
THE MINERAL EXPLORATION TECH REPORT
2025
VRIFY
Ipsos

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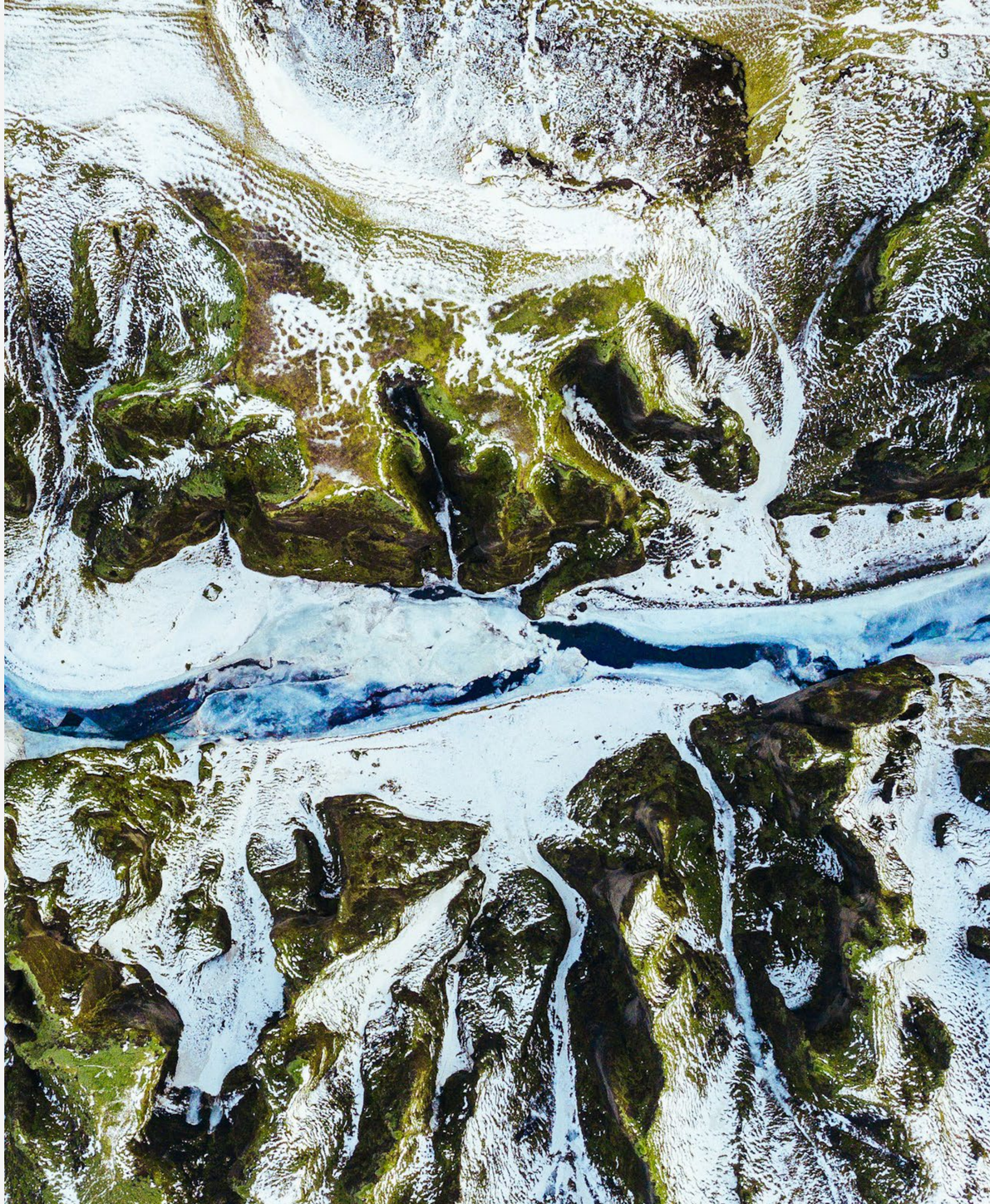

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THE WHY

THE MINERAL EXPLORATION INDUSTRY IS UNDERGOING A PROFOUND TRANSFORMATION, DRIVEN BY RAPID ADVANCES IN TECHNOLOGY — FROM ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING TO 3D VISUALIZATION AND INTEGRATED DATA PLATFORMS.

Despite the pace of change, there has been no single, credible source of truth capturing where the industry currently stands, how technology is being used, and where it is headed.

THE MINERAL EXPLORATION TECH SURVEY AND REPORT WERE CREATED TO FILL A CRITICAL GAP IN THE INDUSTRY.

The result is a credible, data-driven benchmark of how technology is being adopted in mineral exploration.

By gathering insights from self-selected professionals worldwide, the survey builds a trusted resource that can support knowledge sharing, inform strategic decisions, and strengthen the role of technology, particularly artificial intelligence, in shaping the future of mineral discovery.

THE WHY

01

Building a Trusted Industry Resource

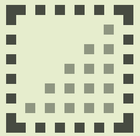
The goal is to establish an industry-standard, data-driven report that provides transparency into technology adoption, usage patterns, and perceptions across the sector. By partnering with global market research firm Ipsos and industry expert Marina Baslina, we ensure that the results are independent and credible, while being as representative as possible. This gives key industry players and stakeholders a foundation for benchmarking, planning, and decision-making.

02

Empowering Innovation and Knowledge Sharing

Technology has the potential to accelerate discoveries, reduce costs, and improve sustainability in mineral exploration. But this can only happen if we understand the barriers standing in the way and the potential of the opportunities ahead. This survey and report are about more than just collecting data; they are about creating a resource that helps the industry learn from itself, share insights openly, and push innovation forward together.

03



A Collective Effort for Collective Progress

The insights gathered through this survey do not belong to any one company; they belong to the industry as a whole. By participating, geoscientists, exploration managers, executives, and innovation leaders help create a shared touchstone to guide future strategy, attract investment, and inspire greater adoption of technologies that may define the next era of discovery.

GEOLOGY NEEDS TO LEAD THE WAY.”

– SURVEY RESPONDENT

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THE DETAILS

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HOW WE PARTNERED WITH BOTH KEY PARTIES

01

Ipsos

- Collaborated on survey design
- Advised on best practices for soliciting the strongest, most unbiased results
- Implemented the survey portal and collected data via their proprietary platform
- Collated anonymous data and provided resulting data tables
- Prepared an internal report highlighting overall trends

02

Marina Baslina

- Collaborated on survey design
- Advised on industry specificity and trends
- Supported survey distribution
- Supported analysis of resulting survey responses
- Collaborated on the preparation of this report

OUR COLLABORATORS

To bring The Mineral Exploration Tech Survey and Report to life, we partnered with Ipsos, a global leader in market research, and Marina Baslina, a mineral exploration and technology consultant. Together, these partnerships allowed us to create a well-balanced and objective survey in order to garner comprehensive and impactful findings. Ipsos's empirical research and Marina Baslina's strategic insight complemented one another, providing both depth and breadth to our understanding of the market. Our goal was to bring together these expert sources to create a well-rounded resource for the mineral exploration industry.

These partnerships allowed us to create a well-balanced and objective survey in order to garner the most impactful findings.

METHODOLOGY AND DESIGN

The 2025 Mineral Exploration Tech Survey was conducted online by Ipsos on behalf of VRIFY between August 7 and 24, 2025, for a total of 18 days, gathering insights from 135 professionals directly involved in mineral exploration strategy and in shaping the technologies their organizations use. These participants reflected a broad cross-section of the industry, spanning organizational and technical leadership and field practitioners through to board members and investor relations professionals working across regions, settings, and geological contexts, and representing companies ranging from early-stage startups to major corporations. This English-language survey aimed to understand how artificial intelligence (AI)/machine learning (ML) tools and other technologies are becoming part of exploration, tracing their influence from early trials through funding decisions and into the practical routines of geoscientists and managers. The findings are based on self-reported data, and percentages may not always total exactly 100% because of rounding or questions that allow for multiple answers to be selected.

SURVEY DISTRIBUTION

Respondents were recruited through the following methods:

1. Direct outreach, including email and text message
2. LinkedIn promotion (paid and organic)
3. Industry promotion and distribution, through channels such as email newsletters and social-media platforms

THE FINE PRINT

- The survey drew on 135 anonymous, self-selected respondents, for whose participation no incentives were offered. All responses are reported in aggregate.
- The resulting report is best viewed as a structured snapshot of the perspectives and experiences of this particular respondent group, and as a prompt for further investigation, rather than as a statistically conclusive picture of the industry. In terms of the sample and data:
  - Respondents were not recruited through probability sampling, thus the findings are not statistically representative of the mineral exploration industry as a whole and conventional margins of error do not apply.
  - Subgroup analysis, including crosstabulated results by company size and role, often relies on relatively small base sizes. Statistical significance testing is limited in these cases, and any differences highlighted between groups should be treated as directional rather than definitive, as they may reflect sample variation instead of true underlying effects. No quotas or weighting are applied to balance responses across segments, and therefore some groups are more heavily represented than others.

GLOSSARY

AI
Artificial intelligence

ML
Machine learning

AI/ML
Artificial intelligence or machine learning

GIS
Geographic information system

IoT
Internet of Things

ROI
Return on investment

EXECUTIVE
Chief Executive Officer
Chief Operating Officer
Vice President Exploration

TECHNICAL LEAD
Chief Geologist
Head of Exploration
Exploration Lead

FUNCTIONAL SPECIALIST
Geologist
Data Scientist
Geophysicist
GIS Specialist

SMALL COMPANY
Organization with 1–50 employees

MID-SIZED COMPANY
Organization with 51–1,000 employees

LARGE COMPANY
Organization with more than 1,000 employees

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AT A GLANCE

WHAT THE DATA TELLS US

The following data is a snapshot of AI/ML adoption in mineral exploration, summarizing responses from 135 qualified industry professionals.

PRIORITIES

Just under 40% cite AI mineral targeting, database upgrades, or collaborative cloud-based geoscience tools as top near-term focuses when it comes to technology.

SKEPTICISM

46%

identify geologists as the most skeptical group toward AI/ML tools, followed by field or site managers **(34%)** and then executives **(29%)**.

EXPERIENCE WITH AI/ML

56%

use AI/ML tools at least occasionally, **21% most of the time, 10% never.**

BUDGET

Budget Allocation Percentage to AI/ML

ROLES

78%

work in roles involving AI/ML tools.

WHAT THE DATA TELLS US

DRIVERS OF ADOPTION

60%

point to peer case studies as the most persuasive way to drive AI/ML usage.

ADOPTION TIMELINE

33%

began using AI/ML over two years ago, while **27%** began using AI/ML within the last year.

DECISION AUTHORITY

48%

report executives hold final adoption authority.

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THE RESPONDENTS

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WHO WE HEARD FROM

The survey drew on responses from 135 mineral exploration and mining professionals whose work spans everything from strategy to day-to-day exploration. Key highlights can be found below.

Role

Executives formed the largest share of respondents (41%), followed by technical leads (27%), and functional specialists (25%), with only a small number identifying as board members or other roles.

Company Size

Smaller operations were prominent: More than a third of responses came from teams of 1–10 employees and a quarter from those of 11–50 employees, while roughly one in five worked at organizations with over 1,000 members.

Company Focus

Junior explorers represented the largest organizational group at 36%, with consultants, miners of various scales, technology vendors, and junior developers making up most of the rest.

Commodity

Gold was the most common single focus (36%). Just under three in ten worked across several commodities (27%), and 21% concentrated on copper, while only a handful mentioned lithium, silver, or nickel.

Region

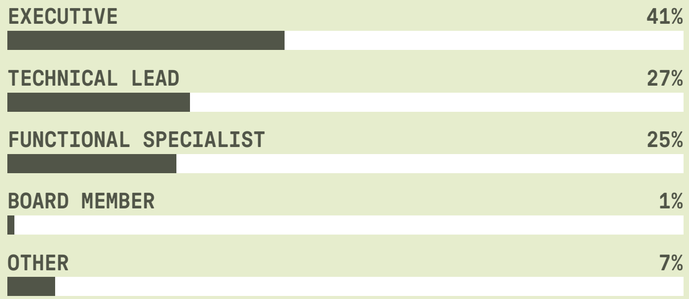
North America was home to most respondents (58%) and also their main exploration ground (34%), though many reported activity in Latin America, Oceania, Africa, Europe, Asia, or on a global scale.

Interpretation of Survey Sample

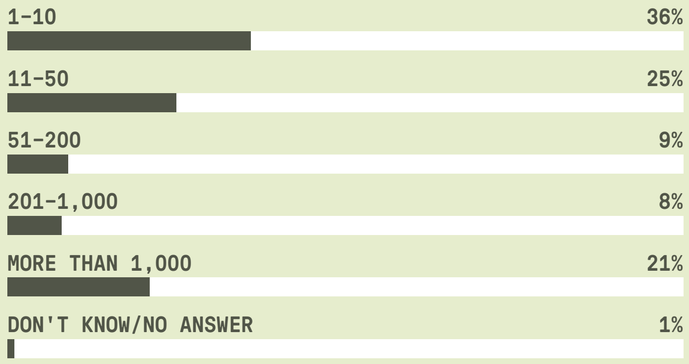
The composition of the survey sample indicates that responses likely reflect those who are involved in shaping exploration decisions and strategy, with many from junior or mid-sized operators. Their perspectives may emphasize efficiency and faster targeting. Gold’s prominence fits its status as a leading exploration commodity, while copper’s share aligns with its growing role in supply chains tied to electrification and the green energy transition. The sizable group spanning several commodities hints at demand for tools that work across varied geological contexts and datasets. Regional breadth reduces the chance of a North American–centric view.

WHO WE HEARD FROM

Role

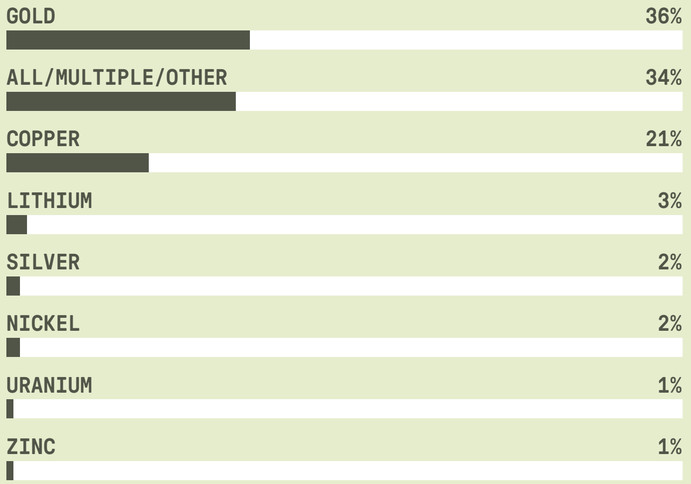


Organization Size (Employees)

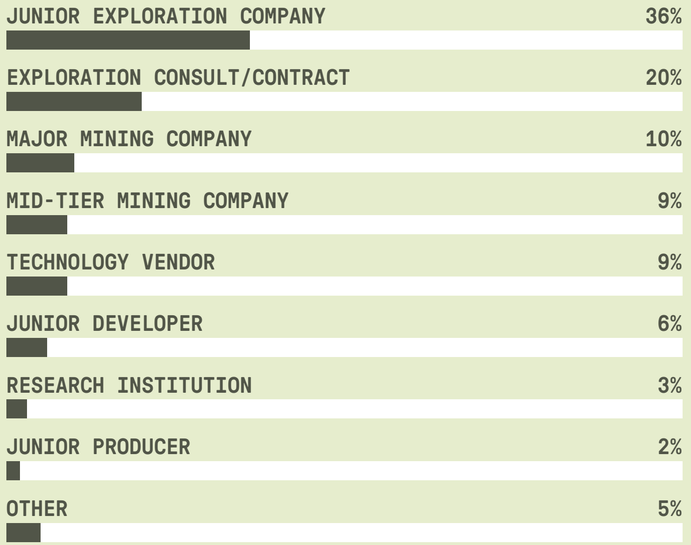


NOTE: TOTALS MAY NOT EQUAL 100% DUE TO ROUNDING.

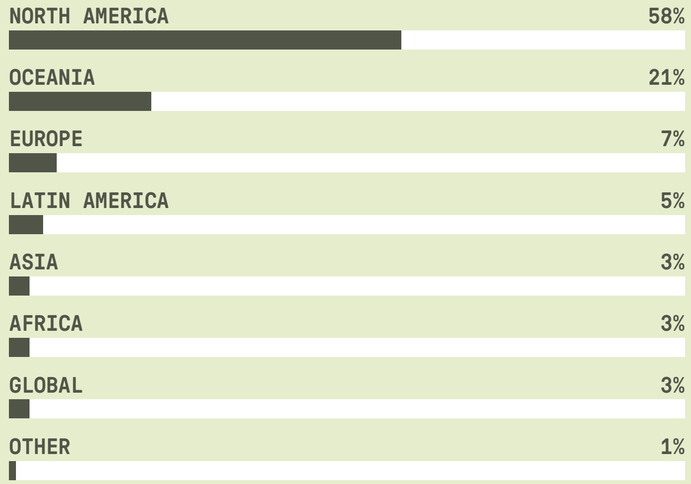
Primary Commodity Focus



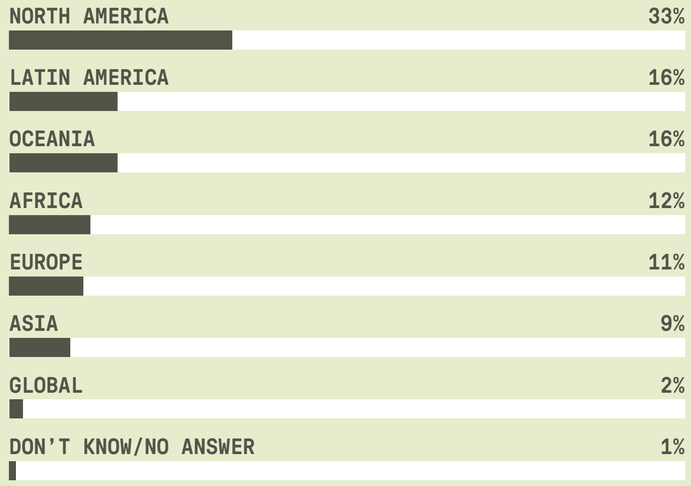
Organization Type



Headquarters Region



Jurisdiction Focus*



*MULTIPLE SELECTIONS PERMITTED FOR EACH RESPONDENT.

