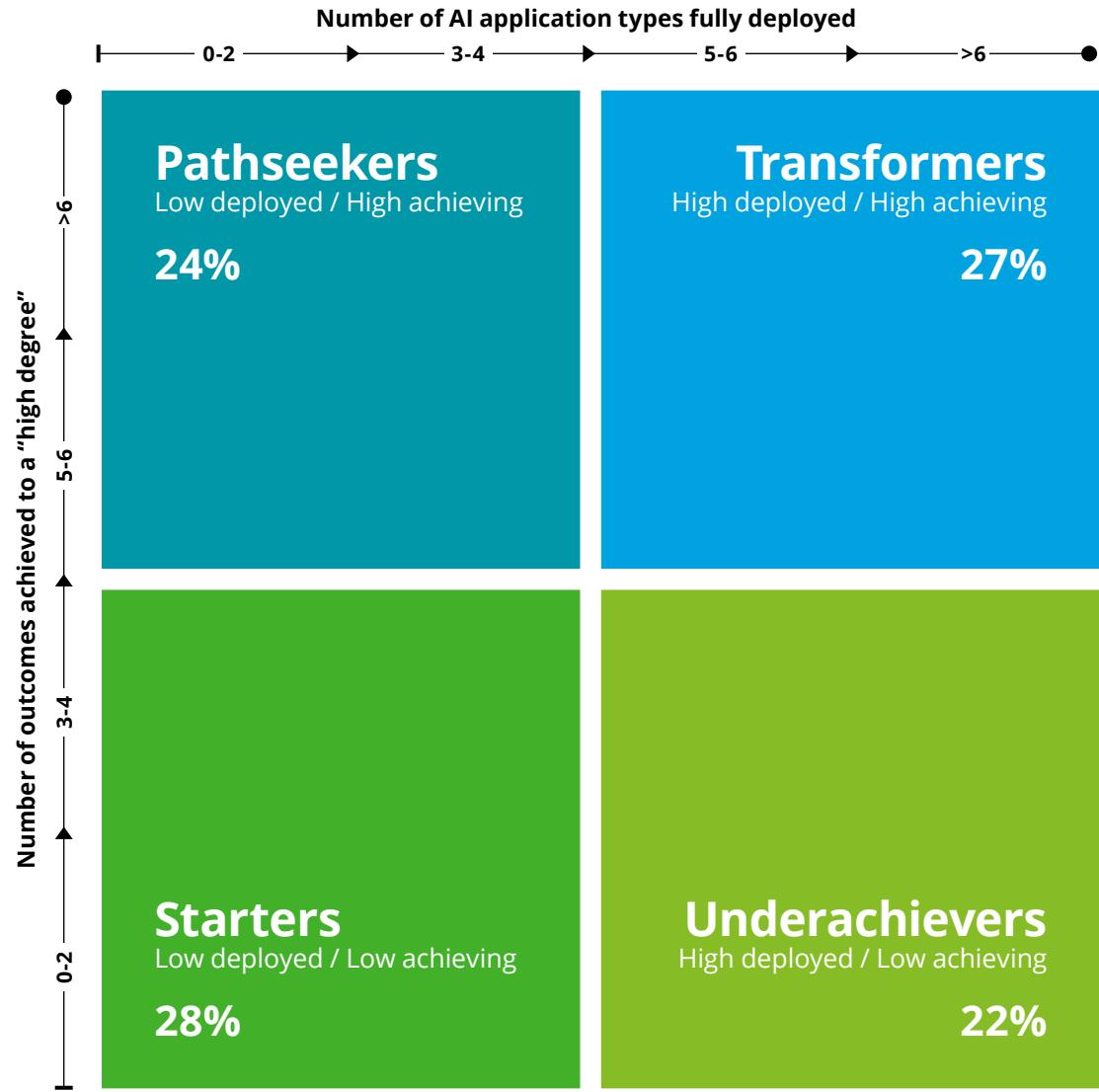
This underscores the persistent belief in and importance of AI in the years ahead.

79% of leaders surveyed reported full-scale deployment for three or more types of AI applications—up from 62% last year.

Expected AI investment in the next fiscal year



N=2,620 respondents



Our analysis model

For the 2022 survey, we used the same foundational analysis model as for State of AI in the Enterprise, 4th Edition, with slight adjustments to reflect increasing AI activity in the market. Across the 2,620 respondents, the breakdown of performance is shown here.

Transformers

(High deployed / High achieving): Transforming but not fully transformed, this group has identified and largely adopted leading practices associated with the strongest AI outcomes.

Pathseekers

(Low deployed / High achieving): This group has adopted capabilities and behaviors that are leading to success but in fewer initiatives. In other words, they are making the right moves but have not scaled multiple forms of AI to the same degree as Transformers.

Underachievers

(High deployed / Low achieving): A significant amount of development and deployment activity characterizes this group; however, they haven't adopted enough leading practices to help them effectively achieve more meaningful outcomes.

Starters

(Low deployed / Low achieving): Getting a late start in building AI capabilities seems to characterize this group; they are least likely to demonstrate leading practice behaviors.

*Percentages do not add to 100%, owing to rounding. N=2,620 respondents.

Challenges—the known and the unknown

Survey respondents reported varying challenges depending on the stage of AI implementation. When starting new AI projects, the top reported challenge is proving AI's business value (37%). As organizations attempt to scale up their AI projects over time, key impediments such as managing AI-related risks (50%), lack of executive buy-in (50%), and lack of maintenance or ongoing support (50%) push toward the top of the list.

This emphasizes the resounding importance of clear leadership and focused investment that a successful AI transformation requires, reiterated by respondents throughout both the fourth and fifth editions of this research. More so, it demonstrates the ongoing challenge of establishing the coordination and discipline needed to consistently fund initiatives after they have ceased to be the shiny object. Much of building an AI-fueled organization requires discipline and focus to maintain systems and algorithms so that they can continue generating ongoing value instead of noise. That discipline and focus extend to vigilant discovery and understanding of all associated challenges that may not be obvious in the early stages of an AI initiative.

Top 3 challenges in starting projects

37% Challenges proving business value

34% Lack of executive commitment

33% Choosing the right AI technologies

N=2,620 respondents

Top 3 challenges in both starting and scaling projects

30% Insufficient funding for AI technologies and solutions

29% Lack of technical skills

29% Choosing the right AI technologies

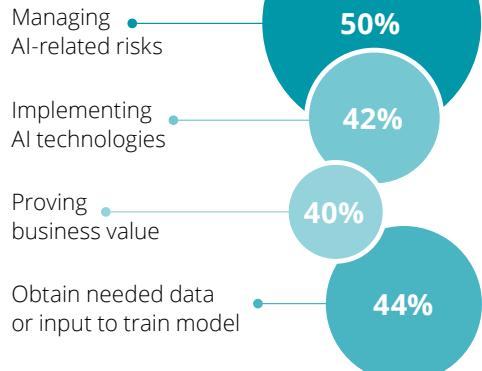
N=2,620 respondents



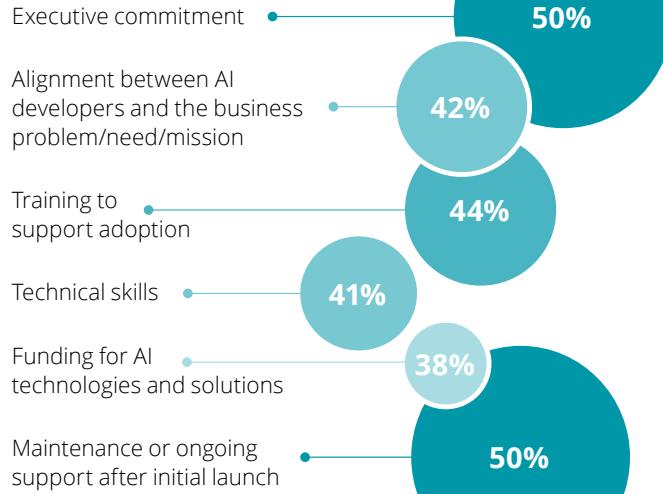
N=2,620 respondents

Challenges in scaling AI initiatives

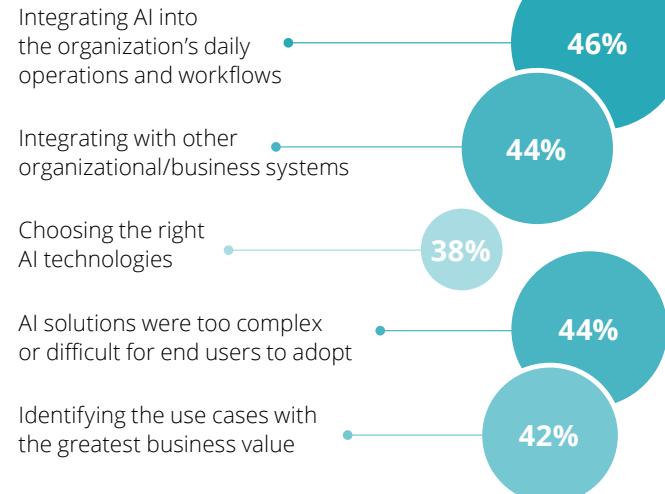
Barriers



Insufficiencies



Difficulties



A close-up, over-the-shoulder shot of a woman with dark hair and glasses, smiling warmly at the camera. She is wearing a black top and a small hoop earring. In the background, another person's hands are visible, working on a laptop. The scene is set in an office environment with papers and a clipboard on the desk.

"If you believe this is fundamental to the success of what your business is going to be, you don't layer [its leadership] deep into the organization."