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KEY THEMES

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EXECUTIVE SUMMARY

The following section encapsulates analysis and takeaways gleaned from crosstabulated data with the goal of further investigating how multiple factors might collectively shape opinions.

This approach helps surface patterns that may not be visible in the aggregate data alone (see the In-Depth Analysis section), providing a more nuanced view of where alignment, friction, and opportunity may exist across the industry.

A HIGH-LEVEL SUMMARY

01 **The Impact of Size**

Company size influences AI/ML readiness, with mid-sized organizations potentially exhibiting more favourable conditions that support the adoption and operationalization of new technology.

02 **The Effect of Role**

Attitudes toward, and usage of, AI/ML appear to differ by role, reflecting how responsibility and proximity to the work influence perceived value and risk.

03 **The Influence of Organizational Culture**

A gap often exists between an organization's stated commitment to innovation and its structural ability to embed and sustain it.

04 **The Reality of Perception**

Companies frequently view themselves as adapting faster than the broader industry, potentially creating a gap that may limit shared learning and collective progress.

METHODOLOGY NOTE

The following section presents thematic analysis derived from crosstabulated survey data. Alongside the total sample being relatively small (n = 135), sample sizes vary markedly across respondent subsets, meaning the observed trends and differences within and between groups may not be statistically significant and should be interpreted with caution. The themes, patterns, and insights described are interpretations intended to highlight potential trends rather than definitive conclusions. These findings are best viewed as indicative of the perspectives and experiences of this respondent group and may benefit from further validation before being applied more broadly.

01 THE IMPACT OF SIZE

HOW COMPANY SIZE INFLUENCES ADOPTION, BARRIERS, AND OUTCOMES

SECTION

A

Scale Matters: Adoption

SECTION

B

Different Sizes, Different Obstacles: Barriers

SECTION

C

The Efficiency Quotient: Outcomes

NOTE

Though the whole survey sample size is n = 135, for this section we are using n = 134 due to one respondent not selecting company size, which is the main criterion used in analysis in this section. Within this, the 11–50 employee group (n = 12) and the 51–200 employee group (n = 11) have particularly small base sizes, so differences for these segments are more sensitive to individual responses than for the other company sizes.

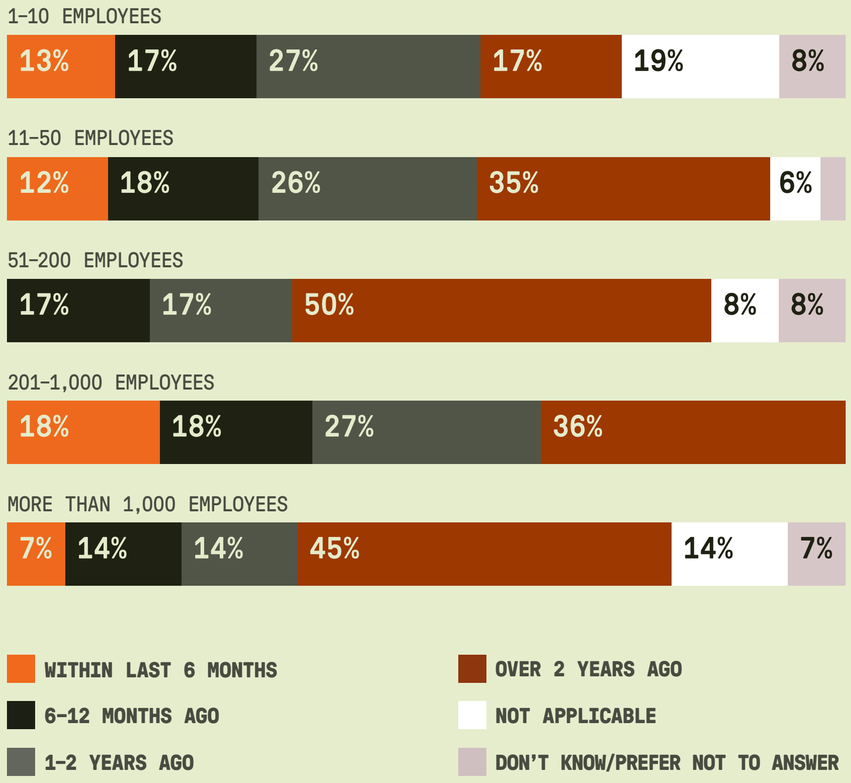
SCALE MATTERS

ADOPTION

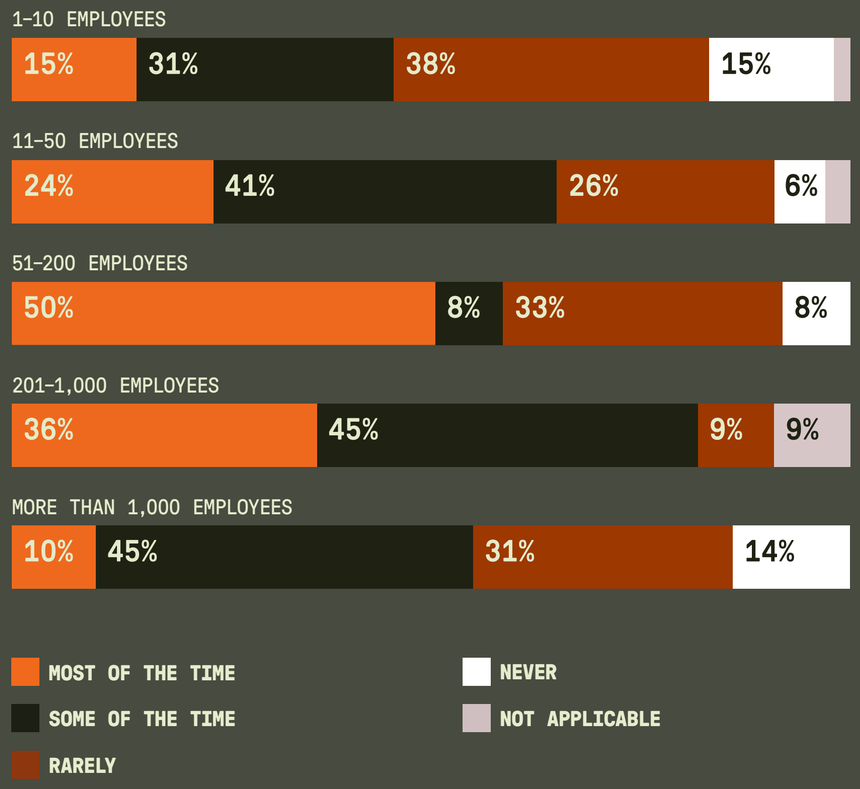
AT A GLANCE

Company size may be a determinant of AI/ML adoption and usage. Mid-sized organizations (51–1,000 employees) often demonstrate the strongest, most sustained, and most widespread AI uptake, suggesting they may operate in a “sweet spot” of resources and agility. While companies with 11–50 employees also show promising signals, smaller firms (1–10 employees) may lack capacity to adopt AI/ML and the largest enterprises may struggle to scale beyond isolated pilot programs. These dynamics suggest that mid-sized companies may be well-placed to lead the industry in practical, day-to-day integration and adoption of AI/ML tools.

AI/ML Adoption Timeline by Company Size



AI/ML Usage by Company Size



SCALE MATTERS

ADOPTION

ANALYSIS

Among respondents who select “Not applicable” when it comes to the time of initial AI/ML adoption — suggesting they are likely not using AI/ML at all — the highest proportions come from the smallest companies (1–10 employees) and the largest enterprises (1,000+ employees), at 19% and 14%, respectively.

Conversely, companies with 51–200 employees have the most responses indicating longer-term adoption (50% indicated over two years ago), while companies with 201–1,000 employees are the only group with zero “Not applicable” responses, suggesting that mid-sized companies (51–1,000 employees) are potentially operating in a sweet spot for AI/ML adoption. That said, companies with 11–50 employees also show strong adoption with 35% of respondents indicating they started using AI/ML at least two years ago.

This distribution reveals an emerging split in AI/ML readiness across company sizes. The lowest adoption rates appear at the extremes: The smallest teams may lack the resources or capacity to implement these tools, while the largest enterprises may be constrained by legacy systems or slower-moving organizational structures. In contrast, mid-sized companies (51–1,000 employees) stand out as the most uniformly engaged in their AI/ML adoption timelines. This points to mid-sized organizations potentially leading in practical, organization-wide AI/ML uptake, with smaller companies outside of the start-up space (11–50 employees) indicating strong signals, too.

SCALE MATTERS

ADOPTION

ANALYSIS

For the largest companies (1,000+ employees), there is an interesting divide: Although they report one of the higher proportions of “Not applicable” responses when it comes to adoption timelines, they also show the second-highest rate of using AI/ML for over two years (45%). This could be explained by the fact that AI/ML adoption in large enterprises begins, in many cases, within isolated innovation teams or pilot programs, while company-wide rollout is often slowed by a myriad of factors, including procurement processes, compliance requirements, risk management, and other considerations, leading to patchy uptake even when adoption began relatively early.

The smallest companies (1–10 employees) show the lowest proportion of entrenched adoption (usage for over two years, 17%), which may reflect that many companies of this size are themselves younger than two years, or that smaller teams are less likely to prioritize or invest early in unfamiliar tools without clear, immediate returns.

When examining how frequently AI/ML tools are used across organizations of different sizes, a reinforcing trend emerges for companies in the 201–1,000 employee range. Although a higher level of “Most of the time” usage is reported by companies with 51–200 employees, the 201–1,000 employee segment is the only one with zero responses indicating they “Never” use AI/ML in their exploration projects. Despite differences in AI/ML usage trends across the two mid-sized segments, both show higher rates of “Most of the time” usage (50% and 36% for 51–200 and 201–1,000 employee companies, respectively) than the other groups, illustrating another theme for organizations of this scale. In contrast, both the smallest (1–10 employees) and largest (1,000+ employees) companies show the highest proportions of “Never” responses, underscoring earlier themes of limited capacity at small firms and concentrated, pilot-style adoption within large enterprises. Once again, the 11–50 employee companies show promising signals with over 65% of respondents noting they use AI/ML tools at least “Some of the time.”

However, a noteworthy outlier (though based on a small set of respondents) appears within the 51–200 employee group, which reports the highest share of “Most of the time” AI/ML usage at 50%. Unlike the 201–1,000 segment, this group shows significant inconsistency: More than 40% say they “Rarely” or “Never” use AI/ML tools in exploration projects, compared to only 9% indicating “Rarely” in the 201–1,000 range (no “Never” responses recorded). This could be indicative of the high-growth and transitional state of companies with 51–200 employees, where they are large enough to have early AI/ML champions but not yet so structured as to standardize adoption and daily usage.

DIFFERENT SIZES, DIFFERENT OBSTACLES

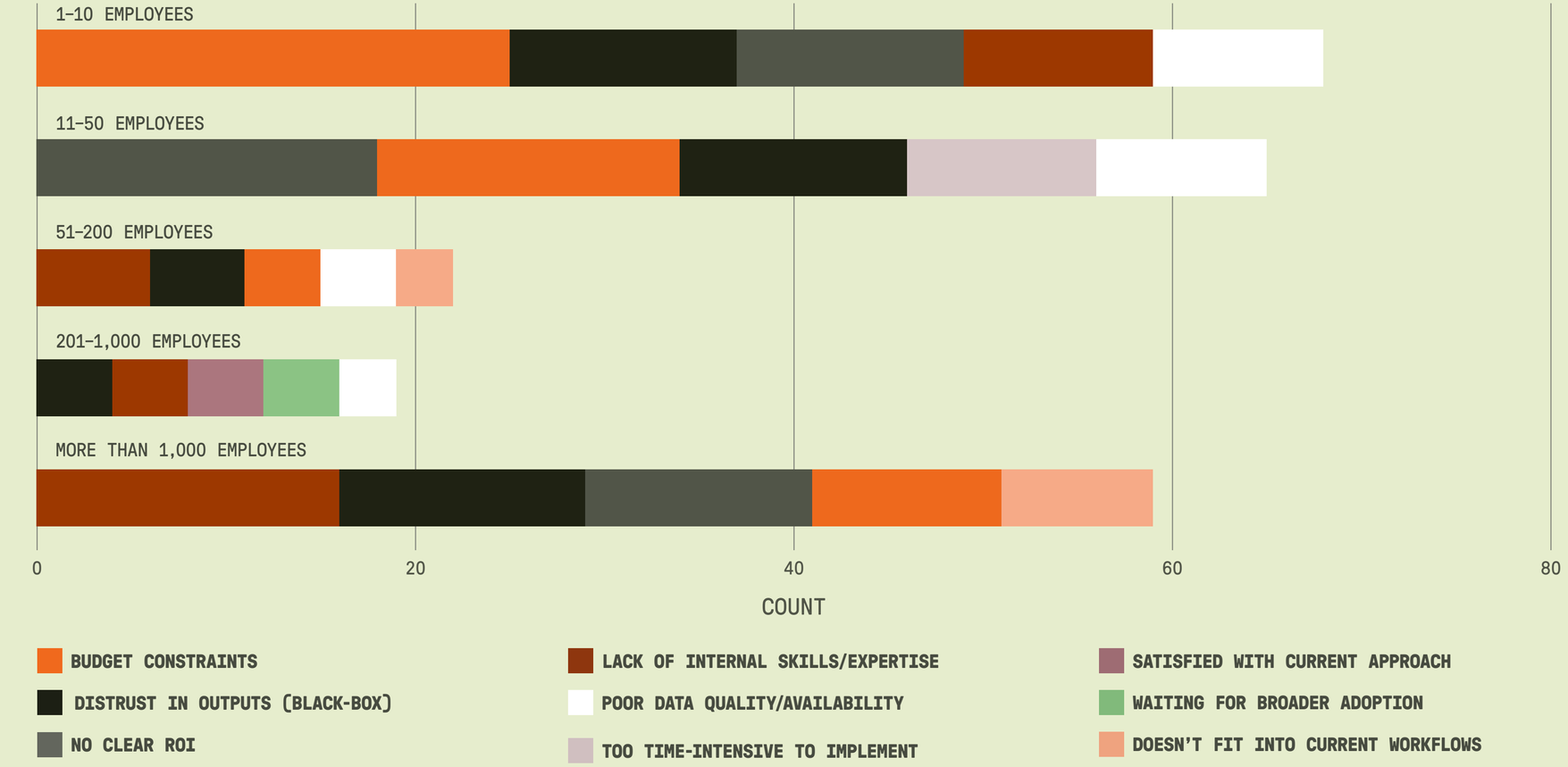
BARRIERS

AT A GLANCE

Barriers to AI/ML adoption shift as organizations grow in size. The smallest companies (1–10 employees) feel the strongest financial pressure, while larger teams become more concerned with skills, capacity, and complexity of fitting new tools into existing systems. Across all groups, “Distrust in outputs (black-box)” appears to be a top barrier, pointing to the need for more transparent tools and better education. The 201–1,000 employee group is the only one to highlight both “Waiting for broader adoption” and “Satisfied with current approach,” which suggests they often sit between being agile and being able to absorb higher levels of risk.

NOTE

This analysis focuses on the top five barriers identified for each company size. The original question included more than ten potential barriers, so while some barriers do not appear in the top-five view, they may still have been selected as lower-priority factors. As a result, this should be interpreted as a snapshot rather than a comprehensive assessment of all barriers.



DIFFERENT SIZES, DIFFERENT OBSTACLES

BARRIERS

ANALYSIS

The five leading barriers in each size group capture the issues that carry the greatest weight within that segment. While many additional barriers appear across all groups at similar levels, the top-five distribution helps highlight how priorities shift with organizational size.

Companies in the 1–10 employee range place the greatest weight on financial considerations when evaluating AI/ML tools. Budget constraints sit clearly at the top, and questions around return on investment (ROI) add to the financial pressure that defines this group. Distrust in AI/ML outputs holds the same position as the ROI concern but reflects hesitation about the technology itself rather than its cost. Skills-related limitations and data issues appear further down the ranking, which indicates that capability has some influence but does not outweigh the immediate need to manage spending and justify investment.

Among organizations with 11–50 employees, financial considerations continue to guide how teams assess AI/ML. ROI becomes the most prominent concern for this group, followed by cost, which indicates that value and spending remain central questions even as organizations grow beyond the startup scale. Distrust in AI/ML outputs still plays a noticeable role, with implementation and data constraints having less influence as they likely tend to matter more once the stronger financial and reliability concerns are resolved.

Across the mid-sized range, organizations begin to navigate a broader mix of considerations when evaluating AI/ML. In the 51–200 employee group, capability stands out most clearly, and together with confidence in outputs, it shapes much of the hesitation. Cost and data issues remain present but hold slightly less weight, and the question of how these tools fit within existing practices carries even less influence. The picture changes as size approaches 1,000 employees, where several barriers carry comparable weight. Trust and capability remain important, and two additional factors appear in this group: satisfaction with current practices and interest in seeing wider industry uptake. These additions reflect teams working within more varied structures, where momentum comes from internal alignment rather than any single overriding barrier.

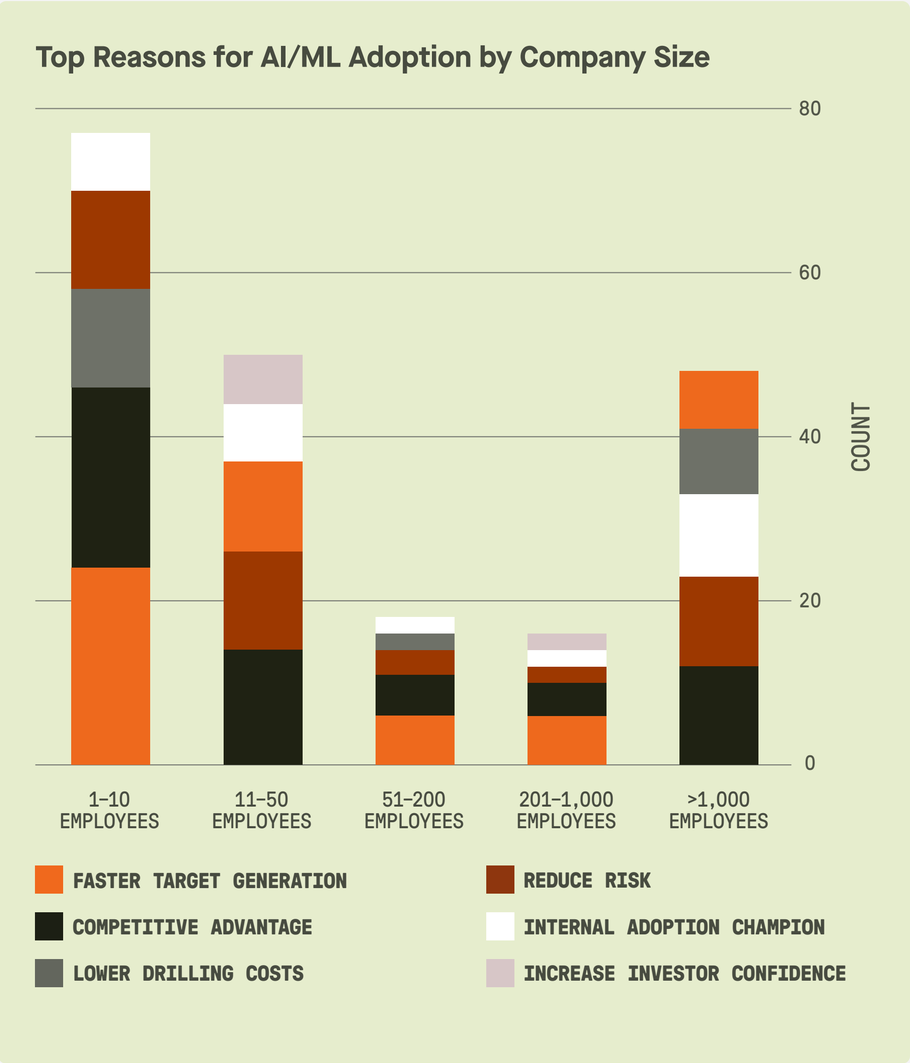
For companies with more than 1,000 employees, capability reemerges as the most influential barrier to AI/ML adoption, followed by trust and then uncertainty about value. Cost plays a somewhat reduced role here, and workflow concerns have only a modest presence. At this scale, the complexity of coordinating decisions across many functions becomes more pronounced, and adoption may depend increasingly on whether the workforce has the skills and confidence needed to apply new tools across established systems.

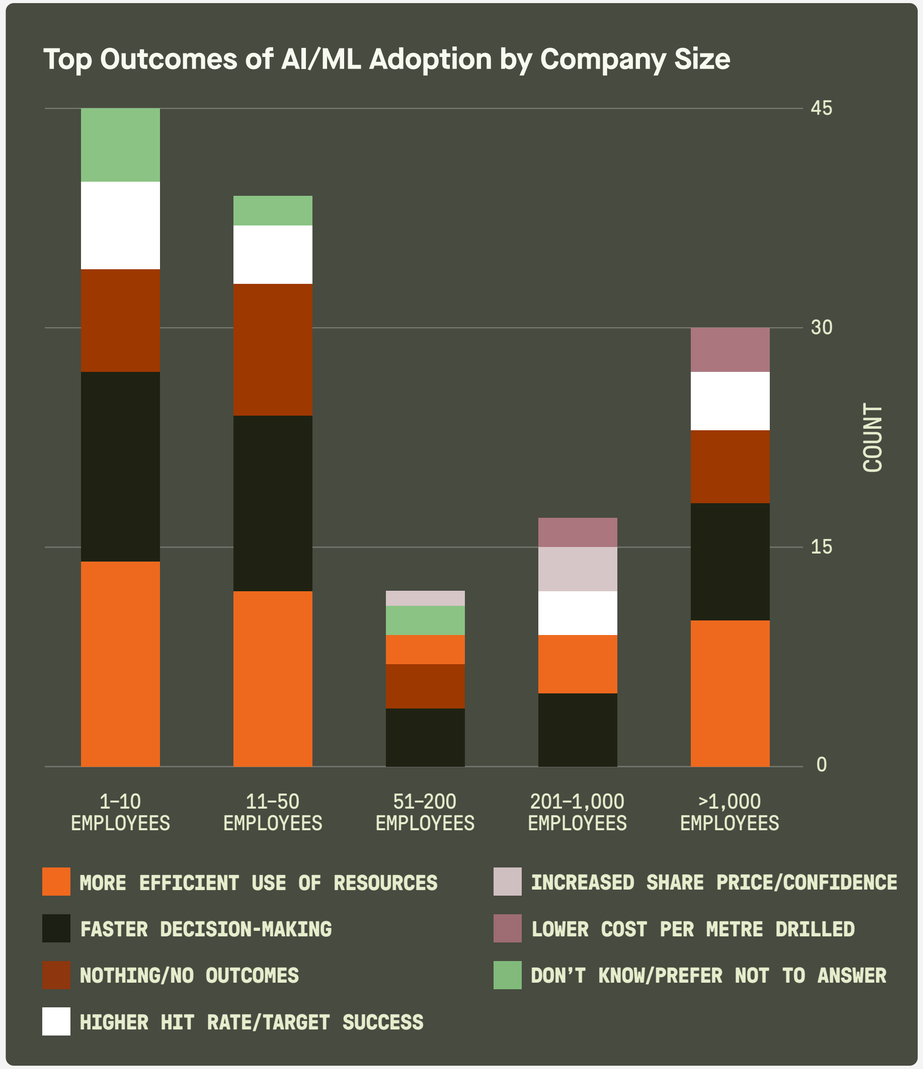
THE EFFICIENCY QUOTIENT

OUTCOMES

AT A GLANCE

Across company sizes, organizations adopt AI/ML for many of the same reasons and report broadly similar outcomes once tools are in use. They tend to hope for faster targeting, competitive advantage, exploration risk reduction, and some relief on costs. Yet the outcomes they recognize most consistently are operational: progressing projects and making decisions faster, while more efficiently using resources in day-to-day work. Smaller companies (1–10 and 11–50 employees) more often report "Nothing/No outcomes," hinting that early effects may be less apparent within compact teams. Meanwhile, changes in drilling performance or investor confidence are only mentioned occasionally, which likely reflects their longer trajectories and wider dependencies typical of those types of impacts. These trends suggest that although companies may approach AI/ML with wide-ranging ambitions, the most dependable early benefits often emerge through more streamlined routine operations.





THE EFFICIENCY QUOTIENT

OUTCOMES

ANALYSIS

Several of the top five reasons for using AI/ML are consistent across all companies. Regardless of size, most companies often point to the appeal of generating targets more quickly, strengthening their competitive position, or managing uncertainty in the early stages of exploration.

Cost considerations and the influence of internal champions also appear in multiple groups, even if they do not hold the same weight everywhere. These recurring motivations speak to the practical pressures exploration teams face when assessing whether AI/ML can help them work more effectively.

Where the groups diverge is in how strongly each reason registers. The smallest organizations (1–10 employees) lean more heavily on factors that help them move quickly or maintain a competitive foothold, which mirrors the constraints of working with limited capacity. Companies in the 11–50 employee range share some of these priorities but give more visibility to investor confidence than to cost-related factors, potentially reflecting the added scrutiny that accompanies early growth. The mid-sized groups (51–200 and 201–1,000 employees) include many of the same motivations found in smaller firms, with only modest shifts in prominence. Among the largest organizations (1,000+ employees), the patterns remain broadly aligned with the other groups, with marginally stronger emphasis on competitive positioning and risk reduction, and continued visibility for cost-related considerations and internal advocacy.

A similar pattern appears in the outcomes companies attribute to their use of AI/ML. Across all groups, improvements connected to decision-making appear most consistently, followed by better use of resources. These responses suggest that the effects teams notice earliest tend to shape how work is coordinated and how quickly decisions can be made.

The distinctions between groups come through in how confidently outcomes are identified. The smaller companies (1–10 and 11–50 employees) note operational gains but also register relatively high levels of “Nothing/No outcomes,” indicating that early shifts may be less immediately discernible in leaner teams. The 51–200 employee group shows a marked concentration of uncertainty, with “Nothing/No outcomes” and “Don’t know” ranking alongside a narrower set of benefits. In contrast, organizations in the 201–1,000 employee range differ slightly in that all of their leading outcomes describe observable improvements, suggesting clearer visibility at this scale. Among the largest firms (1,000+ employees), operational changes continue to feature, though “Nothing/No outcomes” also remains present, indicating that even well-resourced teams do not always see immediate or attributable results.

Mentions of drilling- or investor-related impacts appear across the groups but at lower levels, potentially reflecting the longer timelines or more complex conditions associated with those measures.

02 THE EFFECT OF ROLE

HOW JOB TITLE IMPACTS BARRIERS, SKEPTICISM, AND ADOPTION

SECTION

A

Common Obstacles:
Barriers & Risks

SECTION

B

Validation Required:
Skepticism

SECTION

C

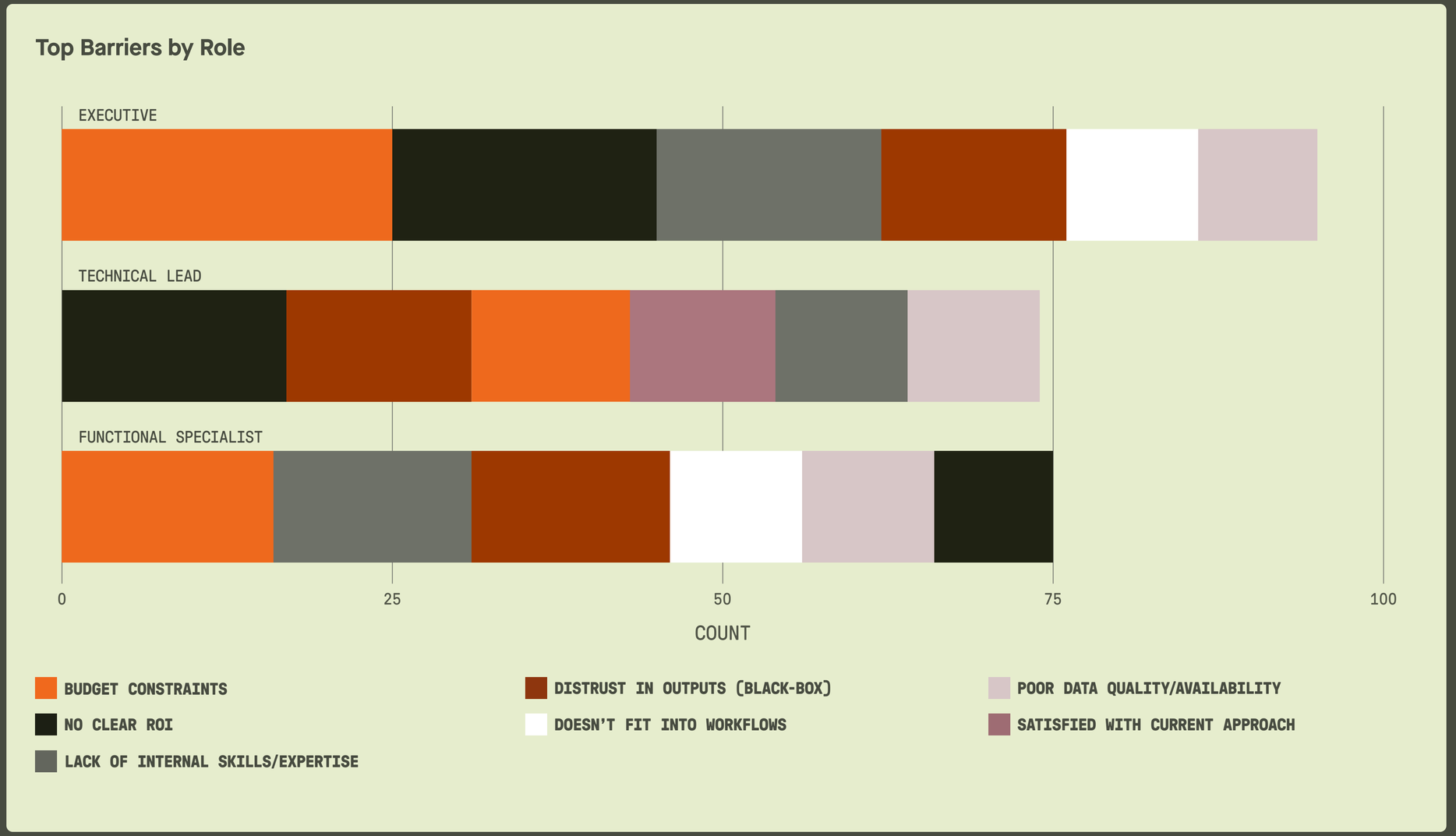
Exposure vs. Everyday Use:
Adoption

COMMON OBSTACLES

BARRIERS & RISKS

AT A GLANCE

Executives, technical leads, and functional specialists point to a common set of top barriers when considering AI/ML tools in exploration. Budget pressure is the most consistently cited concern, and many respondents also question the value these tools can deliver and the dependability of their outputs. Although the ordering shifts somewhat by role, the broader pattern indicates that financial considerations and confidence in model behaviour stand out as the primary obstacles to adoption regardless of where respondents sit within the exploration workflow.



COMMON OBSTACLES

BARRIERS & RISKS

ANALYSIS

The three role groups select a nearly identical mix of top barriers, which shows that hesitation toward AI/ML arises from shared pressures rather than isolated role-specific concerns.

Within this pattern, the way each group weighs these issues reveals subtle differences in how they approach decision-making. Executives and functional specialists both place budget pressure at the top of their selections. For executives, this likely reflects the responsibility they hold for allocating resources across programs and the need to justify any new investment within broader organizational planning. For functional specialists, the prominence of cost suggests that spending constraints remain highly visible in daily work and can influence whether new tools are viewed as practical to adopt.

Technical leads produce a slightly different ordering. They place ROI first, which indicates that they look for clear evidence that AI/ML can outperform or materially enhance existing workflows. Budget remains near the top for this group, but the emphasis on return may reflect a mindset shaped by technical accountability, where defensible exploration outcomes depend on clarity about both financial value and a tool's contribution to interpretive decisions.

Across all three roles, distrust in AI/ML outputs appears strongly. This alignment suggests that concerns about model transparency and consistency remain a major obstacle long before teams reach questions of implementation. Skills and data quality also surface for every group, signaling that uncertainty about internal readiness also plays a role in slowing adoption.

A notable distinction is that technical leads are the only group that indicates satisfaction with current approaches into their top barriers. This hints at confidence in established geological workflows and suggests that any new tool must demonstrate clear and consistent improvements before it shifts ingrained practice. Executives and functional specialists do not register this sentiment at the same level, which reinforces the idea that technical leads carry a unique responsibility for ensuring the integrity of interpretive methods.

Despite these nuances, the overarching picture is one of convergence. Financial pressure and questions about the reliability of AI/ML outputs shape the decisions of all three groups, and capability concerns remain present throughout. The small differences among them reflect their vantage points within the exploration workflow, but the broader pattern indicates that value clarity and confidence in model behaviour continue to set the pace for AI/ML adoption across roles.

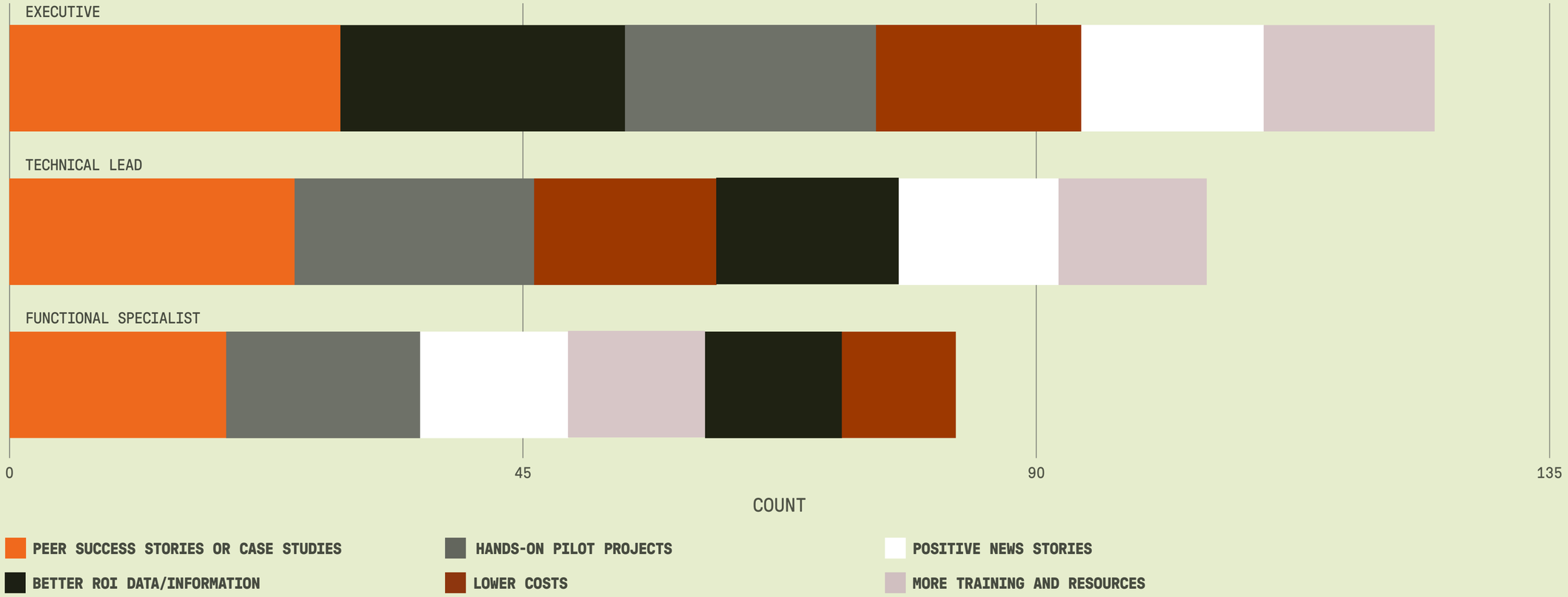
VALIDATION REQUIRED

SKEPTICISM

AT A GLANCE

The responses suggest an industry that remains in the validation phase when it comes to AI/ML adoption, where confidence hinges less on theoretical performance and more on demonstrated results. Broader adoption will likely advance as the gap between promise and proof closes.