– AI/ML head of strategy and operations
Global technology company

Seeing results

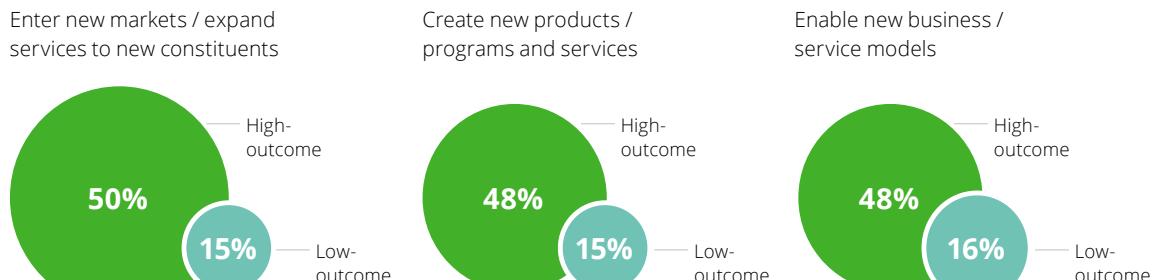
Interestingly, 87% of respondents reported that they are now finding the length of payback period to land within their expectations or faster. While on the one hand this indicates an increased understanding of implementation requirements, it could also suggest that the vision for AI may be too focused on cost savings, and that the transformational opportunities that AI can offer, which often have less predictable timelines, are being overlooked or ignored.

This is further underscored by the wanted outcomes respondents reported most frequently—reduced costs (78%). When organizations prioritize efficiency, more transformational outcomes, like revenue generation or business innovation, can fall by the wayside.

That said, some organizations have begun to find a path. Consistent with findings from the fourth edition, respondents from this year's high-outcome organizations (Transformers and Pathseekers) were significantly more likely to report revenue-generating results—such as entering new markets / expanding services to new constituents, creating new products / programs or services, or enabling new business / service models.

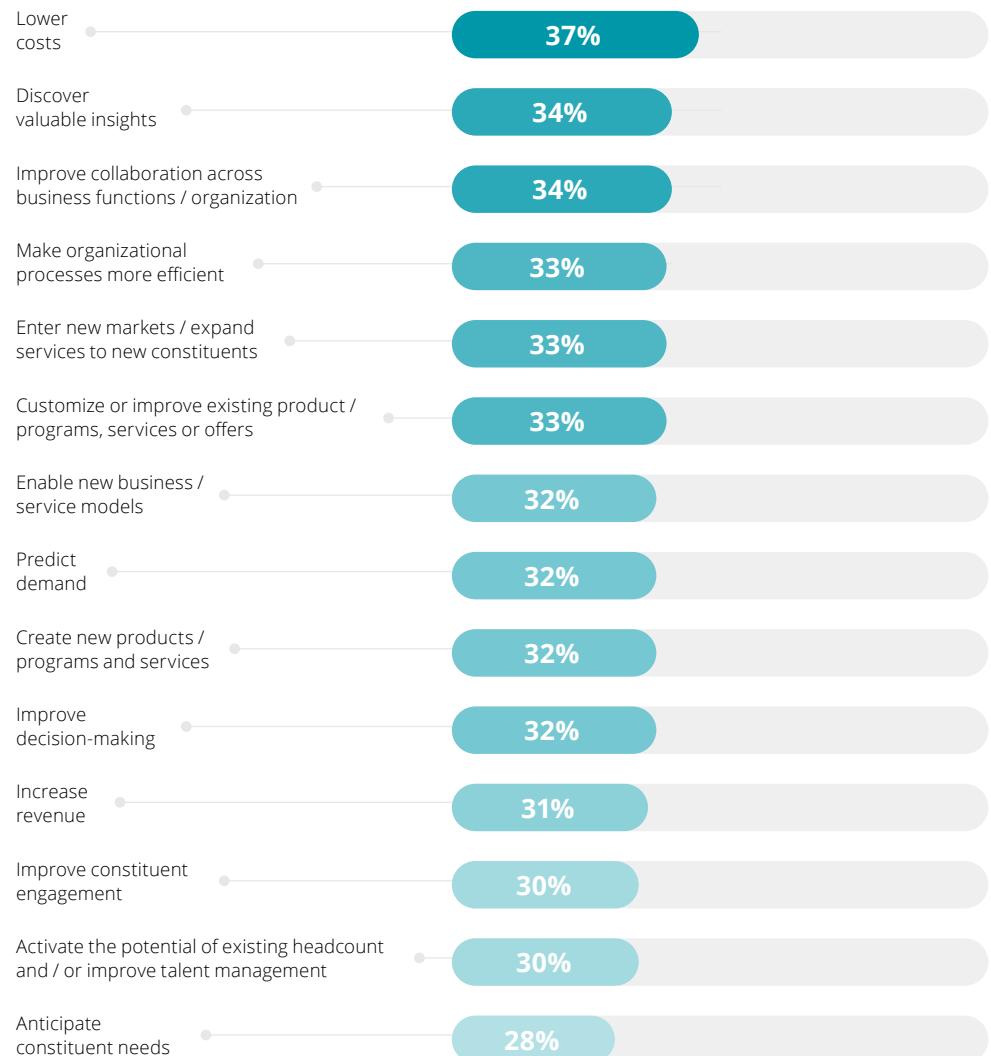
Revenue-generating outcomes—High- vs. Low-outcome organizations

(Selecting “Achieved to a high degree”)



N=2,620 respondents

Outcomes—“Achieved to a high degree”



N=2,620 respondents

Rewards can be lucrative for organizations that overcome these challenges

AI has entered the era of value creation. Based on our analysis of the behaviors and responses of respondents from surveyed high- and low-outcome organizations, in the remaining report you will find detailed recommendations or the actions leaders should consider in order to help improve outcomes of their AI efforts.



Action 1

Invest in culture and leadership

The workforce is increasingly optimistic, and leaders could do more to harness that optimism for culture change, establishing new ways of working, and to drive greater business results with AI.



Action 2

Transform operations

An organization's ability to build and deploy AI ethically and at scale largely depends on how well it has redesigned operations to accommodate the unique demands of new technologies.



Action 3

Orchestrate tech and talent

Technology and talent acquisition should no longer be considered separate. Organizations should strategize their approaches to AI based on the skill sets they have available, whether they derive from humans or pre-packaged solutions.



Action 4

Select use cases that can help accelerate value

Selecting the right use cases to fuel your organization's AI journey depends largely on the value drivers for your business, influenced by your sector and industry context. Learn about some of the top use cases driving change for your industry.

“Doing the actual AI is the easiest part of these projects. The hardest part is helping everyone involved understand what the problem is that we’re trying to solve.”

– VP of data science, innovation and operations
Commercial data analytics and business insights company



Action 1

Invest in culture
and leadership



Culture is often key to success, and the workforce is increasingly optimistic about AI opportunities

When it comes to successful AI deployment and adoption, leadership and culture matter. A lot.

Transformers were the most likely to report AI-ready cultural characteristics, such as:

- High cross-organizational collaboration
- Workforce optimism for the possibilities of AI
- Actively nurturing and retaining AI professionals

Respondents across all maturity segments reported that agility and willingness to change combined with executive leadership around a vision for how AI will be used are the most important factors in the development of an AI-ready culture (42% and 40% reported this as extremely important, respectively). This reinforces the importance of thoughtful [change management](#) as a foundational element of successful AI transformation; high-outcome organizations were more than 55% more likely to invest in change management compared to low-outcome organizations. Despite frequent underinvestment in change management, workforces are showing increasing optimism toward the possibilities AI could offer their careers: 82% of respondents surveyed indicate employees believe that working with AI technologies will enhance their performance and job satisfaction.

82% of respondents surveyed indicated their employees believe that working with AI technologies will enhance their performance and job satisfaction.

Do respondents believe working with AI technologies will enhance their performance and job satisfaction?



82% Strongly agree / agree

16% Neither agree nor disagree

2% Strongly disagree / disagree

1% Unsure

N=2,620 respondents
Percentages do not add to 100%, owing to rounding.

Respondents selecting "Achieved to high degree" / "Strongly agree"

56%
Transformers report significantly improving collaboration across business functions / organizations

45%
Transformers "strongly agree" that employees in their organizations believe that working with AI technologies will enhance their performance and job satisfaction

44%
Transformers "strongly agree" that their organizations actively work to nurture, train and retain AI-skilled professionals

N=2,620 respondents

“People always underestimate the change management aspect, what's going to be required. They think it's always going to be easier.”

– Organizational design consultant



However, there remain gaps in harnessing increased workforce optimism

This growing workforce optimism may be the result of a shift in thinking in recent years. Many organizations have begun to realize the benefits of using AI to augment the workforce, rather than replace as many jobs as possible.¹ In fact, a minority of surveyed organizations (30%) indicated a strong desire to automate as many jobs as possible.

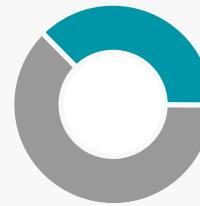
Many organizations are taking action to support a human-machine collaboration strategy: 43% of all respondents reported their organization has appointed a leader responsible for helping workers collaborate better with intelligent machines. Also, 44% of all respondents reported using AI to assist in decision-making at senior-most levels.

Despite this, data also shows a significant gap in further actions needed to enable the hybrid human-machine workforce. Only 21% of all respondents reported actively educating workers on when to apply AI most effectively, 25% reported providing access of user-friendly AI systems to nontechnical / nonspecialized workers, 30% reported including workers in participative design of AI, and 36% reported redesigning organizational practices in light of a mixed human and machine workforce. Similarly, a minority of high-outcome organizations (32%) reported taking significant action needed to bring workers into greater collaboration with AI systems using innovation rewards or incentives for AI pilots.

One of the biggest opportunities organizations may have for driving greater value with AI is redesigning work itself.²

While **43% of respondents** report appointing a leader responsible for effective human and AI collaboration, concrete actions are lagging:

% orgs redesigning talent practices for mixed workforce



36%
Redesigning talent practices for mixed workforce
64%
Not redesigning talent practices for mixed workforce

% orgs providing user-friendly AI systems to workforce



25%
Providing user-friendly AI systems to workforce
75%
Not providing user-friendly AI systems to workforce

% orgs investing in human / machine collaboration



30%
Making investments
70%
Not making investments

% orgs educating workers to apply, use AI effectively



21%
Educating workers to apply, use AI effectively
79%
Not educating workers to apply, use AI effectively

% orgs involving workers in participative design of AI



30%
Involving workers in participative design of AI
70%
Not involving workers in participative design of AI

N=2,620 respondents

Improving human and machine collaboration

One of the biggest challenges to enabling stronger human and machine collaboration may be that leading practices around the talent models most likely to generate results are still emerging.