What Drives Skepticism Away by Role



VALIDATION REQUIRED

SKEPTICISM

ANALYSIS

Executives, technical leads, and functional specialists, representing over 90% of respondents, select an identical set of top factors that can shift organizational views on AI/ML adoption, and they all place the strongest emphasis on real-world evidence.

Executives rank clearer ROI information as the second most important consideration, indicating that perceptions shift when evidence of effective use is accompanied by a well-defined understanding of expected return. Pilot work carries significant influence as well, although it sits lower in their ordering, suggesting that hands-on exposure matters but is typically considered after the financial case has been outlined.

For technical leads, the importance of applied exposure becomes more pronounced. Pilot work sits just behind peer success, showing that direct interaction with AI/ML forms a central part of how this group evaluates new tools. After these two influences, cost appears ahead of ROI in their ranking, which points to a practical focus on understanding the immediate implications of adopting new methods.

Functional specialists show a similar emphasis on pilot opportunities, yet their ranking diverges in ways that reflect their proximity to daily analytical tasks. Positive news stories and training appear earlier in their ordering than they do for the other groups, suggesting that visible industry momentum and opportunities to build capability play a more prominent role in how they judge the relevance of AI/ML to their work.

Across these three roles, the overall pattern shows that perceptions shift most when AI/ML can be evaluated through credible examples, combined with a clearer understanding of both the practical and financial implications.

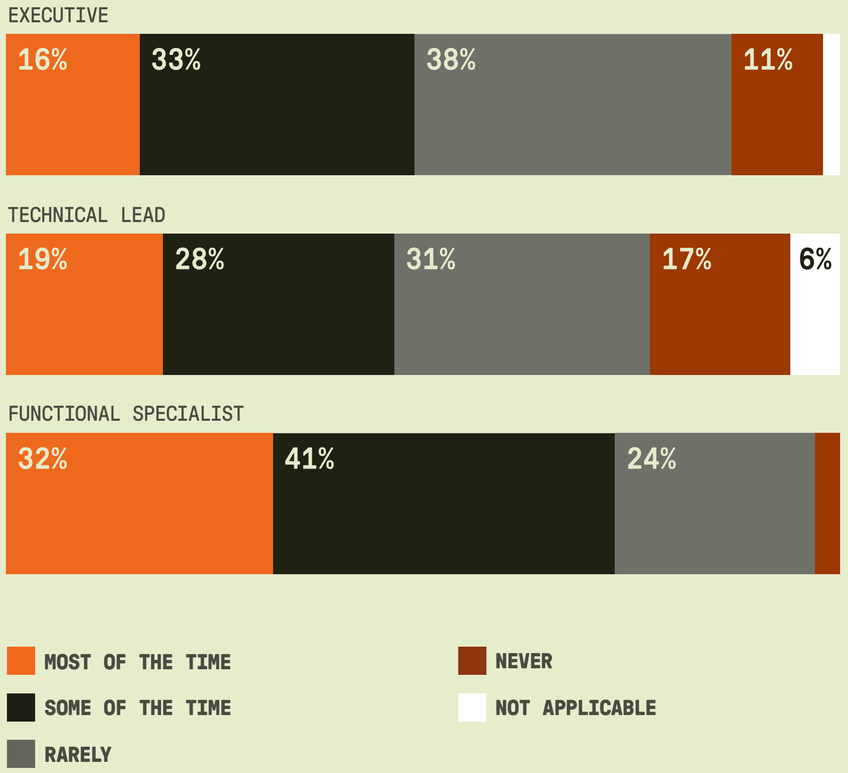
EXPOSURE VS. EVERYDAY USE

ADOPTION

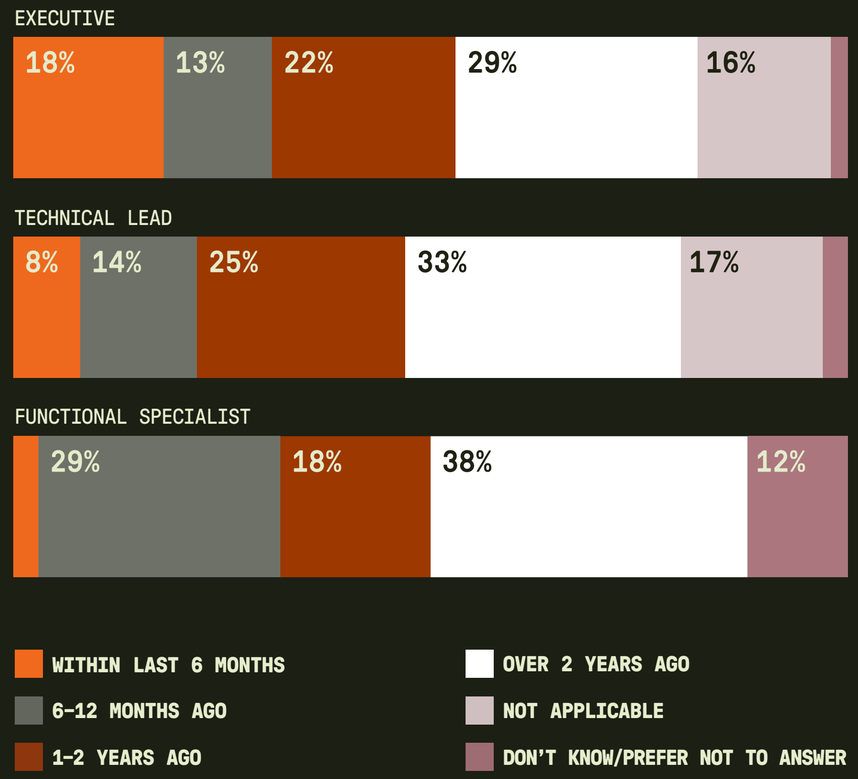
AT A GLANCE

The overall trend suggests that while awareness of AI/ML is relatively established across roles, sustained and frequent use remains concentrated among those responsible for the operational and analytical tasks where these tools are most readily applied. Frequency and timing of AI/ML use vary across the exploration workflow, but executives and technical leads tend to resemble each other more closely than they do functional specialists. In both groups, respondents are almost evenly divided between regular users (those who use the tools at least occasionally) and infrequent users (those who rarely or never use them), even though many first adopted these tools more than two years ago. In contrast, earlier exposure and more recent uptake, though present across all roles, align more closely with current practice among functional specialists, with a clear majority reporting regular use.

AI/ML Use Frequency by Role



AI/ML Adoption Timeline by Role



EXPOSURE VS. EVERYDAY USE

ADOPTION

ANALYSIS

Examining both frequency and timing shows that exposure to AI/ML has reached executives, technical leads, and functional specialists alike, but the depth of day-to-day use differs.

Executives and technical leads follow similar trajectories: Many indicate that they began using AI/ML over a year ago, yet their current engagement remains split between those who use these tools at least “Some of the time” and those who “Rarely” or “Never” rely on them. This suggests that early exposure at organizational and technical leadership levels does not necessarily result in routine application. In these roles, AI/ML often appears to be drawn on selectively, which may be shaped by the episodic nature of strategic decisions or the specific analytical questions that call for additional support.

Functional specialists show a different relationship between when adoption began and how often AI/ML is used today. Their responses span both earlier and more recent adoption, yet they are far more likely to use AI/ML on a consistent basis. Notably, none indicate that AI/ML is irrelevant to their work, even if some are uncertain about the exact point at which they began using it. This pattern may point to responsibilities where AI/ML aligns more readily with recurring analytical tasks, allowing initial exposure, whether early or recent, to develop into sustained practice.

Together, these results show that similar adoption timelines can lead to different levels of integration. While familiarity with AI/ML is widespread across executives, technical leads, and functional specialists, regular use appears to be concentrated in positions where the tools contribute directly to ongoing analytical work rather than to intermittent decision-making.

03 THE INFLUENCE OF ORGANIZATIONAL CULTURE

HOW INNOVATION THRIVES OR BREAKS DOWN WITHIN TEAMS

SECTION

A

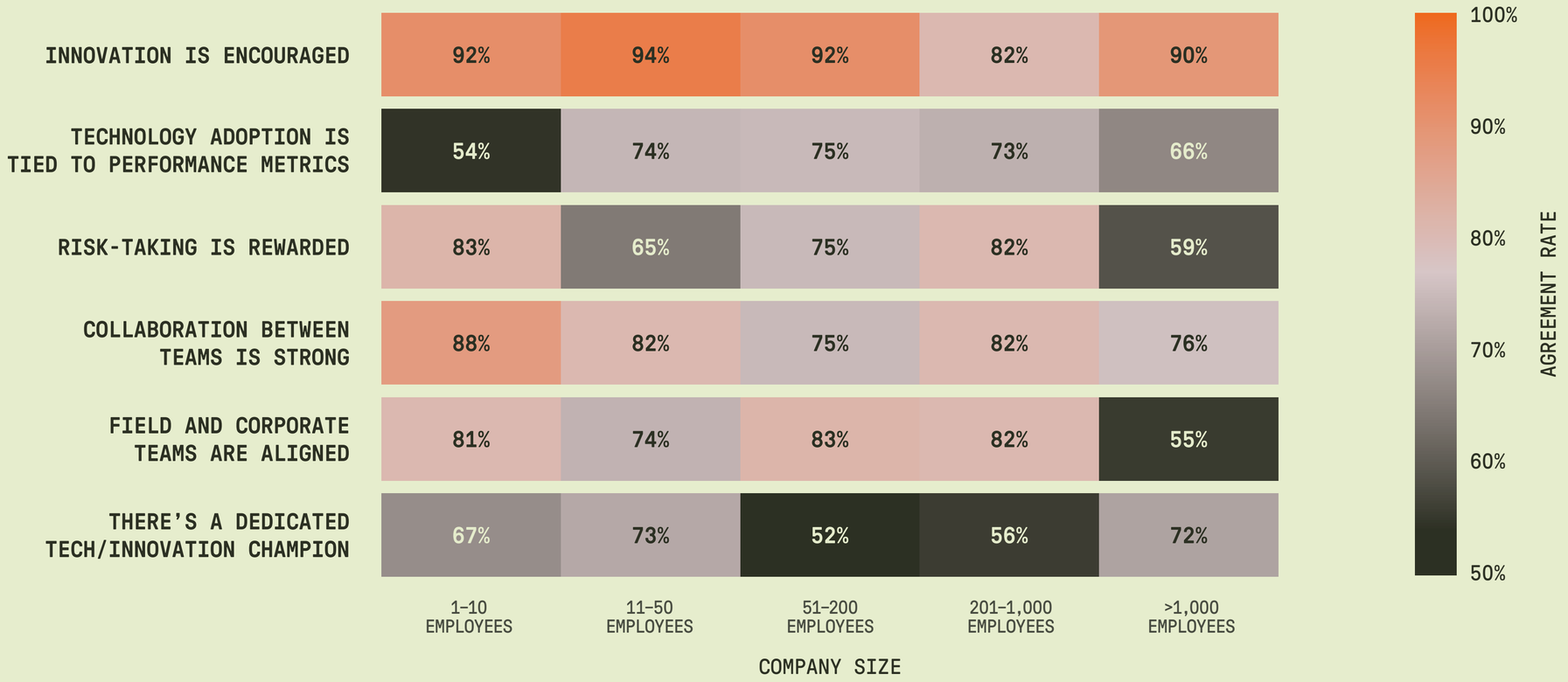
Intent Is Not Enough

INTENT IS NOT ENOUGH

AT A GLANCE

Regardless of company size, teams express a strong belief in the importance of innovation, yet actual adoption of AI/ML tools lags considerably, revealing a gap between belief and behaviour. Larger organizations (1,000+ employees), despite projecting a pro-innovation stance, show internal contradictions with risk-taking not often rewarded and technology adoption not consistently tied to performance. Smaller teams (1–10 employees) are also eager to innovate but may lack the processes required for sustained adoption. Internal collaboration appears relatively strong across all size groups, suggesting that once adoption becomes more embedded, organizations are well-positioned to share learnings and best practices. However, alignment between field and corporate teams declines with larger companies, potentially highlighting an additional barrier to effective innovation at scale.

Organizational Mindset by Company Size



AGREEMENT RATE IS DERIVED BY DIVIDING THE COMBINED COUNT OF "STRONGLY AGREE" AND "AGREE" RESPONSES BY THE TOTAL RESPONSE COUNT FOR EACH GROUP.

INTENT IS NOT ENOUGH

ANALYSIS

Across all company sizes, there is a strong level of agreement around innovation.

This is promising for adoption of AI/ML tools, however as seen in the “Frequency of Use” section on Page 50 of this report, only 56% of respondents use this type of technology occasionally or more often. This indicates a sizable delta between perception and reality, while also showing there is optimism to bridge the gap.

With larger companies (1,000+ employees), discrepancies are more apparent across these areas of agreement. These organizations project a pro-innovation stance, with 90% claiming that innovation is encouraged. Yet the internal reality reported by respondents contradicts this. Just under 60% of these same respondents believe risk-taking is actually rewarded, and only 66% see technology adoption tied to performance metrics (the second lowest after those with 1–10 employees at 54%). This may indicate a culture of performance where experimentation is notionally applauded but operationally deprioritized. Though these companies likely possess the capital to innovate, there may be a lack of willingness to embrace change or psychological safety to sustain it.

Conversely, small companies (1–10 employees) report a high level of willingness to embrace innovation, but may not yet have the structure or rigor to engrain AI/ML tools into their processes and strategies. This group shows the lowest response rate of AI/ML usage being tied to performance outcomes (54%), indicating that formalized processes may be absent in measuring and operationalizing AI/ML impact or that performance metrics have not yet been established during this stage of operation.

Collaboration appears relatively strong across all company sizes, though there is a notable dip among the 51–200 employee group and the largest organizations (1,000+ employees). This may stem from mid-sized teams experiencing more rapid growth which can create silos, similarly to larger teams where compartmentalized structures are often reported. In contrast, the smallest companies (1–10 employees) report the highest levels of collaboration — unsurprising given that members of small teams often span multiple responsibilities and rely on close coordination to move projects forward. This dynamic becomes even more interesting when compared with perceptions of alignment between corporate and field teams. Among small companies (1–10 employees), 81% of respondents report strong alignment, whereas only 55% of respondents from large companies (1,000+ employees) say the same — the lowest across all groups and almost 19 percentage points below the second lowest.

Another outlier to highlight is the extent to which risk-taking is rewarded, with large organizations (1,000+ employees) reporting the lowest agreement. This could be due to more rigid structures within larger organizations, less autonomy for individuals with respect to taking on risk, and generally more structure in day-to-day work. On the other hand, it is unsurprising that the smallest companies (1–10 employees) should see the highest level of risk-taking being rewarded, which is in line with the start-up ethos present in many of these companies. Closely behind this group are companies with 201–1,000 employees, who report an 82% agreement rate when it comes to supporting risk-taking, which might indicate a sweet spot of balancing agility and resourcefulness with bureaucracy and process.

04 THE REALITY OF PERCEPTION

HOW THE COMPANIES VIEW THEMSELVES (AND OTHERS) WHEN IT COMES TO INNOVATION

SECTION

A

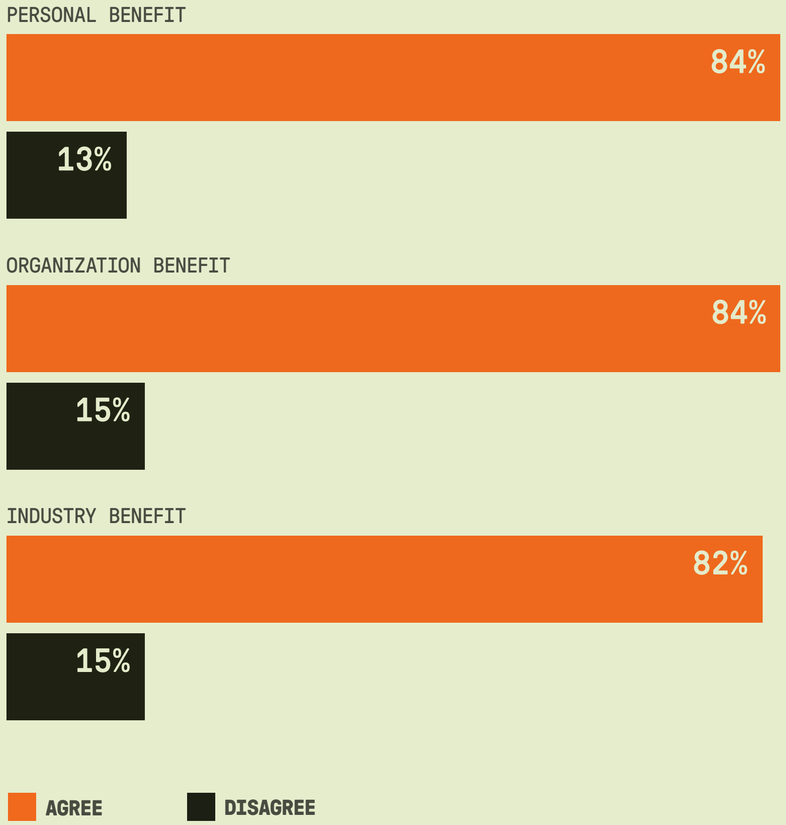
Optimistic but Isolated

OPTIMISTIC BUT ISOLATED

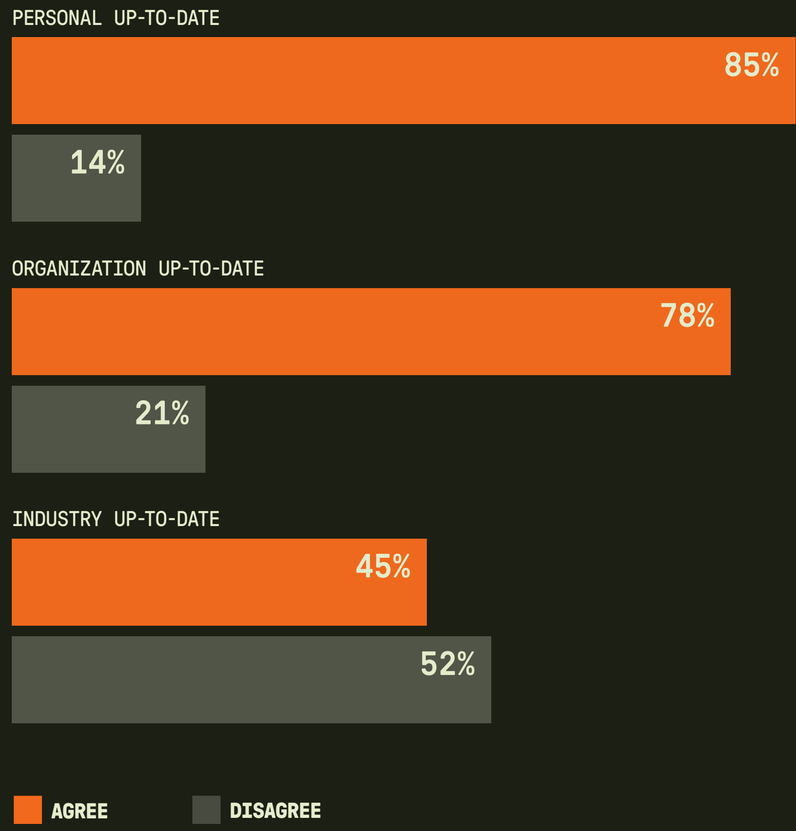
AT A GLANCE

The industry is broadly optimistic about AI/ML, yet this optimism is contrasted by how companies perceive others' ability to embrace innovation. Individuals and organizations feel confident in their own adaptability, but that confidence drops when looking to the industry at large, suggesting progress is happening but not being shared. The near-even split on trust, competitiveness, and the table-stakes nature of new technology reinforces this observed lack of shared understanding. The opportunity now is to increase visibility and cross-organizational knowledge sharing to accelerate collective progress.

I am optimistic that these tools and technology are going to benefit my role, my organization, and the industry as a whole in the next few years.



I am personally, my organization is, and the industry as a whole is keeping up to date with these tools and technology.



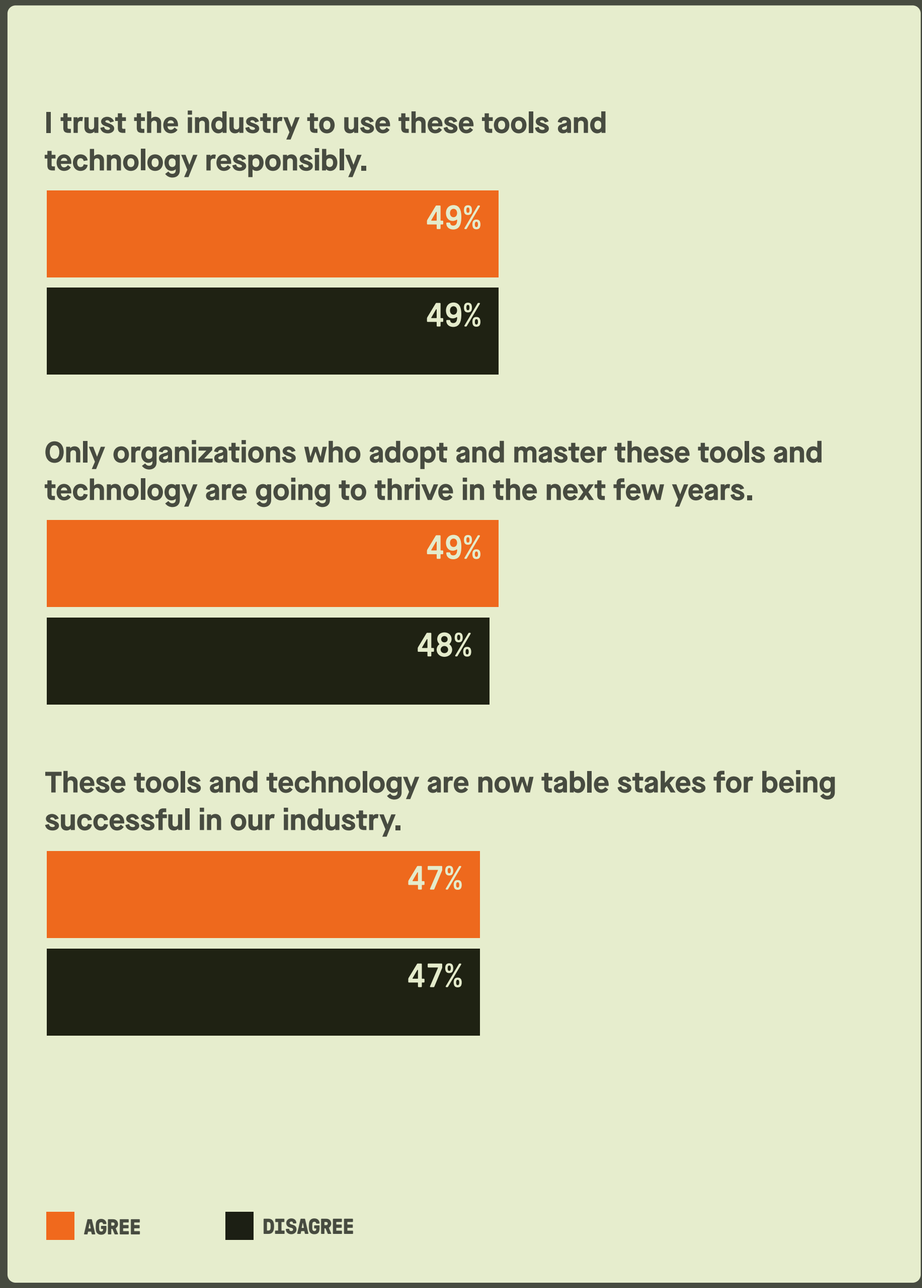
OPTIMISTIC BUT ISOLATED

ANALYSIS

Overall, it is clear that the industry is optimistic about the benefits of AI/ML, with more than eight in ten respondents agreeing with statements about personal, organizational, and industry-wide optimism.

Despite this shared sentiment, there is a disconnect when it comes to perception of how different groups are keeping up to date with AI/ML tools. The vast majority of respondents express high confidence in their own adaptability, with 85% stating they are personally staying current. This confidence extends to their immediate surroundings, where nearly 80% believe their specific organization is maintaining pace with technological advancements. Yet the optimism collapses when they look outward to the industry at large: Less than half of these same respondents believe the industry as a whole is keeping up with innovation.

This discrepancy may suggest that innovation in exploration is not fully understood, where one company's perceived innovation is not interpreted as such by another. Given the acceleration of AI/ML innovation, it comes as no surprise that there would be a disparity in perception. Through these responses, companies seem to perceive themselves as the exceptional fast movers in a slow market, which may create a false sense of competitive isolation. This sense of overconfidence can limit an organization's awareness of the real progress being made by competitors, leaving them less ready for the disruption they assume is not happening. It may also prevent a true community of practice from forming, potentially reducing opportunities for shared learning and ultimately lowering the likelihood for innovation and proven tools to take hold across the industry.



OPTIMISTIC BUT ISOLATED

ANALYSIS

Further, this indicates that the industry may be suffering from a visibility-and-sharing crisis rather than a capability one. The industry may not necessarily be failing to innovate, but it is likely not succeeding in communicating those innovations effectively or sharing wins externally. Though sharing could be seen as equipping competitors with advantageous information, the reality is that each company is working on distinct projects so there are elements of sharing that are less risky. This can be viewed as an opportunity to break down the silos of innovation between organizations. For the industry to mature, there is a need to bridge the gap between individual excellence and collective progress, recognizing that shared knowledge ultimately benefits everyone.

Interestingly, responses are nearly perfectly split around the following statements:

- “I trust the industry to use these tools and technology responsibly” (49% agree vs. 49% disagree)
- “Only organizations who adopt and master these tools and technology are going to thrive in the next few years” (49% agree vs. 48% disagree)
- “These tools and technology are now table stakes for being successful in our industry” (47% agree vs. 47% disagree)

This could indicate that the industry lacks a shared understanding of where it collectively stands in relation to trust, competitiveness, and the table-stakes nature of new technology across, despite high overall optimism about AI/ML. The opportunity may lie in creating platforms and practices that make innovation more transparent and shared, helping the industry move forward together rather than having each company advance in isolation.

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IN-DEPTH ANALYSIS

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01 WHERE WE ARE TODAY

TECHNOLOGY USE AND THE ADOPTION OF AI/ML TOOLS

SECTION

A

Digital Technology Use in Exploration

SECTION

B

Adoption and Integration of AI/ML in Exploration Workflows

CURRENT TECHNOLOGY USAGE

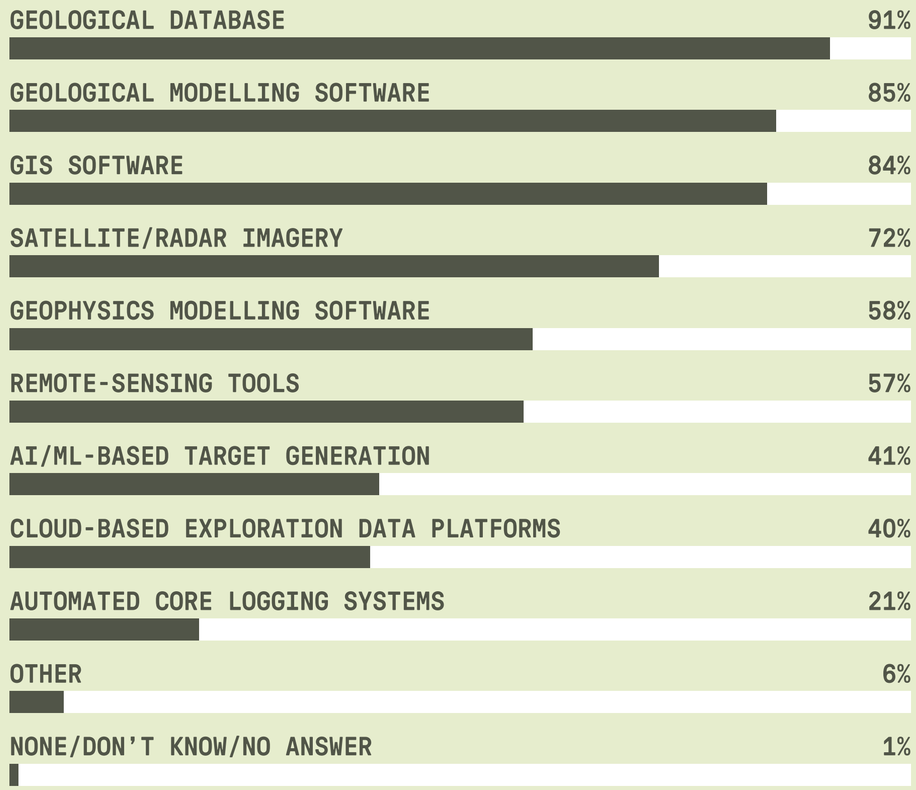
Participants report using a wide range of exploration technologies, reflecting both long-established digital tools and newer approaches beginning to gain traction. Regular use of geological databases is noted by the vast majority of respondents (91%), followed by geological modelling software (85%) and geographic information system (GIS) software (84%). Satellite or radar imagery is used by 72% of respondents, while geophysics modelling software and remote-sensing tools are each cited by just under 60% (58% and 57%, respectively). Approximately four in ten indicate regular use of AI/ML-based target generation (41%) or cloud-based exploration data platforms (40%). Automated core logging systems are far less common at 21%, and only a small minority report using other technologies (6%) or none at all (1%).

Digital tools supporting the organization and analysis of geological data are well-established across the industry.

ANALYSIS

The findings suggest that digital tools supporting the organization and analysis of geological data are now well-established across the mineral exploration industry, spanning companies of varying sizes. Adoption declines for technologies that demand more advanced data integration or higher investment, such as AI-driven targeting and cloud-based data platforms, indicating that many organizations are still in the early stages of testing or partial implementation. Automated core logging systems remain a niche capability, likely limited by both cost and the operational adjustments they entail. Overall, the pattern depicts an industry where foundational software has become standard practice, while AI/ML and automation are emerging, but not yet widely embedded in routine workflows.

EXPLORATION TECHNOLOGIES USED



BASE: ALL RESPONDENTS (N = 135)

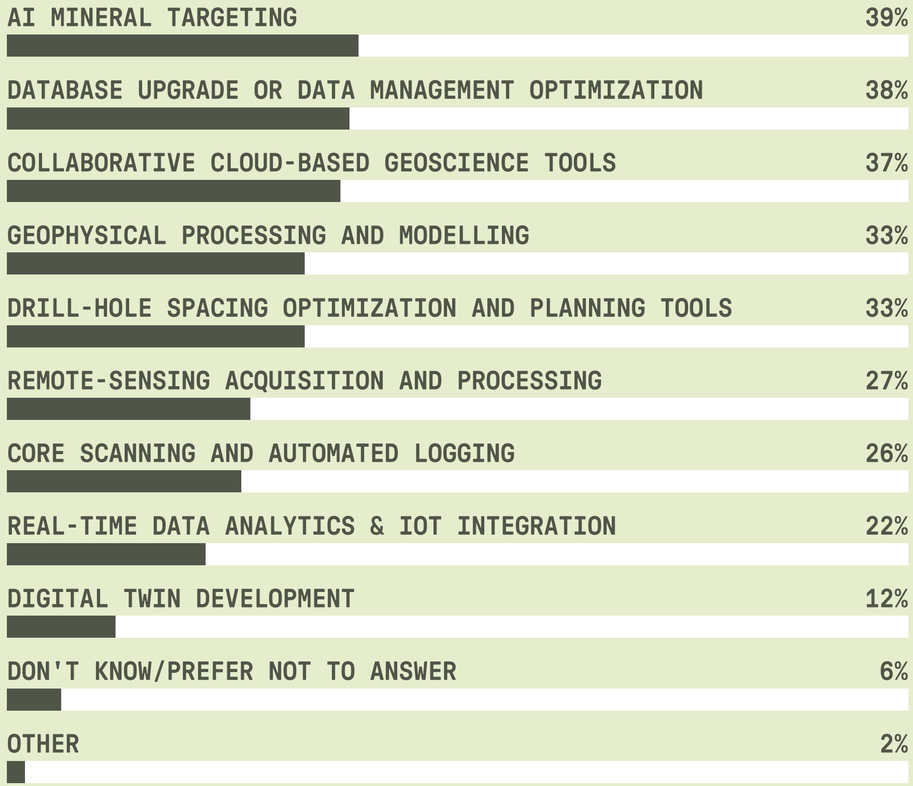
SURVEY QUESTION: WHICH OF THE FOLLOWING EXPLORATION TECHNOLOGIES ARE USED REGULARLY IN YOUR ORGANIZATION? SELECT ALL THAT APPLY.

EMERGING PRIORITIES FOR TECHNOLOGY DEVELOPMENT

Looking ahead, many respondents express a clear focus on technologies that enhance targeting and strengthen data organization and collaboration. About four in ten identify AI mineral targeting as a key priority (39%), with similar shares emphasizing database upgrades or data management optimization (38%) and collaborative cloud-based geoscience platforms (37%). About one-third highlight geophysical processing and modelling (33%) or drill-hole spacing optimization and planning tools (33%). Interest then tapers toward remote sensing (27%), core scanning and automated logging (26%), and real-time data analytics incorporating Internet of Things (IoT) systems (22%). Only a small minority mention digital twin development (12%) and other initiatives (2%) or are unsure (6%).

Four in ten respondents identify AI mineral targeting as a key priority, with a similar share emphasizing database upgrades or data management optimization.

TECHNOLOGY PRIORITIES FOR NEXT 12 MONTHS



BASE: ALL RESPONDENTS (N = 135)

SURVEY QUESTION: WHICH OF THE FOLLOWING ARE TECHNOLOGY PRIORITIES FOR YOUR ORGANIZATION IN THE NEXT 12 MONTHS? SELECT ALL THAT APPLY.

ANALYSIS

The results reveal a technology agenda that balances innovation with consolidation. Exploration teams are investing in AI/ML to sharpen targeting, but are equally focused on improving the data foundations and collaborative systems that make these tools effective. The alignment among the leading priorities suggests a shared understanding that advanced analytics depends on reliable data and coordinated workflows. Beneath these top choices, continued work on geophysical processing, planning tools, and emerging sensing technologies shows that organizations are refining both interpretation and field execution. Real-time integration and digital twins are still in the exploratory phase, yet they signal growing interest in connecting analysis more directly to operations.

TIMELINE OF ADOPTION

Approximately one-third of respondents (33%) report that their organizations began using or testing advanced or emerging AI/ML tools for mineral exploration more than two years ago. Just over one-quarter (26%) adopt these technologies within the past year, while 23% indicate adoption occurred between one and two years ago. The remaining 18% either do not know when their organization began using these tools or consider the question not applicable.

ANALYSIS

The adoption of AI/ML in mineral exploration appears to have progressed steadily rather than through a single wave of uptake. A core group of organizations have been working with these technologies for more than two years, while another segment has only recently begun adopting them, suggesting that interest is now extending beyond early adopters. Those initiating use one to two years ago form a middle cohort, reinforcing a picture of consistent, incremental growth across the sector. The proportion of respondents who are uncertain or not involved indicates that familiarity with AI/ML remains uneven, and integration is still evolving. These findings hint at a period in which greater accessibility of software and data has encouraged experimentation and gradual adoption. The share of recent adopters, however, illustrates growing momentum that may potentially signal a broader phase of implementation ahead.

WHEN AI/ML TOOL USE TO SUPPORT MINERAL EXPLORATION STARTED

BASE: ALL RESPONDENTS (N = 135)

SURVEY QUESTION: WHEN DID YOUR ORGANIZATION FIRST START USING OR TESTING ADVANCED OR EMERGING AI OR ML TOOLS TO SUPPORT MINERAL EXPLORATION?
SELECT ONE RESPONSE.