That doesn't mean all is unknown. An important element that has emerged in establishing positive working relationships with intelligent machines is to focus on fostering trust in algorithms by involving business specialists and frontline employees to help design them.

For example, global retailer H&M has focused on bringing humans into the development process to both shift the culture and improve adoption of AI across the business. In an early AI pilot for the company, H&M involved merchandizers in testing and development of an end-of-season sale pricing algorithm.³ By involving merchandizers throughout development and testing, and doing quality tests comparing the algorithms and the human workforce results along the way, the company found that the combined human and machine workflow produced better results than either could achieve alone.⁴ And not only that, bringing the human workforce along that journey helped to shift the culture and attitudes around a transformational technology.



“Culture is still a big barrier, and also the way that the organization used to operate. Working around that is still a very big barrier.”

– Group CIO
Multinational oil & gas company

Action 2

Transform operations

If you're not changing how you work, you're leaving value on the table

As AI has become foundational to success, a large number of organizations are redesigning their business operations around it—a key step to ensure adoption as well as quality and ethical use. Despite this, most organizations have a ways to go to achieve maturity in this area, and there hasn't been a lot of significant improvement reported since the last edition of the survey.

Despite evidence that establishing clear processes and redefining roles to deliver quality AI result in improved outcomes, there has been little growth in the market in terms of adopting such practices, according to survey respondents in either of the last two State of AI surveys. In both the fourth and fifth editions, just one-third of respondents reported that their companies are *always* following MLOps, redesigning workflows and documenting AI model life cycles.

This lack of progress is significant because in both editions operational leading practices were among the behaviors most highly associated with outcomes. In other words, putting the effort into working differently and consistently assessing and addressing AI models on an ongoing basis are among the most important areas of focus for an organization seeking improved results.⁵



"To be competitive, you have to challenge operations and processes."

– Group manager

Multinational engineering and technology company

Action 2: Transform operations

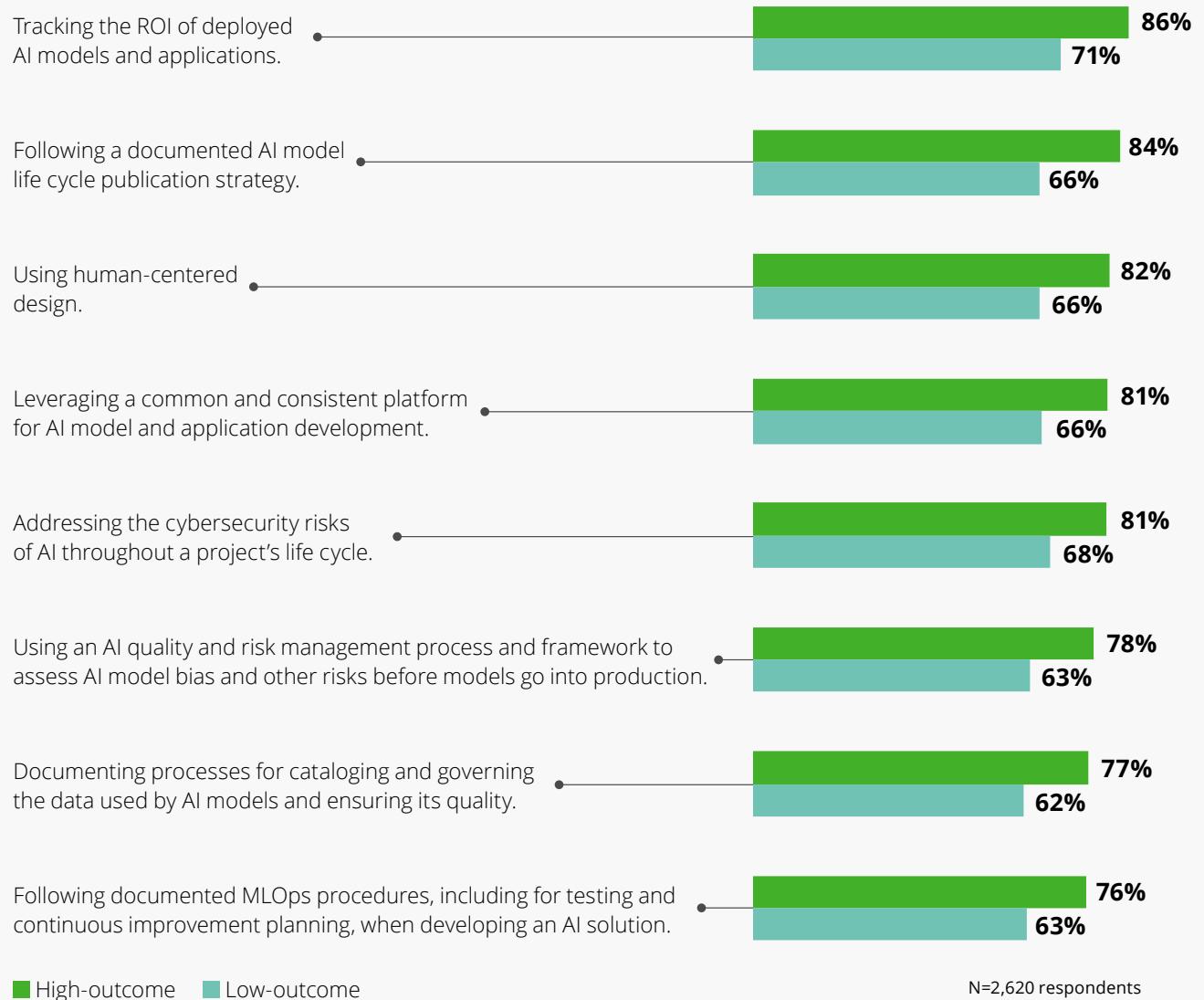
Despite that lack of progress in consistently adopting operational leading practices, some evidence from this year's survey appears to reaffirm that high-outcome organizations are significantly more likely to adopt additional operational leading practices including:

- Tracking the ROI of deployed models and applications (86% high-outcome vs. 71% low-outcome)
- Having a documented process for governance and quality of data put into AI models (77% high-outcome vs. 62% low-outcome)
- Following documented MLOps procedures (76% high-outcome vs. 63% low-outcome)
- Following a documented AI model life cycle publication strategy (84% high-outcome vs. 66% low-outcome)
- Leveraging a common and consistent platform for AI model and application development (81% high-outcome vs. 66% low-outcome)
- Using an AI quality and risk management process and framework to assess AI model bias and other risks before models go into production (78% high-outcome vs. 63% low-outcome)

These findings suggest that taking and sustaining these and other similar actions may result in better AI outcomes. Such is especially relevant given that a clear majority (60%) of respondents viewed AI solutions as strategically "very important" for their organizations' success, including more than 55% of respondents from low-outcome organizations.

Operations leading practices—High- vs. Low-outcome organizations

(Respondents selecting "Usually" or "Always")



Managing AI risk

Beyond these leading practices, our survey also underscores how engaging in specific risk-mitigation steps can also help drive better outcomes. AI-related risks represent an issue of high importance to organizations. Our survey found that risks around lack of explainability and transparency in AI decisions, data privacy or consent mismanagement, and safety concerns about AI systems, among others, all loom large as ethical risks that concern organizations.

Trustworthy AITM⁶ ultimately hinges on ensuring that rigorous processes as well as checks and balances are in place. To that end, organizations can often achieve better outcomes when they adopt an ethical AI framework that aligns with [Trustworthy AI principles](#). Across all attributes in the survey, respondents from high-outcome organizations tend to report having more of these operational processes in place, which can help to increase confidence that their AI solutions are meeting ethical and quality standards.

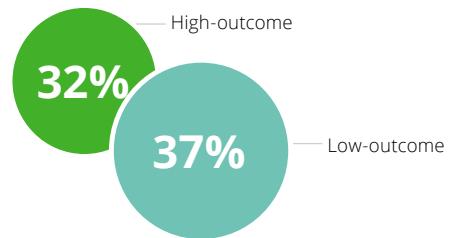
Managing these risks can have a major impact on an organization's AI efforts. In fact, 50% of respondents cited management of AI-related risks as one of the top inhibitors to scaling AI projects. Despite such sentiments, only 33% of respondents have aligned their AI risk management with their organization's

broader risk management efforts. However, 33% of high-outcome surveyed organizations and 29% of low-outcome surveyed organizations do engage outside vendors to independently audit their AI systems.

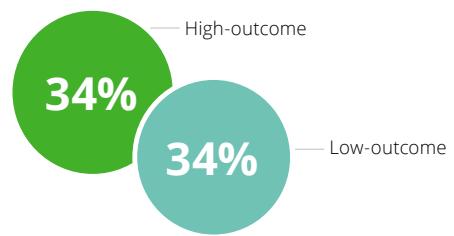
By and large, surveyed organizations rely heavily on training as a key to mitigating AI risk. In fact, respondents' top two risk-mitigation strategies are training AI developers to recognize and resolve AI ethical issues (35%) and training / supporting employees to foster productive, positive relationships to AI (34%). There may be some question about how significant this action is in reality—responses to other parts of the survey suggest AI-related training might be less widespread than it needs to be for successful transformation and risk mitigation.

Risk mitigation strategies— High- vs. Low-outcome organizations

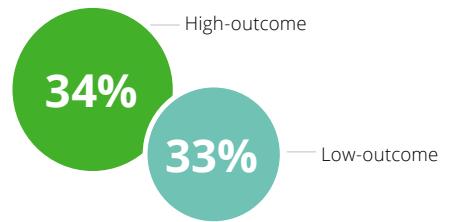
Training practitioners who build AI systems how to recognize and resolve ethical issues around AI



Providing training / support to help employees foster productive, positive relationships to AI



Collaborating with external parties on leading practices around AI ethics





Action 2: Transform operations

Case study: Addressing AI risk—ethically

A financial services company faced increased risk exposure from its AI due to inconsistent monitoring, risk identification, governance and documentation of multiple applications across its business units. Its AI models and applications were generating results quickly, sometimes within a few hours. And since, by their nature, AI models have an inherent ability to learn and make algorithmic adjustments to optimize their performance, risks could spiral out of control quickly without a strong mitigation strategy.