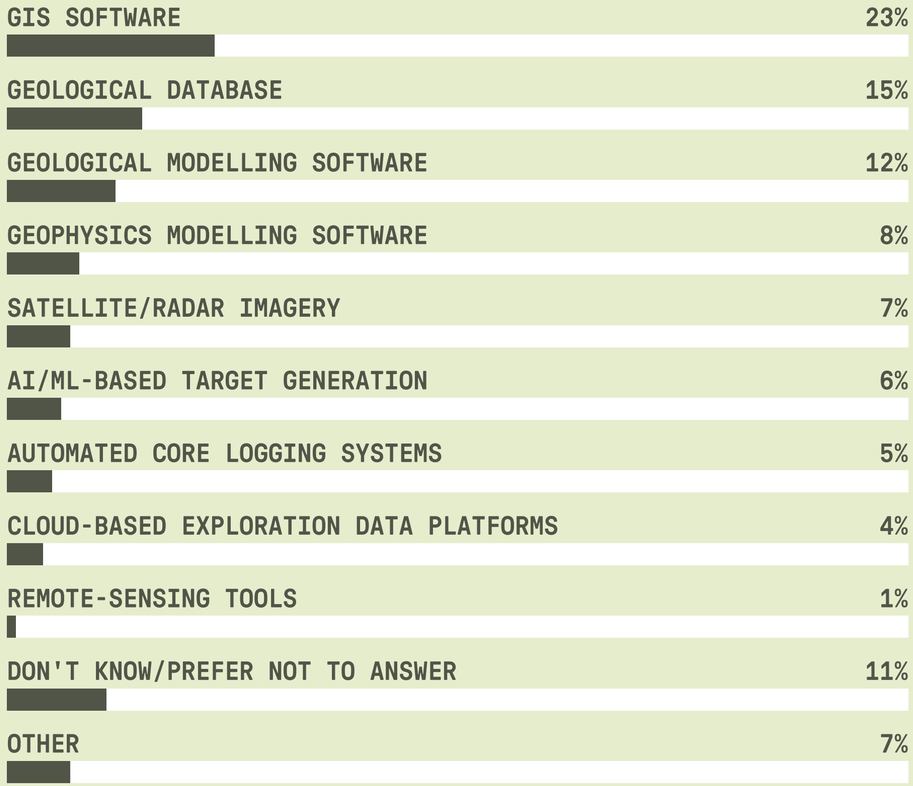
I AM STARTING TO USE AI A LOT MORE BUT AM SKEPTICAL ABOUT ITS METHODS OF TARGETTING... IT IS ONLY AS GOOD AS THE INFORMATION FED TO IT.”

– SURVEY RESPONDENT

FIRST TECHNOLOGY INITIATIVES

When asked which exploration technology their organization first implemented, respondents most frequently identify GIS software (23%). Geological databases are the next most common (15%), followed by geological modelling software (12%). Geophysics modelling tools account for 8%, and satellite or radar imagery for 7%. AI/ML-based target generation is mentioned by 6%, while automated core logging systems (5%), cloud-based exploration data platforms (4%), and remote-sensing tools (1%) are less commonly cited. Seven percent note other types of technology, and 11% either do not know or give no answer.

FIRST EXPLORATION TECHNOLOGY INITIATIVE LAUNCHED



BASE: ALL RESPONDENTS (N = 135)

SURVEY QUESTION: WHAT WAS THE FIRST EXPLORATION TECHNOLOGY INITIATIVE LAUNCHED AT YOUR CURRENT COMPANY? SELECT ONE RESPONSE.

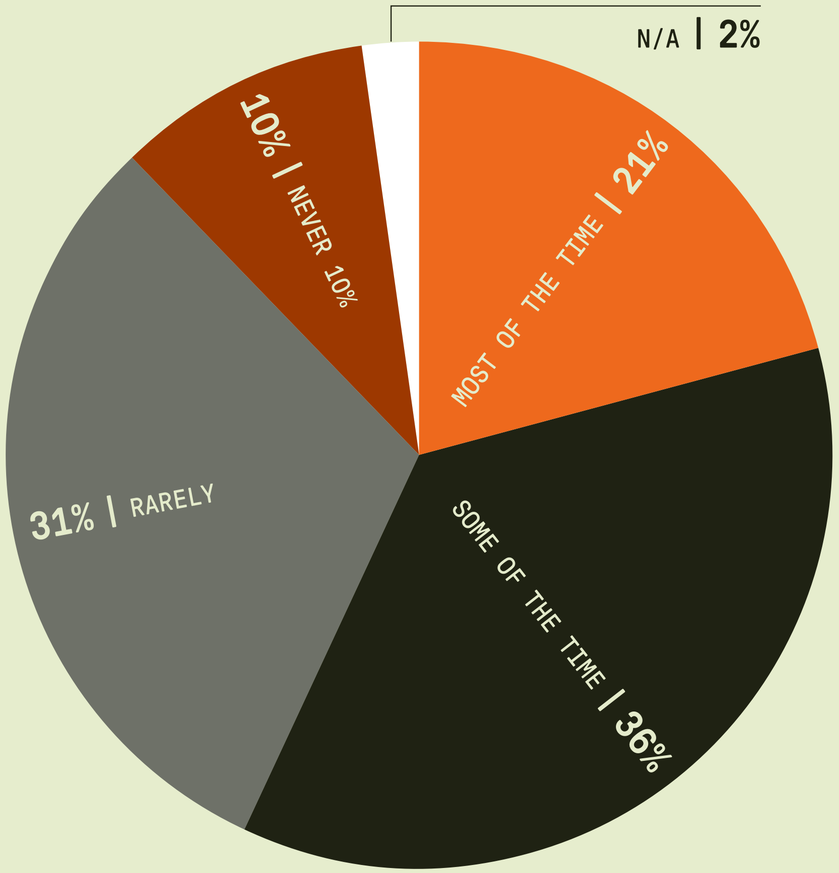
ANALYSIS

The responses suggest that many organizations begin their technology adoption journey with tools designed to manage and visualize spatial and geological data. GIS, databases, and modelling software dominate as early initiatives, underscoring their foundational role in data organization and interpretation. By contrast, more advanced or data-intensive technologies, such as AI/ML-based targeting and cloud-based platforms, are rarely a first step. This pattern suggests that organizations typically establish core digital capabilities before expanding into emerging or automated systems. The proportion mentioning other types of technology or expressing uncertainty further implies that early adoption pathways can vary across companies and are not always formally documented.

FREQUENCY OF USE

More than half of participants report incorporating advanced or emerging AI/ML tools into their exploration projects at least some of the time. Just over one in five (21%) say they rely on them most of the time, while more than a third (36%) use them only occasionally. About one-third (31%) describe their use as rare, and one in ten (10%) report never applying such tools. Only a small proportion (2%) consider the question not applicable to their work.

INVOLVING AI/ML TOOLS IN EXPLORATION PROJECTS



BASE: ALL RESPONDENTS (N = 135)

SURVEY QUESTION: HOW OFTEN ARE YOU CURRENTLY INVOLVING ADVANCED OR EMERGING AI OR ML TOOLS IN YOUR EXPLORATION PROJECTS? SELECT ONE RESPONSE.

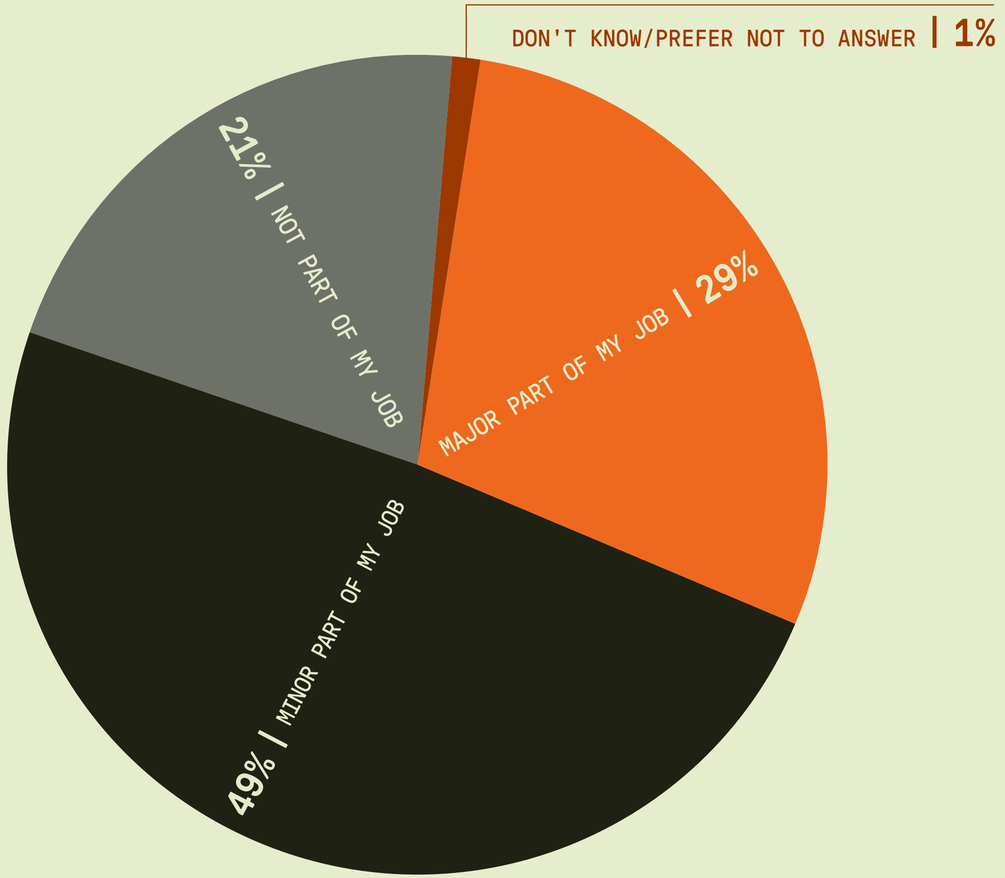
ANALYSIS

The results indicate that AI/ML tools are increasingly present in mineral exploration, but consistent use remains limited. Most organizations appear to be in an experimental or selective adoption phase, likely deploying these tools where they add clear value rather than as a standard component of every project. The substantial group reporting rare use suggests that, while awareness of these technologies is widespread, broader integration may still depend on demonstrating their reliability and commercial benefits. The small minority with no involvement at all reinforces that familiarity with AI/ML is now common across the sector, even if full operational integration is still emerging.

INTEGRATION INTO ROLES

Nearly eight in ten (78%) respondents report that evaluating, selecting, or integrating AI/ML tools form at least some part of their role. Twenty-nine percent say it is a major focus, while 49% describe it as a minor element of their job. About one in five (21%) indicate that these technologies are not part of their responsibilities, and 1% provide no answer.

PORTION OF JOB INVOLVING ADVANCED/EMERGING AI/ML TOOLS



BASE: ALL RESPONDENTS (N = 135)

SURVEY QUESTION: HOW MUCH OF YOUR JOB INVOLVES EVALUATING, SELECTING, OR INTEGRATING ADVANCED OR EMERGING AI OR ML TOOLS? SELECT ONE RESPONSE.

ANALYSIS

These results suggest that involvement with AI/ML has become a common feature of exploration roles, though often at a modest scale. A smaller cohort carries significant responsibility for these technologies, but a larger share is involved only intermittently, showing that AI/ML tools often complement rather than define most professionals' day-to-day work. The proportion with no involvement highlights that adoption remains uneven across functions. Though no indication of age was gathered during the survey process, it could be interesting to trend this data over time to see if AI adoption increases as the next generation of geologists move from academia into the field.

WE NEED PROFESSIONALS WITH KNOWLEDGE IN THEIR FIELDS — ESPECIALLY YOUNG ONES — THAT CAN UNDERSTAND WHAT AI IS DOING WITH DATA.”

– SURVEY RESPONDENT

02 WHAT DRIVES ADOPTION AND WHY

INVESTMENT, DECISION-MAKING, AND ORGANIZATIONAL MOTIVATION

SECTION

A

Funding Allocation for AI/ML Tools

SECTION

B

Decision Authority and Governance

SECTION

C

Motivations for Adopting AI/ML Technologies

SECTION

D

Factors Influencing Perception and Acceptance

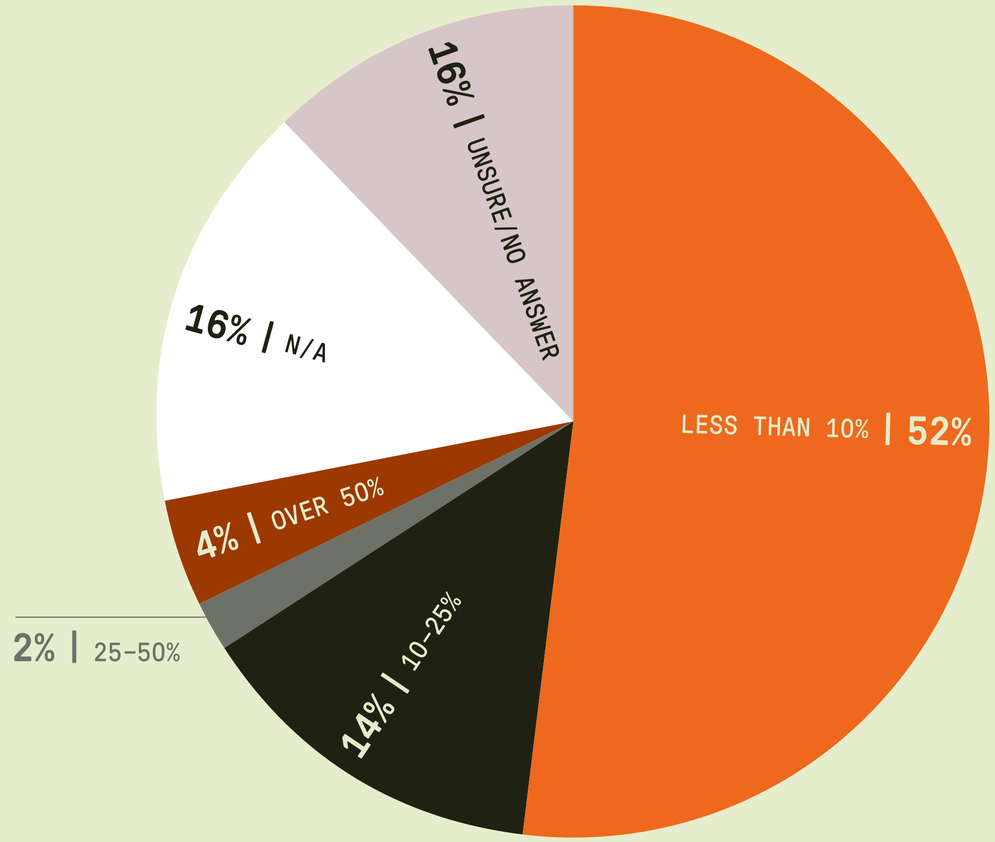
FUNDING ALLOCATION FOR AI/ML TOOLS

Spending on AI/ML remains modest across most exploration budgets. Just over half of respondents (52%) report allocating less than 10% of their exploration budget to these tools. Fourteen percent indicate spending between 10% and 25%, while only small proportions report allocating 25–50% (2%) or more than half of their exploration budget (4%). Another 16% say the question is not applicable, and the remaining 12% are unsure or provide no answer.

ANALYSIS

These results suggest that AI/ML continues to represent a relatively small share of exploration spending. Most organizations appear to be investing cautiously, keeping allocations low as they likely continue evaluating performance and potential use cases. A small number of higher spenders indicate that some projects are transitioning from experimentation to more integrated application, though such examples remain limited. The share of respondents who find the question inapplicable or cannot estimate their spending further highlights that structured budgeting for AI/ML is still developing, reflecting its position as an emerging, rather than established, component of exploration workflows.

PERCENTAGE OF EXPLORATION BUDGET ALLOCATED TO ADVANCED/EMERGING AI/ML TOOLS



BASE: ALL RESPONDENTS (N = 135)

SURVEY QUESTION: APPROXIMATELY WHAT PERCENTAGE OF YOUR EXPLORATION BUDGET GOES TO ADVANCED OR EMERGING AI OR ML TOOLS? SELECT ONE RESPONSE.

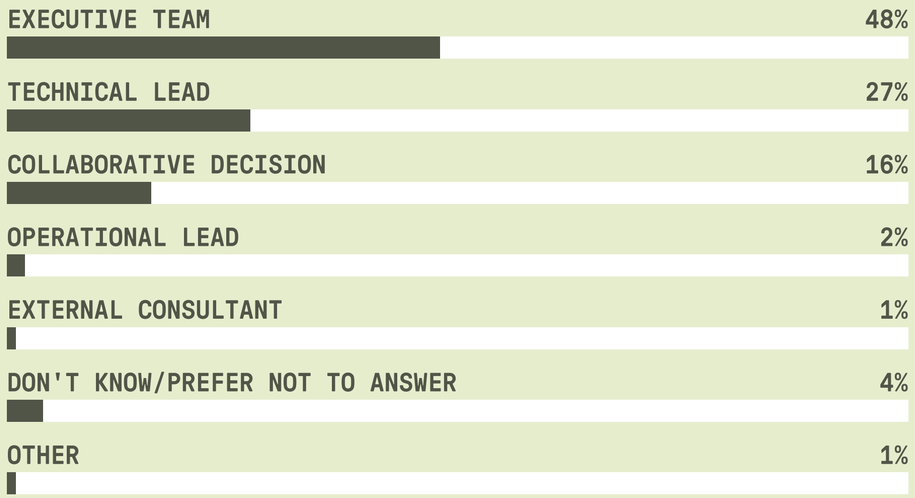
I THINK ONE OF THE BIGGEST HURDLES IS THE COST SO MANY COMPANIES ARE ASKING FOR THEIR PRODUCTS...[INSTEAD] BUILD IT IN INCREMENTS AND BE REALISTIC WITH WHAT IT WILL DELIVER.”

– SURVEY RESPONDENT

DECISION AUTHORITY AND GOVERNANCE

Almost half of respondents report that final decisions to adopt new exploration technologies, including AI/ML tools, rest with their executive team (48%). Another 27% say these choices typically fall to a technical lead, while 16% describe a collaborative process involving multiple roles. Only small numbers identify an operational lead (2%), an external consultant (1%), or other arrangements (1%), and 4% are unsure or provide no response.

FINAL DECISION-MAKER ON ADOPTING ADVANCED/EMERGING AI/ML TOOLS



BASE: ALL RESPONDENTS (N = 135)

SURVEY QUESTION: WHO TYPICALLY MAKES THE FINAL DECISION TO ADOPT NEW EXPLORATION TECHNOLOGIES, INCLUDING ADVANCED OR EMERGING AI OR ML TOOLS, IN YOUR ORGANIZATION? SELECT ONE RESPONSE.

ANALYSIS

Decision-making around AI/ML adoption remains concentrated at the top of most organizations. This indicates that technology selection is still treated as a strategic matter, closely tied to investment priorities and overall direction. Technical leads play a significant supporting role in evaluating and recommending tools, but shared or distributed decision models are relatively uncommon. The limited mention of operational staff or external advisors suggests that AI/ML adoption typically proceeds under the guidance of leadership and in-house expertise rather than through decentralized or outsourced channels.

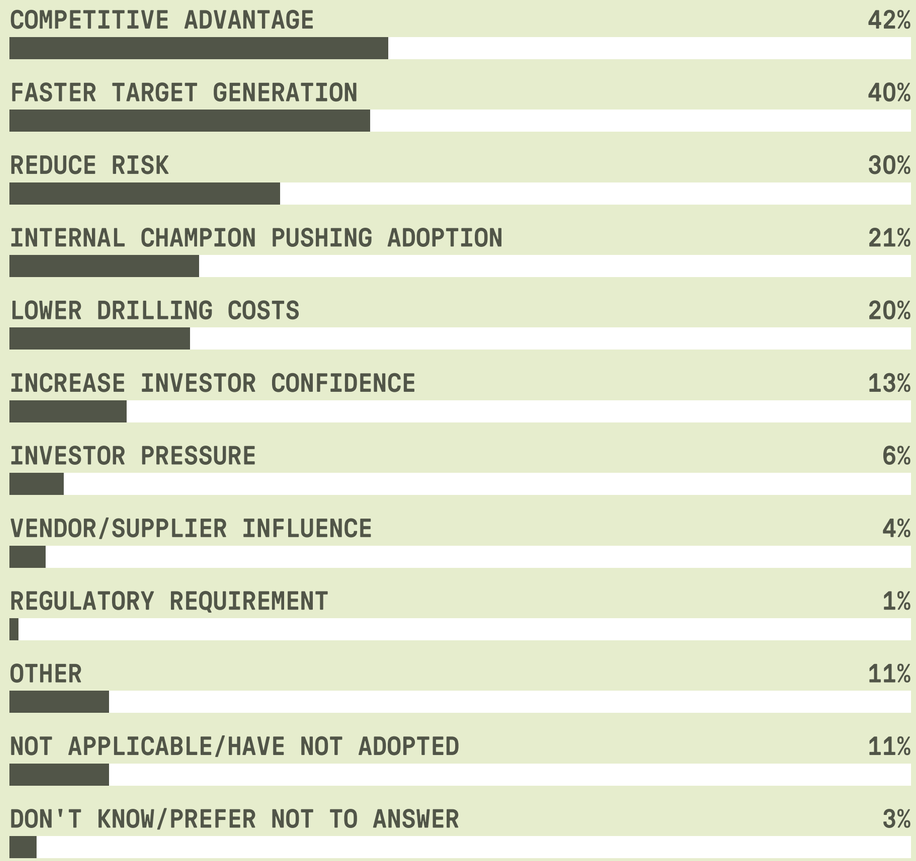
MOTIVATIONS FOR ADOPTING AI/ML TECHNOLOGIES

Responses indicate that the adoption of AI/ML tools in mineral exploration is driven primarily by business performance objectives. Competitive advantage is cited by 42% of respondents, and faster target generation by 40%. Reducing risk follows at 30%, while 21% point to the influence of an internal champion and 20% to lowering drilling costs. Smaller proportions connect adoption to external influences, such as investor confidence (13%), investor pressure (6%), input from vendors or suppliers (4%), and regulatory requirements (1%). Other reasons account for 11%, an equal share say adoption is not applicable, and 3% provide no answer.

ANALYSIS

These findings show that organizations view AI/ML as a means to enhance efficiency and competitiveness rather than to satisfy external demands. Competitive advantage and faster target generation emerge as the clearest motivators, signaling that adoption is closely tied to improving exploration outcomes and maintaining a strategic edge. Risk reduction adds a complementary rationale, reflecting efforts to make exploration decisions more data-driven and reliable. The prominence of internal champions highlights the importance of individual initiative in advancing new technologies, while the comparatively low influence of investors, suppliers, and regulators suggests that adoption remains internally led and strategically driven rather than externally imposed.

BIGGEST REASONS FOR ADOPTING ADVANCED/EMERGING AI/ML TOOLS



BASE: ALL RESPONDENTS (N = 135)

SURVEY QUESTION: WHICH OF THE FOLLOWING ARE THE BIGGEST REASONS YOUR ORGANIZATION HAS ADOPTED EXPLORATION TECHNOLOGY, SPECIFICALLY ADVANCED OR EMERGING AI OR ML TOOLS? SELECT UP TO THREE RESPONSES.

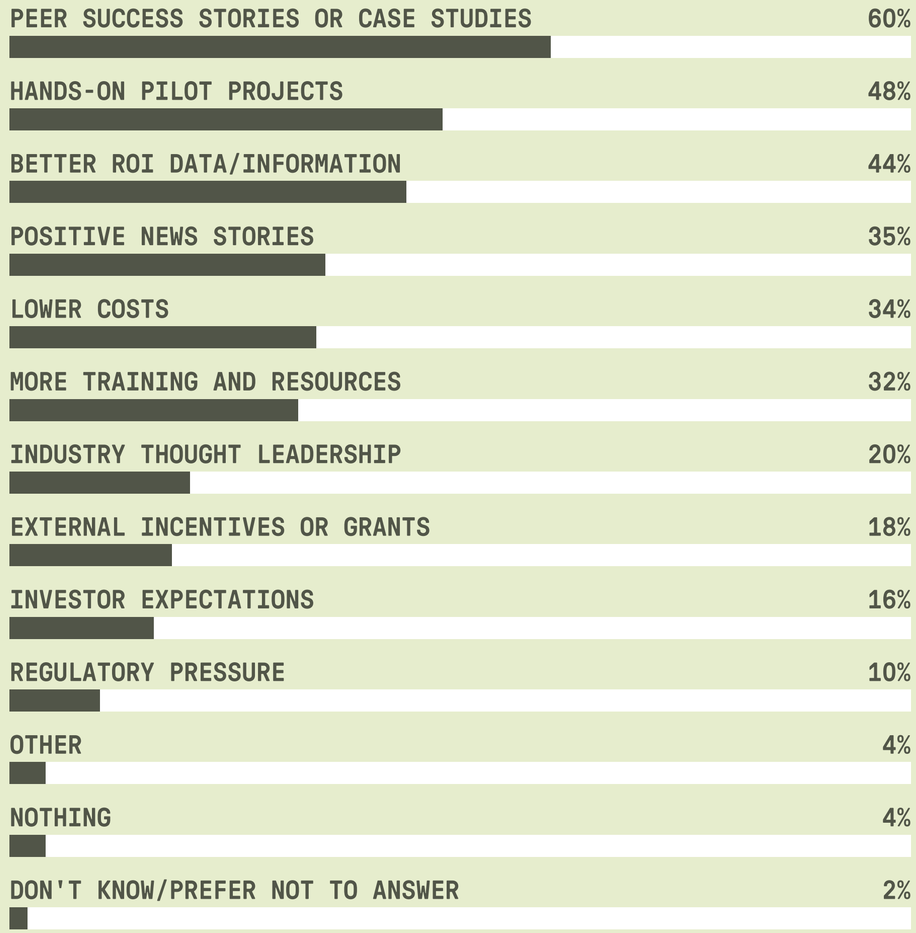
FACTORS INFLUENCING PERCEPTION AND ACCEPTANCE

Peer success stories or case studies are identified most often as effective in changing organizational perceptions of advanced or emerging AI/ML tools (60%). Nearly half of respondents indicate hands-on pilot projects (48%), and 44% emphasize better ROI data or information. Smaller but notable proportions cite positive news coverage (35%), lower costs (34%), and additional training and resources (32%). Fewer respondents mention industry thought leadership (20%), external incentives or grants (18%), or investor expectations (16%), while only 10% cite regulatory pressure. A small number select “Other” (4%), “Nothing” (4%), or “Don’t know/No answer” (2%).

ANALYSIS

The findings indicate that perceptions shift most effectively when organizations can observe credible success among peers and then validate these lessons through their own pilot work, reinforced by evidence that such approaches deliver measurable improvements. Training and cost reduction also contribute, likely by lowering perceived barriers to entry. External forces such as investor expectations or regulation appear to have limited influence, suggesting that the momentum to normalize AI/ML adoption is likely to come from within the exploration community itself, driven by practical results.

CHANGING PERCEPTIONS ABOUT USING ADVANCED/EMERGING AI/ML TOOLS



BASE: ALL RESPONDENTS (N = 135)

SURVEY QUESTION: WHICH OF THE FOLLOWING WOULD BE EFFECTIVE AT CHANGING YOUR ORGANIZATION’S PERCEPTIONS ABOUT USING NEW TECHNOLOGY, SPECIFICALLY ADVANCED OR EMERGING AI OR ML TOOLS? SELECT ALL THAT APPLY.

03 WHAT'S HOLDING US BACK

TRUST, SKEPTICISM, AND RISK IN IMPLEMENTING AI/ML

SECTION

A

Confidence in Responsible Use of AI/ML

SECTION

B

Most Skeptical Stakeholders

SECTION

C

Barriers to Adoption

SECTION

D

Perceived Risks and Concerns

SECTION

E

Risk Tolerance

CONFIDENCE IN RESPONSIBLE USE OF AI/ML

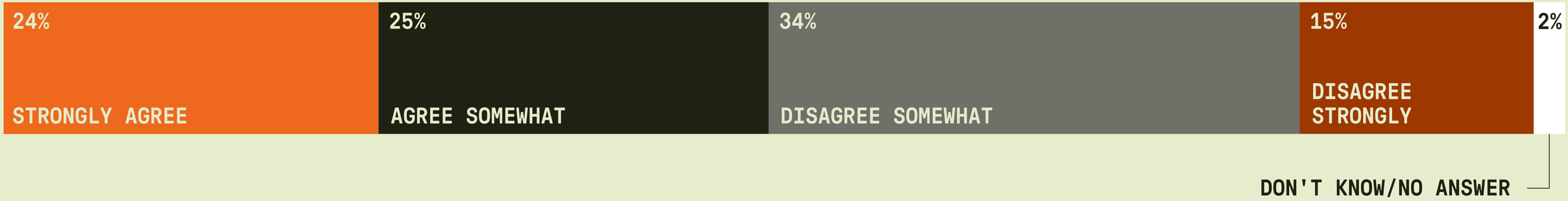
Roughly half of respondents say they trust the industry to use advanced or emerging AI/ML tools responsibly (49%), while an equal share (49%) disagree. Within that, 24% express strong agreement and 25% moderate agreement, compared with 34% who somewhat disagree and 15% who disagree strongly. A small proportion (2%) are uncertain or provide no answer.

ANALYSIS

The results reveal a clear divide in confidence around the responsible use of AI/ML in mineral exploration. Trust levels are balanced almost evenly between those who believe the industry is acting prudently and those who remain skeptical. This polarization suggests that while confidence is growing, concerns persist, which may relate to whether organizations have the frameworks and culture needed to manage these technologies responsibly. Building broader trust may depend on the industry's ability to set clear standards and communicate how they are upheld through transparent and accountable use of AI/ML.

TRUST THAT AI/ML IS USED RESPONSIBLY

I trust the industry to use these tools responsibly.



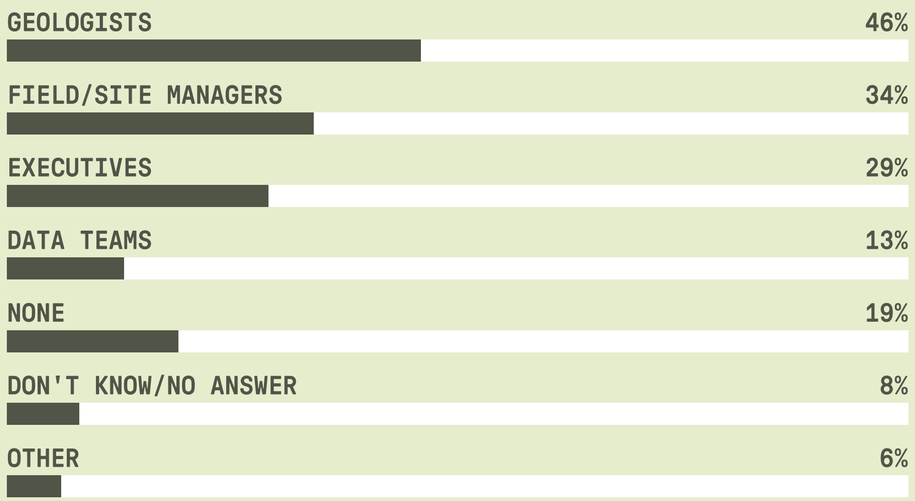
BASE: ALL RESPONDENTS (N = 135)

SURVEY QUESTION: TO WHAT DEGREE DO YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENT ABOUT THE USE OF NEW TECHNOLOGY, SPECIFICALLY ADVANCED OR EMERGING AI OR ML TOOLS? SELECT ONE RESPONSE.

MOST SKEPTICAL STAKEHOLDERS

Geologists are the group most frequently identified as skeptical about technology in exploration (46%), followed by field or site managers (34%) and executives (29%). Data teams are mentioned by 13% of respondents, while 6% point to other groups. Nearly one in five respondents (19%) say no internal stakeholders are skeptical, and 8% are unsure.

MOST SKEPTICAL STAKEHOLDERS ABOUT TECHNOLOGY IN EXPLORATION



BASE: ALL RESPONDENTS (N = 135)

SURVEY QUESTION: WHICH OF THE FOLLOWING INTERNAL STAKEHOLDER GROUPS ARE MOST SKEPTICAL ABOUT TECHNOLOGY IN EXPLORATION? SELECT ALL THAT APPLY.

ANALYSIS

Skepticism appears most common among geologists and field teams, that is, the groups most directly involved in day-to-day exploration activities. This pattern suggests that hesitation often arises from the practical realities of applying new tools to complex geological and field conditions. Executive skepticism, while less widespread, indicates that questions about value and risk persist even at senior levels. In contrast, the proportion reporting no internal resistance signals a subset of organizations where technology adoption is now viewed as routine rather than disruptive, hinting at a gradual cultural shift rather than entrenched opposition.

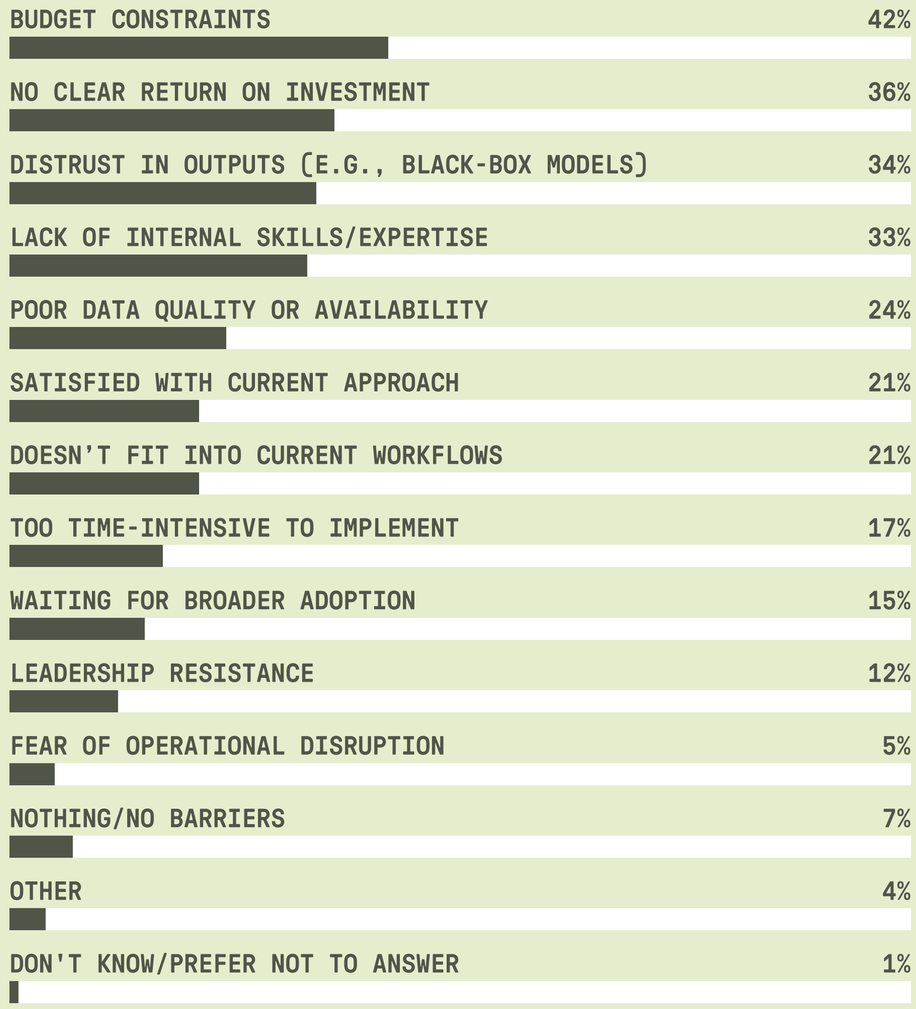
BARRIERS TO ADOPTION

Budget constraints are the most frequently cited barrier to adopting advanced or emerging AI/ML tools (42%), followed by a lack of clear ROI (36%). Distrust in model outputs is mentioned by 34% of respondents, and limited internal skills or expertise by 33%. Data quality or availability is identified as a barrier by 24%. Just over one in five cites satisfaction with current approaches (21%) or difficulty fitting new tools into existing workflows (21%), while 17% say implementation is too time-intensive and 15% are waiting for broader adoption across the industry. Smaller proportions report leadership resistance (12%), fear of operational disruption (5%), or other reasons (4%). Seven percent report no barriers, and 1% provide no answer.