The issues potentially exposed the company to poor customer experiences, negative brand image, and legal, regulatory and compliance violations. The organization's executives realized that they needed a more robust mechanism to ensure the AI algorithms operated within the guardrails of how the company intended them to operate.

To address this, the company set out to develop a rigorous process for managing current risk and keeping a watch on emerging ones. To begin, it conducted an in-depth analysis across 60 AI models owned across different business functions in order to capture a clear risk profile of each one. AI governance and risk management specialists then collaborated with the company's data science team to review the AI models and develop a risk assessment. Each AI model was

reviewed against key risk dimensions and a foundational ethical AI framework.

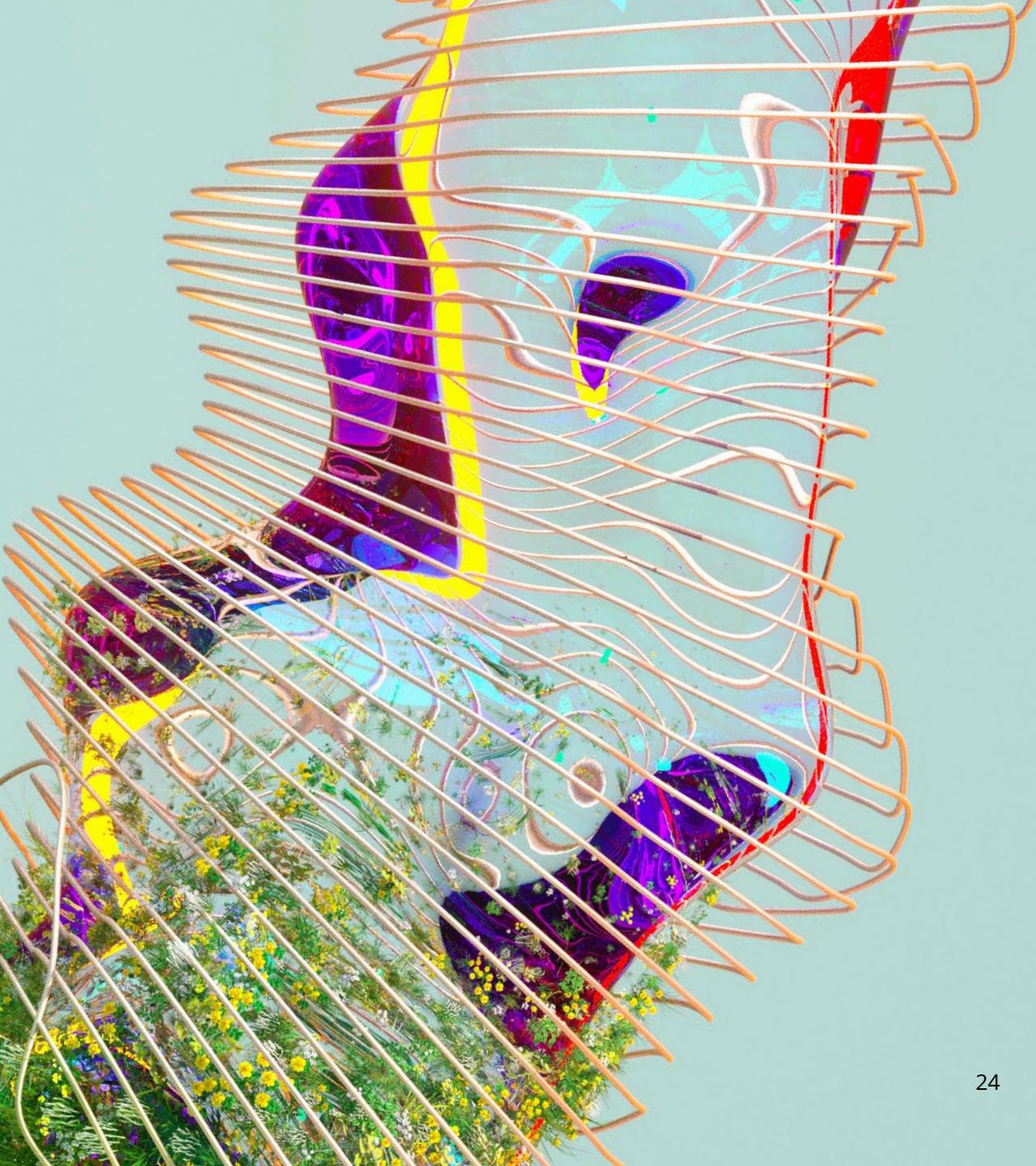
Recommended steps included process changes to address and mitigate issues while enabling responsible AI model development and deployment. The governance plans also defined ongoing monitoring plans and the training needed to manage AI risks.

The effort resulted in an agile and targeted operating model to manage AI adoption in a responsible manner with appropriate governance and controls, as well as an increased understanding of how AI applications can generate outcomes devoid of business context when left unchecked.

Perhaps even more important, the company was able to use the risk mitigation initiative to make AI more human, employing people to keep watch on the AI algorithms and ensure that the learning behind each AI model was transparent and that guardrails and accountability existed if and when an AI model produced unexpected outcomes.

Action 3

Orchestrate tech and talent



Technology and talent acquisition come together in the era of AI

One of the major changes that AI presents to any organization is the need to plan technology and talent investments in tandem, looking at each as a source of critical skill sets—a unified human with machine workforce.

Across all stages of maturity, assembling the technology and talent required to build, scale and innovate with enterprise AI is an evolving challenge. The shortage of skilled AI talent in particular has been well documented.⁷ Fortunately, over the last few years, many successful AI models and training sets have made their way into commercially available software and open-source offerings that can help jump-start efforts and mitigate effects of the talent shortage. However, the ability for an organization to achieve differentiated tools and applications with AI still hinges in large part on the talent it is able to bring in-house.

This appears to drive a pattern as organizations mature: For an organization early in its AI journey, it will likely need to hire externally to get a baseline of AI talent that can then: help train existing in-house personnel, and help build more differentiated technology, as well as evaluate, partner with, and implement ecosystem solutions and alliances more successfully. Given that even the most advanced organizations are still early in their AI transformations, a majority of surveyed organizations reported they still prioritize bringing new AI talent into the business from outside, rather than retraining existing workers. Companies with fewer years of AI experience tend to rely

more on external partners and, over time, shift to acquiring smaller companies with skilled workforces as they better define needs.

Consistent with this, it appears a significant majority of the survey respondents acquire AI as a product or service (65%)—rather than attempting to build their own AI solutions in-house (35%)—leaning particularly on off-the-shelf solutions at the beginning of their journeys. Co-development also remains a common practice for AI solutions, with organizations teaming up with their vendors to create customized systems and processes. Since AI is still an emerging technology, many vendors continue to offer kit-like platforms rather than fully baked solutions.

While early entrants may have found implementing off-the-shelf solutions was sufficient to differentiate themselves five years ago, the increasing maturity of the market is spurring some organizations to develop and train more customized in-house solutions that offer greater differentiation. Survey data bore this out: Organizations with more years of AI implementation experience tend to be more likely to try building their own AI solutions, while organizations with fewer years under their belt have a tendency to depend on packaged solutions.

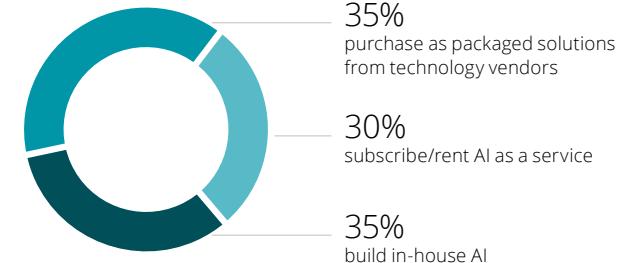
This convergence of technology and talent has opened up many questions about how these more-vertical capabilities and solutions sit within an organization. In the last two years of the survey data,

it appears there is no consensus yet on which models drive stronger outcomes. But it is an important question for organizations to consider as they scale their AI implementations.