ANALYSIS

The data suggests that hesitation around AI/ML adoption arises from a combination of financial caution and technical uncertainty. Budget limitations and unclear ROI dominate the picture, but concerns about model transparency and a shortage of in-house expertise reveal deeper issues of trust and capability. Poor data quality compounds these challenges, restricting the foundation needed to deploy AI effectively. These barriers appear closely tied to organizational readiness, with progress likely to depend on strengthening both technical capacity and internal frameworks.

BARRIERS TO ADOPTING ADVANCED/EMERGING AI/ML TOOLS



BASE: ALL RESPONDENTS (N = 135)

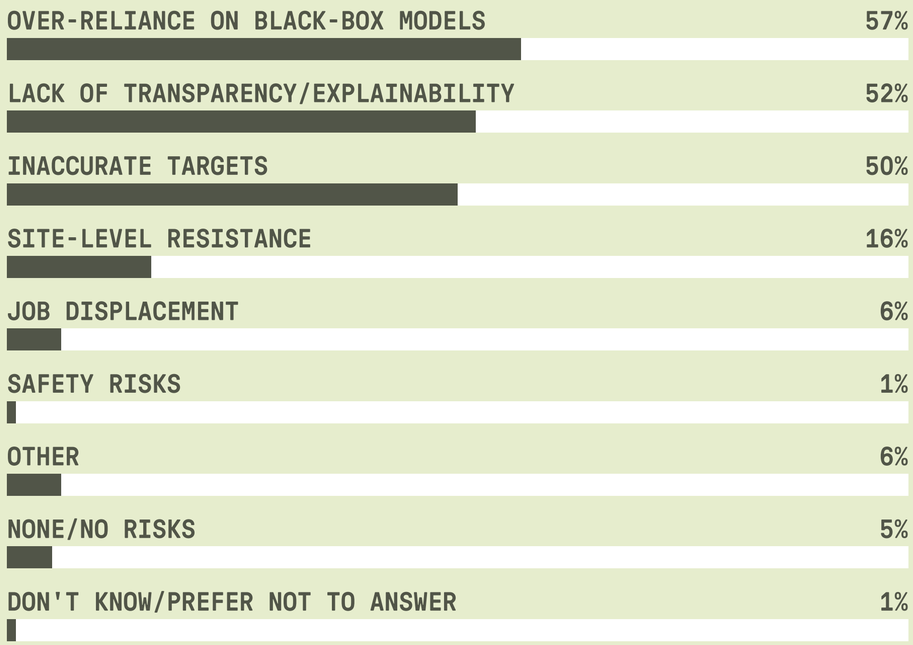
SURVEY QUESTION: WHICH OF THE FOLLOWING HAVE BEEN BARRIERS TO YOUR ORGANIZATION ADOPTING ADVANCED OR EMERGING AI OR ML TOOLS? SELECT ALL THAT APPLY.

PERCEIVED RISKS AND CONCERNS

Nearly six in ten respondents associate over-reliance on black-box models with risk in using advanced or emerging AI/ML tools (57%). Just over half name lack of transparency or explainability (52%), and half cite inaccurate targets (50%). Site-level resistance is mentioned by 16%, while 6% note job displacement and an equal share point to other risks. Only 1% mention safety concerns. A small minority say they see no risks (5%), and 1% are unsure or prefer not to answer.

The data shows an industry that is open to innovation yet deliberate in managing exposure to technological risk.

RISK OF USING ADVANCED/EMERGING AI/ML TOOLS



BASE: ALL RESPONDENTS (N = 135)

SURVEY QUESTION: WHICH OF THE FOLLOWING ARE RISKS YOU ASSOCIATE WITH USING ADVANCED OR EMERGING AI OR ML TOOLS IN EXPLORATION? SELECT ALL THAT APPLY.

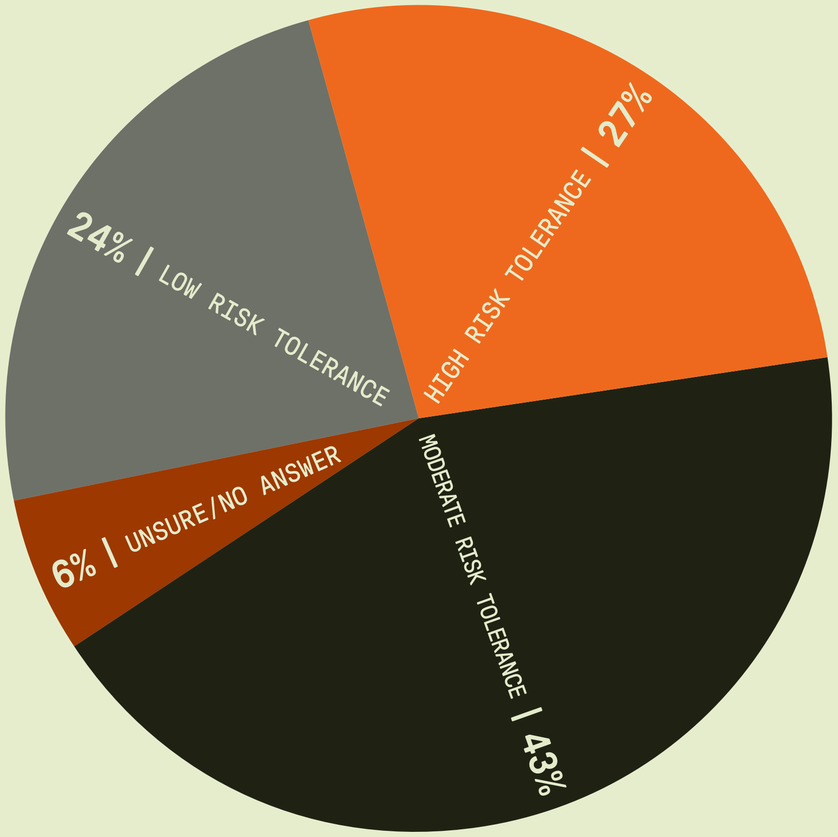
ANALYSIS

The response pattern suggests that risk is understood predominantly in terms of decision quality and defensibility. This emphasis mirrors the earlier barrier results, where distrust in AI/ML outputs and data issues emerge as notable concerns. By comparison, items such as site-level resistance and job displacement appear more as background complications than defining risks, which implies that worries about acceptance and staffing sit behind the more fundamental question of whether AI/ML tools can support sound exploration judgements.

RISK TOLERANCE

Organizations show varied levels of comfort with risk when it comes to adopting advanced or emerging AI/ML tools in exploration. Just over one-quarter (27%) describe their organization as having high risk tolerance. The largest share (43%) report moderate tolerance, while nearly one-quarter (24%) characterize their organization as having low tolerance. A small group (6%) say they do not know or provide no answer.

RISK TOLERANCE TO USING ADVANCED/EMERGING AI/ML TOOLS



BASE: ALL RESPONDENTS (N = 135)

SURVEY QUESTION: HOW WOULD YOU RATE YOUR ORGANIZATION'S RISK TOLERANCE WHEN IT COMES TO EXPLORATION TECHNOLOGY, SPECIFICALLY ADVANCED OR EMERGING AI OR ML TOOLS? SELECT ONE RESPONSE.

ANALYSIS

Most respondents position their organizations between caution and ambition. The prevalence of moderate tolerance indicates a willingness to explore new technologies, but within controlled limits. High tolerance is less common, reflecting that only a minority are prepared to assume significant uncertainty, while a similar proportion identify with low tolerance, signalling continued restraint. Taken together, the data shows an industry that is open to innovation yet deliberate in managing exposure to technological risk.

04 WHAT'S NEXT

OUTCOMES AND CONFIDENCE IN THE FUTURE OF AI/ML

SECTION

A

Outcomes Since Adopting

SECTION

B

Outlook for Future Benefits

OUTCOMES SINCE ADOPTING

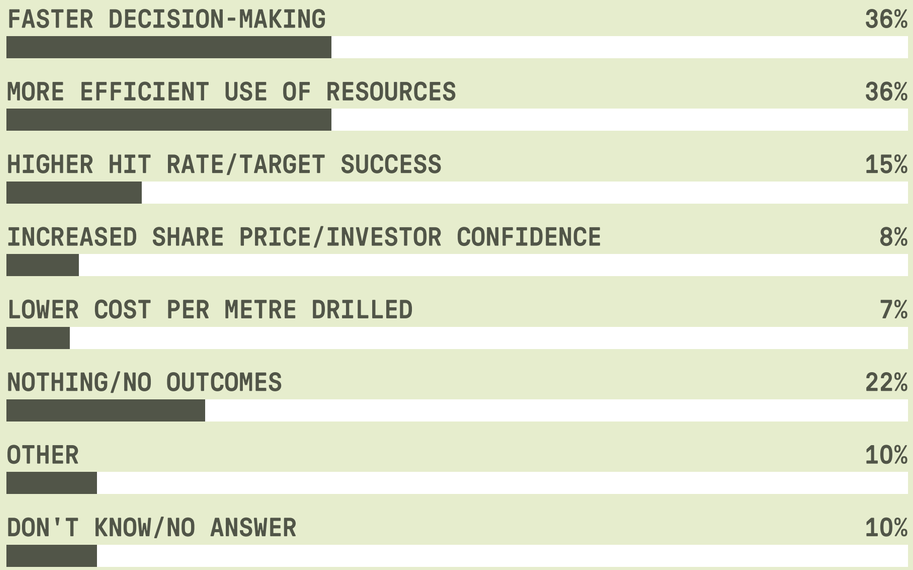
The most frequently reported outcomes of adopting advanced or emerging AI/ML tools are faster decision-making and more efficient use of resources, each cited by 36% of respondents. A higher hit rate or target success follows at 15%, while 8% point to increased share price or investor confidence and 7% to lower cost per metre drilled. Ten percent mention other outcomes, with an equal proportion unsure or giving no answer, and 22% report no observable results.

Respondents reported improvements related to efficiency and decision speed, suggesting that current applications are enhancing workflow performance.

ANALYSIS

The responses indicate that AI/ML adoption is delivering immediate process-level benefits more often than financial or discovery-related gains. Most reported improvements relate to efficiency and decision speed, suggesting that current applications are enhancing workflow performance rather than transforming exploration outcomes. The considerable proportion reporting no outcomes suggests that results remain uneven across organizations and that measurable impact may depend on both the maturity of implementation and the quality of underlying data.

OUTCOME SINCE ADOPTING ADVANCED/EMERGING AI/ML TOOLS



BASE: HAS ADOPTED EXPLORATION TECHNOLOGY (N = 116)

SURVEY QUESTION: WHICH OF THE FOLLOWING OUTCOMES HAVE YOU OBSERVED SINCE ADOPTING ADVANCED OR EMERGING AI OR ML TOOLS? SELECT ALL THAT APPLY.

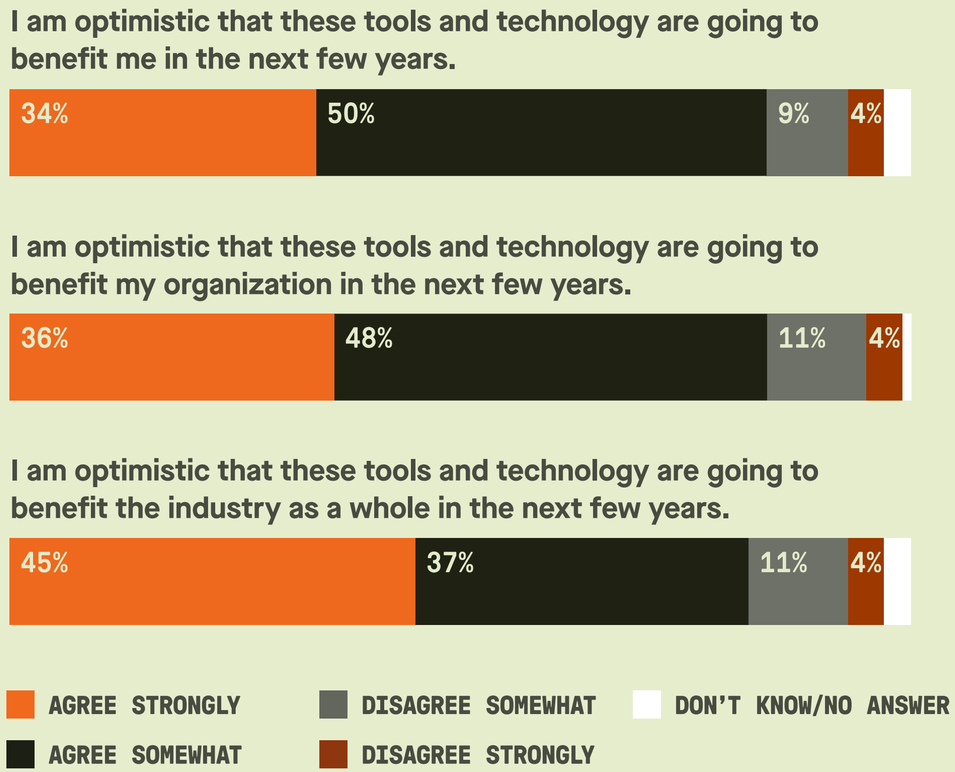
OUTLOOK FOR FUTURE BENEFITS

A large majority of respondents express optimism that advanced or emerging AI/ML tools will deliver benefits across multiple levels. Eighty-four percent agree that these tools will benefit them personally in the next few years (34% strongly), and the same share expect advantages for their organization (36% strongly). Optimism extends to the industry as a whole, with 82% in agreement and the highest level of strong endorsement (45%). Disagreement is limited, ranging from 13% to 15%.

ANALYSIS

Confidence in AI/ML is most pronounced when respondents consider the broader industry, suggesting they view sector-wide transformation as more certain than immediate personal or organizational gains. The near-identical optimism at individual and organizational levels indicates consistent expectations for improvement, though with slightly less intensity than the outlook for the industry overall.

OPTIMISM TOOLS WILL BENEFIT SELF, ORGANIZATION AND INDUSTRY



BASE: ALL RESPONDENTS (N = 135)

SURVEY QUESTION: TO WHAT DEGREE DO YOU AGREE OR DISAGREE WITH EACH OF THE FOLLOWING STATEMENTS ABOUT THE USE OF NEW TECHNOLOGY, SPECIFICALLY ADVANCED OR EMERGING AI OR ML TOOLS? SELECT ONE RESPONSE PER ITEM.

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CONCLUSION

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CONCLUSION

The mineral exploration industry has strong digital foundations, but mainstream AI/ML use remains in its nascent stages.

Core tools such as geological databases and GIS are widely used, whereas regular AI/ML-based targeting is considerably less common and usually supported by modest exploration budgets. Adoption has grown steadily rather than dramatically over years, with mid-sized organizations (51–1,000 employees) showing the most consistent use and both smaller companies (1–50 employees) and larger enterprises (1,000+ employees) being more often limited to pilots or isolated pockets.

Across the sample, the main obstacles cluster around cost and confidence, with respondents pointing to financial implications and mistrust of model outputs, underpinned by broader capability concerns. Skepticism is most often associated with geologists and field/site managers, while functional specialists are the most frequent users and senior decision-makers at both organizational and technical levels engage more selectively. Many describe organizations that talk about innovation yet, to a lesser extent, reward risk-taking or link AI/ML use clearly to performance, which helps explain why experimentation is common but full adoption remains limited. Perceptions appear to shift most when teams can combine credible peer case studies with direct experience from their own pilots, supported by a more concrete view of expected ROI.

In terms of the outcomes of AI/ML use in exploration, respondents most often highlight faster decision-making and more efficient use of resources. Direct effects on traditional exploration performance or investor metrics are reported less often, and more than one fifth still observe no clear impact. Even so, large majorities expect AI/ML to deliver benefits that extend from their own work through their organizations to the industry as a whole.

Overall, the findings describe an industry that is technically capable and broadly optimistic about AI/ML, yet still transitioning from early trials toward dependable practice. Continued progress will likely depend on stronger data foundations and skills around these tools, alongside more transparent systems and a more open approach to sharing credible results.

OUR FINAL THOUGHTS

When we set out to conduct this survey and produce this report, we weren't entirely sure what we would uncover. But we knew it was work worth doing. We saw an opportunity to build not only a broader base of shared information, but perhaps more importantly, a clearer picture of where the industry stands today, where it hopes to go, and what may be holding it back.

Working with clients across commodities, stages, and geographies gives us valuable anecdotal insight, but it can be difficult to connect those individual experiences into a cohesive, industry-wide understanding. So in short, that's what brought us to what you have just read — something we hope provides insights and context that will propel the entire industry into the next era of exploration and discovery.

OUR FINAL THOUGHTS

Though the industry continues to navigate rapid change, volatile market cycles, and the influence of a new generation of geoscientists, what we've found throughout this process is optimism:

Widespread Belief in Future Benefits

Respondents largely expect AI/ML to positively impact their work, their organizations, and the industry as a whole in the coming years.

A Strong Industry Appetite for Innovation

Across all company sizes, teams overwhelmingly agree that innovation is essential and worth pursuing.

Growing Momentum in Adoption

A solid base of early adopters, together with a sizable cohort of more recent users, signals that AI/ML is moving beyond experimentation and toward broader integration.

Early Operational Gains

Over a third of adopters report tangible workflow improvements, indicating that AI/ML is beginning to deliver value in day-to-day exploration.

Clear Demand for Advanced Tools

Technologies like AI-driven targeting, improved data management, and collaborative platforms are among the sector's top priorities.

Closing Reflection

Seeing optimism reflected in the responses has been the most rewarding part of this work. And while not every signal is positive, it's clear that the industry's passion and drive will continue to push it forward.


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