Acquiring AI talent



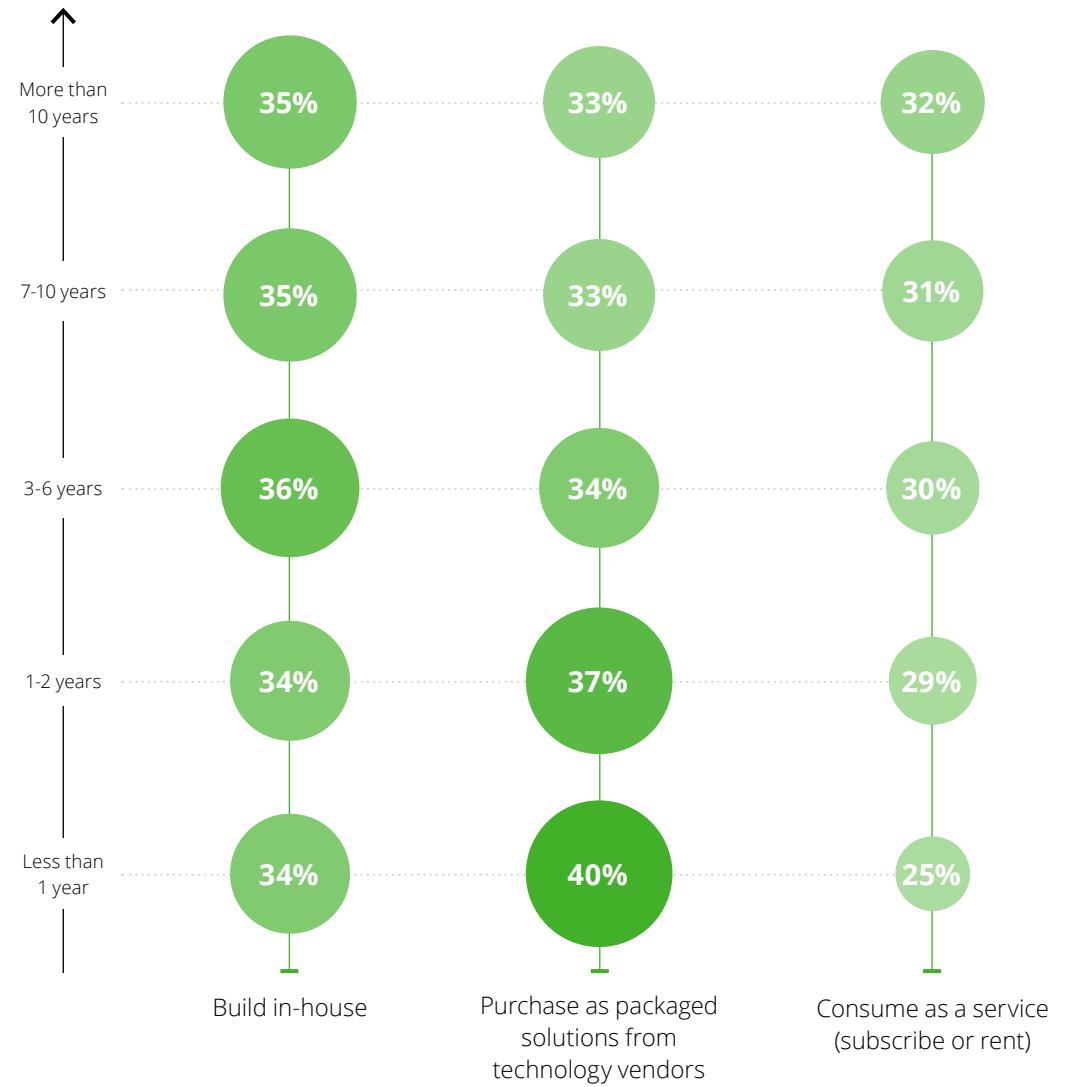
Acquiring AI solutions



"If you are just starting with AI, then of course these will be outside experts because you don't have that inside your company. Once you have the seniors who can teach others, then you can build this up within the organization as well."

- Head of machine learning
Multinational automotive parts manufacturer

How do organizations achieve AI solutions by AI experience?



*Percentages may not add to 100, owing to rounding.

N=2,620 respondents

26

“The most successful organizations I see are the ones that are investing in outside technical leadership. It has to be incentivized correctly. By investing in the outside technical leadership, you’re bringing people onboard whose domain expertise is to answer these tough [technical] questions and give realistic feedback [to nontechnical leaders].”

– General manager, AI strategy
Nonprofit academic medical center



Action 4

Select use cases that can help accelerate value



How you start your AI journey can determine where it ends

Respondent organizations are implementing AI in a wide range of domain and industry processes, and they tend to adopt use cases in a specific order. Naturally, as companies increase their AI investments they eventually address a larger and wider range of use cases, but when it comes to selecting which business processes to start with, the choices they make could set the trajectory for how quickly and to what degree they will achieve successful outcomes and gain momentum through early efforts.

Focusing on use cases that are too challenging, or have very long-term or small benefits can reduce a company's enthusiasm to invest more, stifling further innovation and slowing down the transformational changes that AI can bring. On the other hand, starting with use cases that are easier to achieve, or have a proportionally faster or higher return on investment, can create momentum for further investment and make it easier to drive internal cultural and organizational changes that can accelerate the benefits of AI.

Furthermore, the processes, practices and regulatory contexts specific to each industry have a large influence on the way that companies in different industries pursue AI investments, and the degree to which the insights from AI are integrated into decision-making. For example, those surveyed claim top use cases of AI across industries include cloud pricing optimization (44%), voice assistants, chatbots and conversational AI (41%), predictive maintenance (41%) and uptime / reliability optimization (41%). But top use cases could vary by industry. For example, 48% of technology, media and

telecommunications, 47% of life sciences and health care, and 46% energy, resources and industrials use AI for cloud pricing optimization; whereas 43% of government and public services industry uses AI for predictive maintenance; and 42% of financial services industry uses AI for voice assistants, chatbots and conversational AI.

In the following section, an introduction to each industry's most common use cases is explored. In select industries, a higher focus on AI applications that are relevant only to their industry are found, while others may focus more heavily on domain applications that can, for example, accelerate marketing or drive more efficiency across the supply chain.

Consumer

The consumer industry includes a vast array of business types, ranging from consumer products to hotels, restaurants and airlines. While they function very differently across the value drivers, all sectors are united by their focus on serving customers.

Within each sector use case adoption may shift significantly. In consumer products and manufacturing firms there appears to be a divide between smaller firms that struggle most with staff shortages and hiring skilled operators, and larger firms that struggle most with costs of inputs and managing costs across larger and more complex production processes. The former group tends to see the most success with bringing AI assistants to the shop floor in the form of virtual operator assistants, while larger firms tend to see better results from investing in AI-enabled value chain optimization to identify hidden opportunities and overlooked savings.

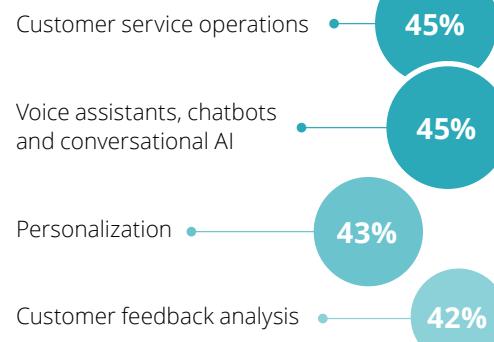
Transportation companies that focus on optimization problems such as spare parts management or fleet management (essentially cost savings) tend to underperform companies driving further investment in autonomous vehicles, the adoption of which drives larger organizational and operational changes.

In the retail sector, we observe that companies that focus on AI investments to drive top-line growth, such as AI-enabled promotion management to drive more sales, can find that they obtain lower-value transactions or potentially drive customers to expect discounts and deals. Higher-performing companies tend to start with investments in differential pricing.⁸

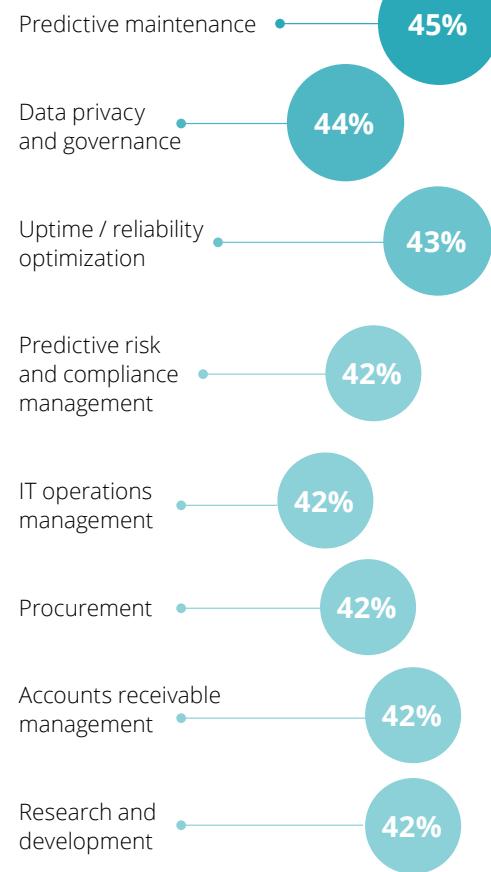
For more exploration into the near- and longer-term applications of AI across this industry, see [Deloitte's Consumer AI Dossier](#).

Processes currently using AI in operational / day-to-day use (Top 15)

Customer experience & Marketing



Operations & Finance



Workforce & HR





Action 4: Select use cases that can help accelerate value

Consumer case study⁹

A multibillion-dollar global food ingredients company needed to make better-informed pricing decisions. Account managers were making quotes solely on gut feeling and personal experience, without support from competitive information or analytic insights to improve their customer negotiations.

The company implemented an analytics pricing solution to generate price targets at the customer and product levels and deliver quantitative insights that account managers used to communicate the value of their products and services to customers. The solution also enabled what-if scenario planning to improve negotiations and profits. The company's new pricing and promotions framework generated a 2% increase in annual revenues.

Life sciences and health care (LShC)

Two years after the world was introduced to COVID-19, the recognition of AI's importance to life sciences and health care companies has become increasingly clear. There is a stronger urgency, especially among biopharmaceutical executives, to tackle the risks associated with the technology in order to innovate and gain an edge over the competition.

Data from the survey indicates that top use cases across life sciences and health care as an industry still tend to focus primarily on automating repetitive tasks and standard cross-industry business processes. This is seen across many industries, where the frequency of back-office functions rising to the top 10 is high. However, a deeper look at the individual subsectors reveals some interesting differences among the top use cases.

Within life sciences, the presence of more advanced and industry-specific use cases, such as smarter drug manufacturing, shows no signs of slowing down. AI's role within the biopharmaceutical R&D value chain manifests in the preeminent role of smart drug discovery applications.

For its part, the leading industry-specific health care AI use cases focus on outcomes and monitoring in such potentially transformational areas as AI-assisted diagnoses including predictive diagnoses, patient engagement, insurance fraud detection and smarter hospitals. Recent years have also witnessed the burgeoning role of trustworthy AI in ensuring

more equitable health care delivery outcomes. Key in this regard is in guarding against the kind of model bias that could result in unfair and inequitable health care delivery and insurance coverage, among other areas. Another recent development points to the potentially accelerating effect of the global pandemic on AI adoption within the health care sector. The pandemic highlighted how AI can help hospitals and other providers respond to a health care emergency. As a result of the pandemic, a number of leading medical schools and hospitals have recently established AI-focused departments to advance how AI can better predict and optimize the delivery of health care services under such extreme global conditions in the future.

Interestingly, in looking at both sectors, industry respondents who still find themselves in the Starters category also reported a meaningfully increased focus on use cases that are higher value, but significantly more difficult (such as research and development and computer-assisted diagnostics), relative to more AI-mature players.

This could be slowing down progress, as they may not be reaping the rewards or faster returns from use cases that may be more low-hanging fruit.

That more AI-advanced organizations rely on the technology for more *industry-agnostic* tactical cases, relatively speaking, suggests that the real payoff to AI adoption is currently in

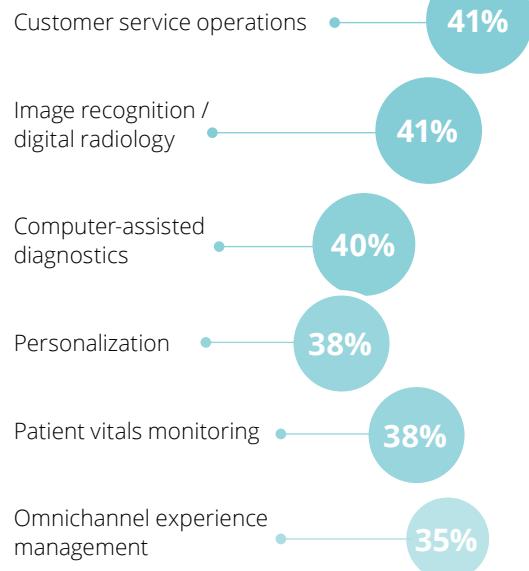
cross-industry use cases. It also may speak to some of the hurdles that *industry-specific* AI use case adoption faces within LShC.

This also speaks to how critical the decision-making process can be early in the AI maturity journey. It's important to develop an AI strategy that can achieve outcomes in a shorter time frame, while also identifying use cases that may require a steeper learning curve and a more significant time-to-value realization.¹⁰

For more exploration into the near- and longer-term applications of AI across this industry, see [Deloitte's Life Sciences and Health Care AI Dossier](#).

Processes currently using AI in operational / day-to-day use (Top 15)

Patient experience & Marketing



Operations & Finance



Workforce & HR



LSHC (N=260)



Action 4: Select use cases that can help accelerate value

Life sciences and health care case study¹¹

COVID-19 magnified the demand for health care services, as consumers have become more sensitive to how they interact with providers. Success in the health care industry increasingly means simple, seamless customer access, and a major US health care organization found itself trying to meet patient needs and deliver a superior experience to its customers. Its first challenge: to personalize interactions, efficiently coordinate care, and get patients to adhere to medications correctly. There were too many touch points that consumers needed to follow to get the care they needed, and oftentimes they were difficult to coordinate. Meanwhile, the company also needed to expand its data science and cloud data engineering capabilities to address these needs rapidly, especially as the COVID-19 pandemic increased demand for its services.

The first step to solving these challenges was to assess the current consumer and patient journey processes, data and technologies in order to understand existing gaps. Based on that information, the client was able to design and implement an end-to-end AI-enabled personalization solution using:

- Clustering techniques to identify and categorize consumers who may not have been part of the process

- Reinforcement learning to identify the proper outreach to connect with each consumer individually
- Omnichannel platforms that create inherent efficiencies by automatically routing messages to the consumer's choice of outreach (text, phone, email and more)

By implementing a new suite of AI use cases, the client now operates with enhanced personalized customer experience, improved medication adherence and a reduced cost of care. Scalable, AI-enabled personalization supports customer service, care coordination and campaign management across the organization.

AI became the engine to drive innovation throughout. Using data and insights derived from machine learning models allowed the understanding of each consumer's health care needs and the automatic determination of how, when and which content to deliver through multiple communication channels. The engagement touched about 10% of its customers, resulting in more than \$100 million in revenue.

Energy, resources and industrials (ER&I)

Energy, resources and industrials as an industry embodies a range of asset-intensive sectors, spanning from oil, gas and chemicals to utilities to industrials, heavily focused on discrete and process manufacturing. These companies have invested substantial amounts of time, money and resources over the past two decades into getting instrumentation and technologies in place and interconnected in order to accumulate operationally relevant data. This is evident by the survey results reflecting focus in IT cloud pricing and optimization of uptime and reliability for managing data, as well as the expansion of human resources with skills in data engineering. The sheer amount of structured and unstructured data (i.e., video / surveillance, machine control systems) streaming into disparate data platforms continues to grow exponentially—leaving ER&I companies to face new challenges in obtaining and delivering human-accessible insight from their vast amounts of accumulated disparate data to make better, more informed decisions.

Our survey shows that while the digital and data foundation for ER&I is ripe for AI, the operational models for harnessing AI technology have not yet made inroads into ER&I compared with respondents in other industries. Current applications by respondents of AI appear most prevalent in the back-office functions through automation and analysis, while disparate operational technology data sets remain in functional silos. Challenges to broader enterprise adoption with the core operations can be attributed to several factors, including continued challenges with data quality and centralization as well as the historical reliance on engineering principles for operational decision-making. This, by extension, highlights the

relative abundance within the industry of those who value first-principle mathematics over the less discernible insights brought by advanced analytics, machine learning or artificial intelligence. Other reasons cited by respondents for slow adoption within the industry include the cyclical focus on cost as opposed to long-term value creation, lack of organizational change management capabilities for introducing innovative AI technology, and under-developed corporate governance to account for and track the value realized from AI initiatives.

Trust in AI for critical decision-making is expected to continue to mature in ER&I as organizational capabilities mature. The high degree of emphasis on safety and reliability across ER&I necessitates that validation and caution be applied to all new technologies, especially those which alter human interactions with equipment and field assets. As organizations mature their capabilities in AI people, process and technology, trust should be continually improved with a focus on traceability and explainability of AI systems.

With the stringent regulations and geopolitical factors affecting the ER&I industry, it is important to consider reshaping and rethinking the evolving AI adoption strategies for most companies in this industry. The “value realization phase” entails using data with a focus on helping accelerate resource extraction, reduce nonproductive time or downtime, improve levels of safety, enhance revenue streams with distributed energy resources and renewable sources, and optimize fleet management and routings; and, helping to improve the automation of collecting environmental, sustainability

and governance metrics. Toward that end, enhanced AI expertise within the industry will be important to the advancement of its use, especially in many of the high-potential use cases native to the ER&I industry.

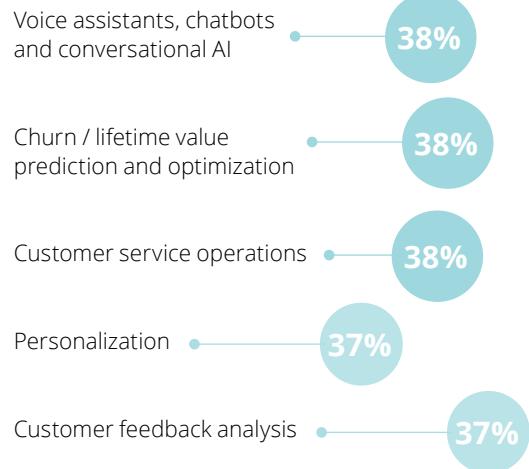
Advancement in technology from cloud infrastructure to edge computing and from IoT sensors to cybersecurity mechanisms has made the cost of availability of data cheaper and secured. By application of advanced analytics and artificial intelligence, ER&I companies can identify trends and predict events throughout processes to quickly respond to disruptions and improve efficiencies. The shift to a more digital future further helps this industry surpass human limitations, to enable the type of decision-making that helps the end-to-end value chain operate efficiently and effectively, and be continuously focused on innovation.

Industry executives seem to recognize the significant potential for the use of AI at the front lines of their asset operations. Accordingly, the survey data shows good growth in the areas of predictive maintenance, safety and process optimization, which shows the trends toward the type of prescriptive insight that other industries have used to solidify the importance of AI. This is likely a harbinger of things to come as ER&I organizations tackle some of their most challenging historical problems and leapfrog toward new thinking and aspirations.

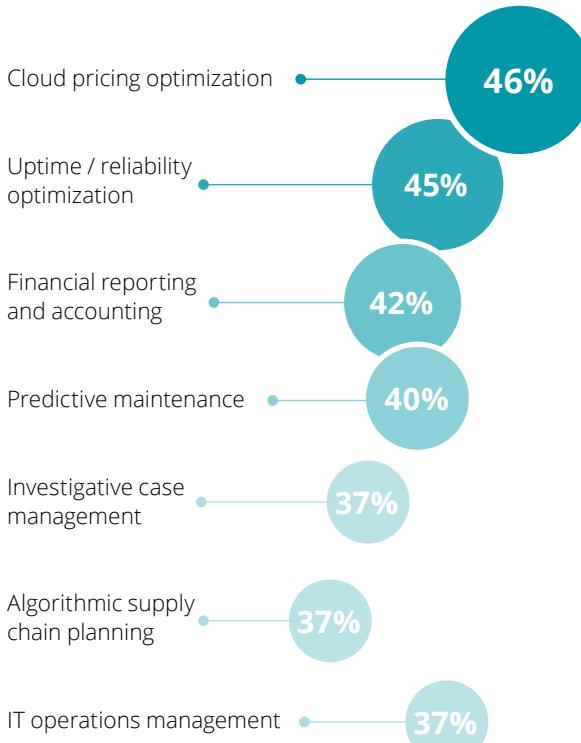
For more exploration into the near- and longer-term applications of AI across this industry, see [Deloitte's Energy & Resources AI Dossier](#).

Processes currently using AI in operational / day-to-day use (Top 15)

Customer experience & Marketing



Operations & Finance



Workforce & HR



ER&I (N=525)



Action 4: Select use cases that can help accelerate value

Energy, resources and industrials case study¹²

A large industrial products manufacturer was keen to reduce spend on warranty costs and pricing claims—with claim audits a dauntingly manual process. But more important, the company knew that buried within those claims could be potentially critical insights around quality and safety. A smart AI technology solution could provide a more comprehensive review and analysis that could better screen claims and improve end-to-end management of supplier chargeback and product quality.

How could it implement the robust analytics models needed to make it possible to review and analyze the data in a way that would yield the benefits the manufacturer sought? To most effectively dig through this mountain of data to uncover the insights the client knew were buried within, the company leveraged an AI-driven solution that performs millions of analyses and monitors warranty and pricing claims on an ongoing basis to detect quality issues or potential waste due to anomalies, policy violations or other irregularities.

As the technology identifies opportunities, it turns those insights into alerts and action plans, enabling humans to investigate and research high-risk dealers. From a user viewpoint, the technology is streamlined: It automatically ingests new data, leverages AI and specialized analytic

models, and displays insights and visuals that support workflow and management tracking. And not only was the technology itself automated, but so too was its deployment, which was implemented within the organization's environment through a fully automated production process.

Since launch, the solution has delivered a real impact on the client's business, helping to improve issue detection, process efficiency and coverage; and helping to identify potential recovery opportunities. The company now detects issues more quickly, significantly saving on warranty costs and pricing claims, and can make informed decisions for the future.

And the journey is hardly over. Additional features enable the client to further refine existing analytics and detect monitored issues more accurately, as well as extend the purview of the analyses in order to capture more areas of recovery and loss prevention. The discoveries the client has made around intelligent quality, warranty waste and pricing claims have also helped drive behavior change at the dealer and distributor levels, further reducing warranty spend. The solution has positively impacted how they work and has improved their efficiency.

Technology, media and telecommunications (TMT)

Technology, media and telecommunications companies seem to recognize the criticality of AI far more than any other industry—72% of respondents strongly agree that AI is very important to their ability to stay competitive over the next five years, 12 percentage points higher than any other industry.

That may come as little surprise, as the first brands that come to mind in the industry are often digital natives such as Google, Amazon¹³ and Facebook¹⁴—brands that are often considered synonymous with AI sophistication, with AI used extensively in their commercial products and services (many of which are foundational enablers across all industries). However, that's not the whole story of the industry. Some of the legacy brands within the TMT space, such as AT&T¹⁵ and Hearst,¹⁶ are also among the most significant.

Survey data indicates that telecommunications and media companies tend to be the furthest along at embracing AI, the sector with the largest proportion of Transformers (and, incidentally, also the largest number of Underachievers). This maturity is likely attributed to telecommunications' longstanding focus on operational efficiency and, for media companies, the rapid uptake of digital marketing techniques. Customer acquisition and retention efforts have also driven the development of AI capabilities for telecommunications and media

companies and are reflected in the prevalence of these use cases across all sectors.

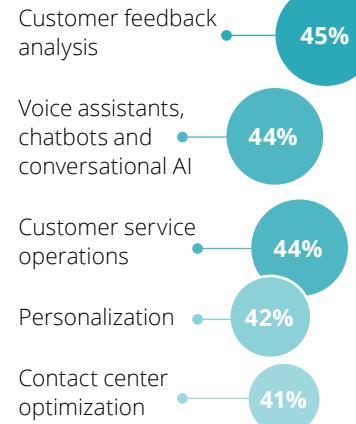
Generally, the most common AI use cases for TMT companies still focus on cross-industry business processes. Again, according to our survey, telecommunications, media and entertainment (TME) stands out slightly in its AI adoption with use cases such as video content analysis, audio and video mining, and production operations automation. External factors like a push to cloud and an increase in streaming are enablers that are encouraging this adoption. These are also growth factors in continuing to monetize such digital-first properties. TME companies still derive the most value from use cases related to back-end operations that tend to enable standard business practices.

An interesting distinction between the subsectors in this group is that TME companies seem to be better than technology companies at generating value from customer data (e.g., customer feedback analytics). This may not be surprising, given the wealth of data that TME companies tend to have about their customers compared to technology firms.¹⁷

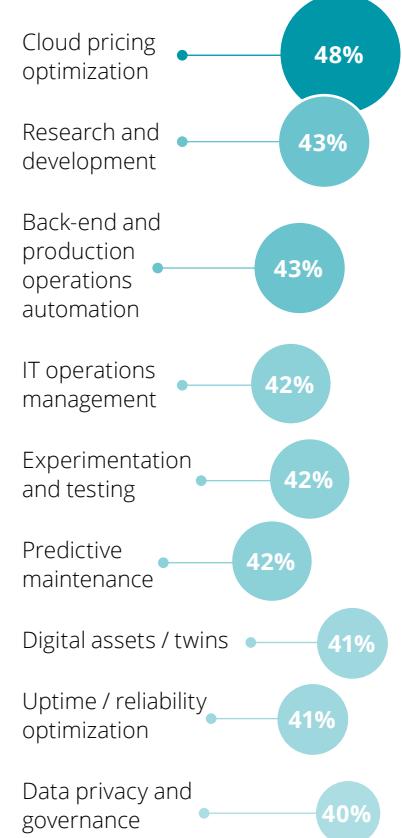
For more exploration into the near- and longer-term applications of AI across this industry, see [Deloitte's Technology, Media & Telecommunications Industry AI Dossier](#).

Processes currently using AI in operational / day-to-day use (Top 15)

Customer experience & Marketing



Operations & Finance



Workforce & HR





Action 4: Select use cases that can help accelerate value

Technology, media and telecommunications case study¹⁸

The cloud services group at a major global technology company was stuck in sourcing customer leads the old-fashioned way. And for many years this resulted in tremendous growth.

But that company growth wasn't evenly distributed—consumer products were driving most of it. Enterprise cloud services were not. Selling those meant establishing relationships, which is much harder to scale. This meant the company would need to focus its strength in data science where it could have the most impact: improving enterprise cloud sales leads.

To do this, some of the latest artificial intelligence techniques came to the fore, primarily by tapping the company's data to build a variety of machine learning models and increasing the number of considerations for qualifying a sales lead from two ... to as many as possible.

The task then became to choose and fine-tune the most effective model, then put machines to work learning patterns in the customer data. Was there a sweet spot, in terms of a buyer's title? How often

had they been contacted? Time of day? The patterns uncovered by the machines helped the marketing team better qualify and prioritize leads. They also helped the sales team get specific on the needs they'd be addressing with each lead, as well as the speed and frequency of contact.

If fed new data, the model could also be used to predict likely outcomes. What if the cloud services team changed how a lead is initially greeted? Or explain a different product benefit? With digital heavy lifting like this happening in the background, sales reps can now focus on what they do best (and what no machine can do): make human connections.

This kind of operational efficiency has led to real results. Within six months, the company's cloud services group enjoyed an increase in its sales pipeline overall, with lead-to-opportunity conversions up 20%. Sales of cloud services increased in that same period, with no increased costs for the sales team. Marketers are contributing to growth of the sales pipeline more than previously, while the sales team is closing more deals.

Financial services (FS)

The financial services industry is experiencing significant disruption as companies navigate increasing customer expectations, shifting regulations, and rising competition from fintechs and neobanks.

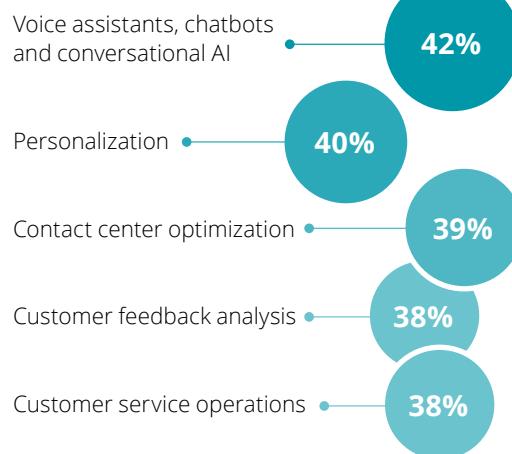
Compared to other industries surveyed, financial services companies tend to be lagging slightly in their AI maturity journey. Survey respondents came in below average in their responses to how important AI is to their organization's ability to compete in the next five years. While all organizations continue to invest in intelligent automation to reduce costs, steady progress is being made across all surveyed businesses (the most advanced being fintechs) toward differentiating themselves at scale while navigating the complex business, data, technology and regulatory landscape.

Next-generation digital customer experience and broad risk management are likely to be particularly lucrative opportunities to drive positive impact and profitable growth for the industry. In addition, natural language generation / processing and voice agents were seen as technologies that businesses particularly value in the coming years.

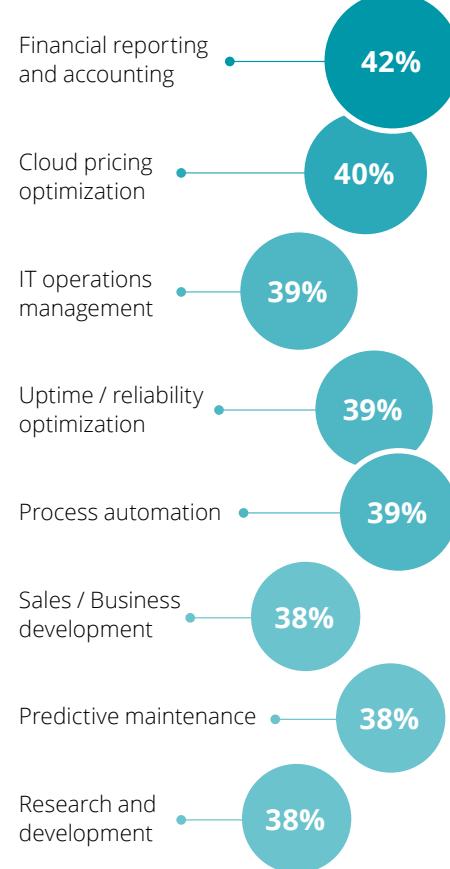
For more exploration into the near- and longer-term applications of AI across this industry, see [Deloitte's Financial Services AI Dossier](#).

Processes currently using AI in operational / day-to-day use (Top 15)

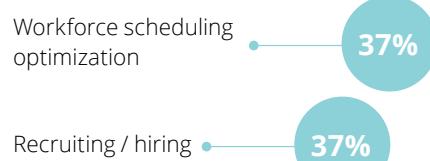
Customer experience & Marketing



Operations & Finance



Workforce & HR





Action 4: Select use cases that can help accelerate value

Financial services case study¹⁹

Like many of its peers, a US regional bank's retail marketing team relied on mass marketing certain geographic areas with direct physical mail offers. These campaigns yielded poor ROI due to low sign-up rates and a lack of personalization in campaign product offers. This approach failed to use customer-specific data to decide which customers receive offers, and the limited geographic reach missed other potentially high-propensity customers.

The client's marketing team wanted to enrich its existing customer data to improve the campaign sign-up rates, which could lead to lower campaign costs and higher ROI. The client's existing customer data provided an adequate picture of the customer interactions with the bank, but it failed to capture data elements that would indicate which customers were likely to sign up when receiving the campaign mailer. By building a campaign engine using third-party data that captured customer behaviors and attitudes, the team became able to target fewer customers with direct-mail offers while maintaining its total acquisition numbers. Alternatively, the team now has the opportunity to better target more customers at higher conversion rates.

The team was able to use all third-party data to accelerate the development of an AI-based propensity model to identify and better target new customers and improve conversion rates. The model was able to leverage data from multiple aspects of a customer's life such as spending behaviors at local retailers, property values and levels of physical activity. Furthermore, the final model only used a small subset of the 1,000 customizable features that can be adapted in the future to improve campaign performance for different products and geographies.

The bank now has a tool that has quickly improved its ability to target and personalize offers to customers. The effort has improved campaign effectiveness, while reducing costs, and increased organic customer growth. This, combined with additional insights into customer channel preferences, has set the stage for reimagining its in-house marketing capabilities and driving ongoing next-generation marketing transformations for continued profitable growth into the future.

Government and public services (GPS)

AI holds enormous potential to help government and public service agencies improve operations and help meet the needs of citizens in new ways.

Agencies within the government and public service industry vary widely in their missions—and also in their adoption of AI, both in terms of maturity and of the use cases they pursue. Across all types of organizations we surveyed—ranging from defense to health and higher education—the majority are still focusing AI efforts on back-office activities where efficiencies can be created through automation.

However, in addition to efficiency-focused efforts, some more-specific value-driving use cases are beginning to emerge within various sectors of government and higher education. Higher education institutions appear to be increasingly using AI to refine their marketing efforts, while also exploring how AI may affect and evolve teaming in the future to help students thrive in the future workplace. Health agencies are focusing AI capabilities on disease outbreak predictions.

Defense organizations, which tend to be more advanced in their experimentation and capability

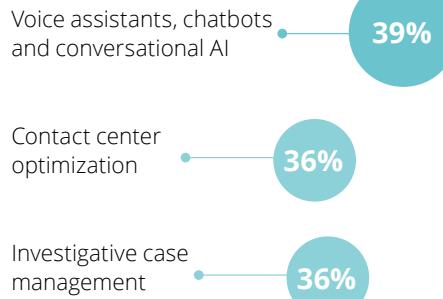
development, are driving innovations that may spread to the private sector. For example, the Air Force Research Lab has been learning via sensors and wearables how best to have pilots collaborate with new intelligent tools. Data is being used to develop algorithms that predict causes of workload stress or human error when working with smart machines, helping to predict performance and safety issues before they occur.²⁰ Lab teams also are exploring how technology can predict and assist humans before performance degrades, and what are the primary factors that most influence human-machine performance.

For some agencies there may be increased hesitancy in deploying AI, due to the high standard government agencies tend to be held to. Often more than a private company might deal with, they need to account for privacy, security and legal standards; compatibility with legacy systems; and evolving workloads.

For more exploration into the near- and longer-term applications of AI across this industry, see [Deloitte's Government and Public Services AI Dossier](#).

Processes currently using AI in operational / day-to-day use (Top 15)

Customer experience & Marketing

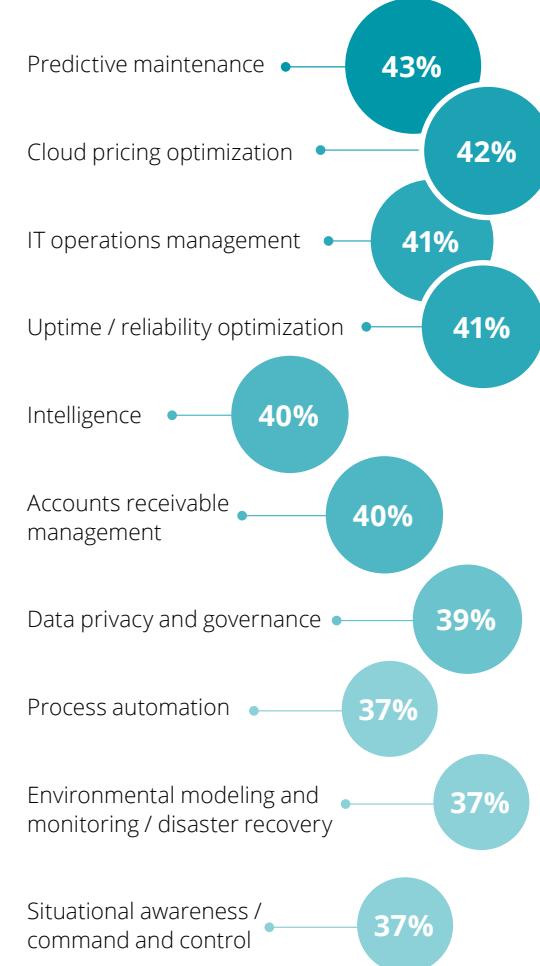


Workforce & HR



GPS (N=275)

Operations & Finance





Action 4: Select use cases that can help accelerate value

Government and public services case study²¹

In the spring of 2020, COVID-19 infection rates were rising rapidly, and hospitals were struggling to find enough beds for patients. Amid this escalating crisis, one state wanted to prioritize opening test sites and distributing personal protective equipment (PPE) to the vulnerable populations who needed it most—but it struggled to identify who they were. Getting tests and PPE to the most vulnerable was critical in the early stages of the crisis when the state was facing limited supplies and low public trust.

With limited resources, door-to-door PPE distribution and education had to take place in areas where health precautions would make the greatest impact. Selecting and launching test sites had similar challenges. Location considerations such as accessibility through public transportation, distance of travel and methods of transportation were critical.

The state's equity-driven approach required sophisticated data mapping that calculated income disparities, disease rates and other criteria to produce a clear snapshot of locations that presented the least number of hurdles to get people through the door.

To provide the insight the state needed to make these decisions, a predictive population health analytics platform was designed to identify populations most at risk of certain health conditions. It leveraged one of the largest known social determinants of

health (SDOH) databases in the United States, including all 50 states, more than 1,500 variables at the household level, and health risk models for more than 20 disease types.

Data scientists created predictive models and analyses that pinpointed areas with at-risk populations for state leaders. The data also helped inform where languages other than English were spoken in certain areas—information necessary to translate and distribute education materials. Using advanced geospatial analytics, the platform also recommended testing locations where the driving distance for residents most affected by COVID-19 was 10 minutes or less.

Results came fast. State officials received insights in a few hours instead of weeks, expediting data-driven decision-making. The faster decisions could be made, the greater the number of vaccinations that could be distributed to vulnerable populations and help slow the spread of the virus.

The new data-driven “equity lens” helped the state formalize a long-term emergency management plan designed to close the gap to public health access. A first-of-its-kind public dashboard was developed to highlight the state’s efforts to equitably distribute resources and services, and inspire state and local leaders to advance equity across key social factors such as housing, income, education, broadband access and unemployment.

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The Deloitte AI Institute helps organizations connect all the different dimensions of the robust, highly dynamic and rapidly evolving AI ecosystem. The AI Institute leads conversations on applied AI innovation across industries, using cutting-edge insights to promote human-machine collaboration in the Age of With™.

The Deloitte AI Institute aims to promote dialogue about and development of artificial intelligence, stimulate innovation, and examine challenges to AI implementation and ways to address them. The AI Institute collaborates with an ecosystem composed of academic research groups, startups, entrepreneurs, innovators, mature AI product leaders and AI visionaries to explore key areas of artificial intelligence including risks, policies, ethics, future of work and talent, and applied AI use cases. Combined with Deloitte's deep knowledge and experience in artificial intelligence applications, the institute helps make sense of this complex ecosystem and, as a result, delivers impactful perspectives to help organizations succeed by making informed AI decisions.

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Methodology



Methodology

To obtain a global view of how AI is transforming organizations, Deloitte surveyed 2,620 global business leaders between April and May 2022. Thirteen countries were represented: Australia (100 respondents), Brazil (115 respondents), Canada (175 respondents), China (200 respondents), France (130 respondents), Germany (150 respondents), India (200 respondents), Israel (75 respondents), Japan (100 respondents), Singapore (100 respondents), South Africa (75 respondents), the United Kingdom (200 respondents), and the United States (1,000 respondents).

All participating companies have adopted AI technologies and are AI users. Respondents were required to meet one of the following criteria: responsible for AI technology spending or approval of AI investments, developing AI technology strategies, managing or overseeing AI technology implementation, serving as an AI technology subject matter specialist, or making or influencing decisions around AI technology.

To complement the blind survey, Deloitte conducted qualitative telephone interviews with 15 AI specialists from various industries.

Analysis model: In line with last year's report, we developed an analysis model defining four profiles of organizations based on the frequency of full-scale AI deployments and the outcomes achieved through AI initiatives. For full-scale AI deployments, we calculated the cumulative frequency of respondents who selected "deployed" (achieved at least one full-scale deployment) among the 0–14 types of AI applications. Similarly, we calculated cumulative frequency by counting the number of outcomes achieved to a "high degree" among the 0–19 potential outcomes achieved by respondents. This established the following profile groups of respondents:

- Transformers (27%, N=707) have achieved five or more high full-scale AI deployments and at least five outcomes to a high degree in their AI initiatives. They are considered the leader group, the most "AI-fueled," within our survey respondents.
- Pathseekers (24%, N=616) have achieved fewer than five high full-scale AI deployments but still achieved at least five outcomes to a high degree through their AI initiatives.

- Underachievers (22%, N=570) have achieved five or more high full-scale AI deployments but still achieved fewer than four outcomes to a high degree through their AI initiatives.
- Starters (28%, N=727) are still developing or exploring AI deployments and have achieved fewer than five full-scale AI deployments. They have achieved fewer than five outcomes to a high degree through their AI initiatives.

**Percentages do not add to 100, owing to rounding.*

Endnotes

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