

Market Insight: From Fragmented Systems To Industrial Agility – The Rise Of Industrial AI Analytics

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Industrial firms depend on the ability to see what is happening across operations – and to act quickly. Data fragmentation across industrial systems and difficulty in mastering specialist analytical tools undermine this capability. Current workarounds compound the challenge. Between 35% and 55% of critical technical activities rely on proprietary software, creating ongoing maintenance challenges and limiting knowledge transfer. Industrial AI analytics creates a connected decision layer spanning operational technology (OT) and IT systems, enabling engineers to convert data into actionable insight at scale. When embedded within engineering workflows, AI accelerates investigation while preserving human judgement. Decision-makers should prioritize a connected analytics decision layer that scales engineering expertise, operationalizes proprietary knowledge and enables faster, more collaborative decision-making across the enterprise.

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Organizations mentioned

ABB, Augury, Avathon, AVEVA, C3 AI, Cenosco, Emerson, Dimension Software, Honeywell Technologies, IBM, Imubit, Optimistik, Seeq, Siemens, Spotfire, SymphonyAI, TrendMiner, Uptake, UptimeAI, Yokogawa.

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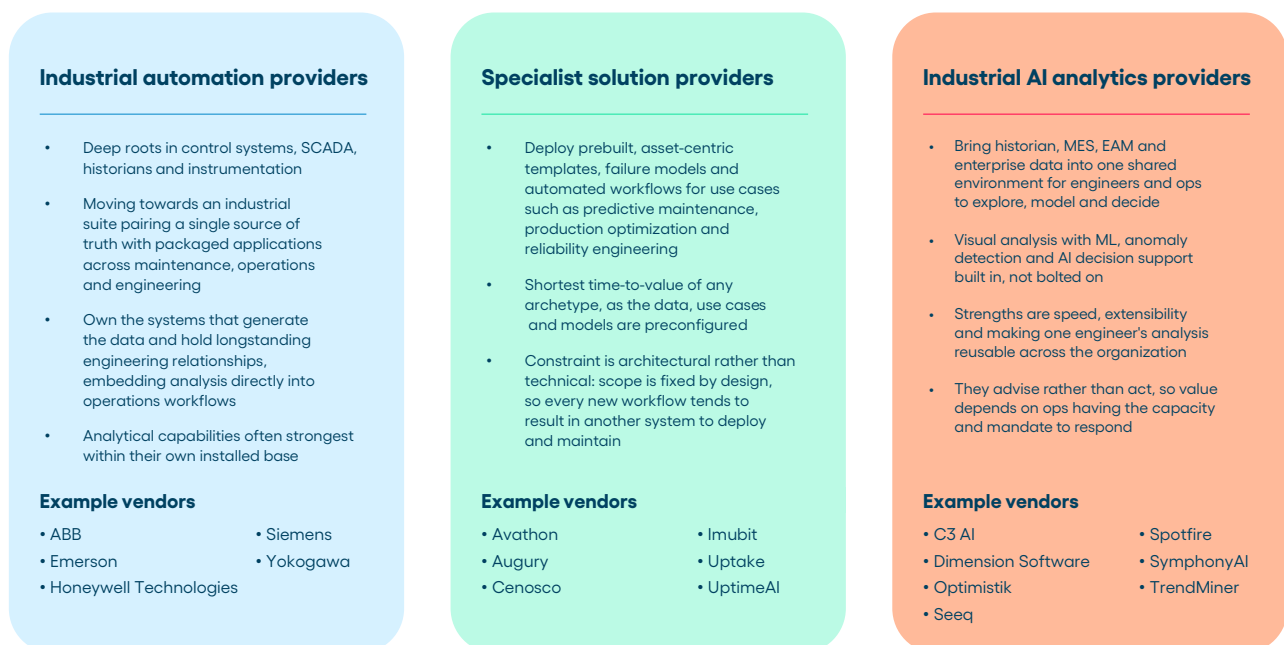
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Summary for decision-makers

- Industrial leaders responsible for engineering, maintenance and operations are struggling to turn growing volumes of operational data into timely decisions, due to fragmented systems, complex analytical tools and reliance on proprietary software. This report explains how industrial AI analytics can create a connected decision layer that scales expertise, accelerates investigations and improves enterprise-wide decision-making.
- Engineering, maintenance and operations teams should use industrial AI analytics to embed AI within existing workflows, automate recurring analyses and make specialist knowledge easier to capture and reuse.
- This report is based on survey data of 51 professionals working in engineering and operations functions at firms in the process manufacturing, oil and gas, utilities, and mining, metals and minerals sectors. The report includes original Verdantix research into industrial analytics, AI adoption and operational decision-making.
- Data fragmentation and tool complexity continue to limit industrial agility, with most firms struggling to solve problems across systems and functions.
- Many organizations rely on in-house software to capture proprietary expertise, but this creates ongoing maintenance and scalability challenges.
- Leading firms will adopt AI-enabled platforms that combine cross-system data, industry-specific workflows and proprietary knowledge to drive faster, more collaborative decisions.

Figure 4
Vendor archetypes



Source: Verdantix analysis



Industrial AI analytics: an enabler for industrial agility

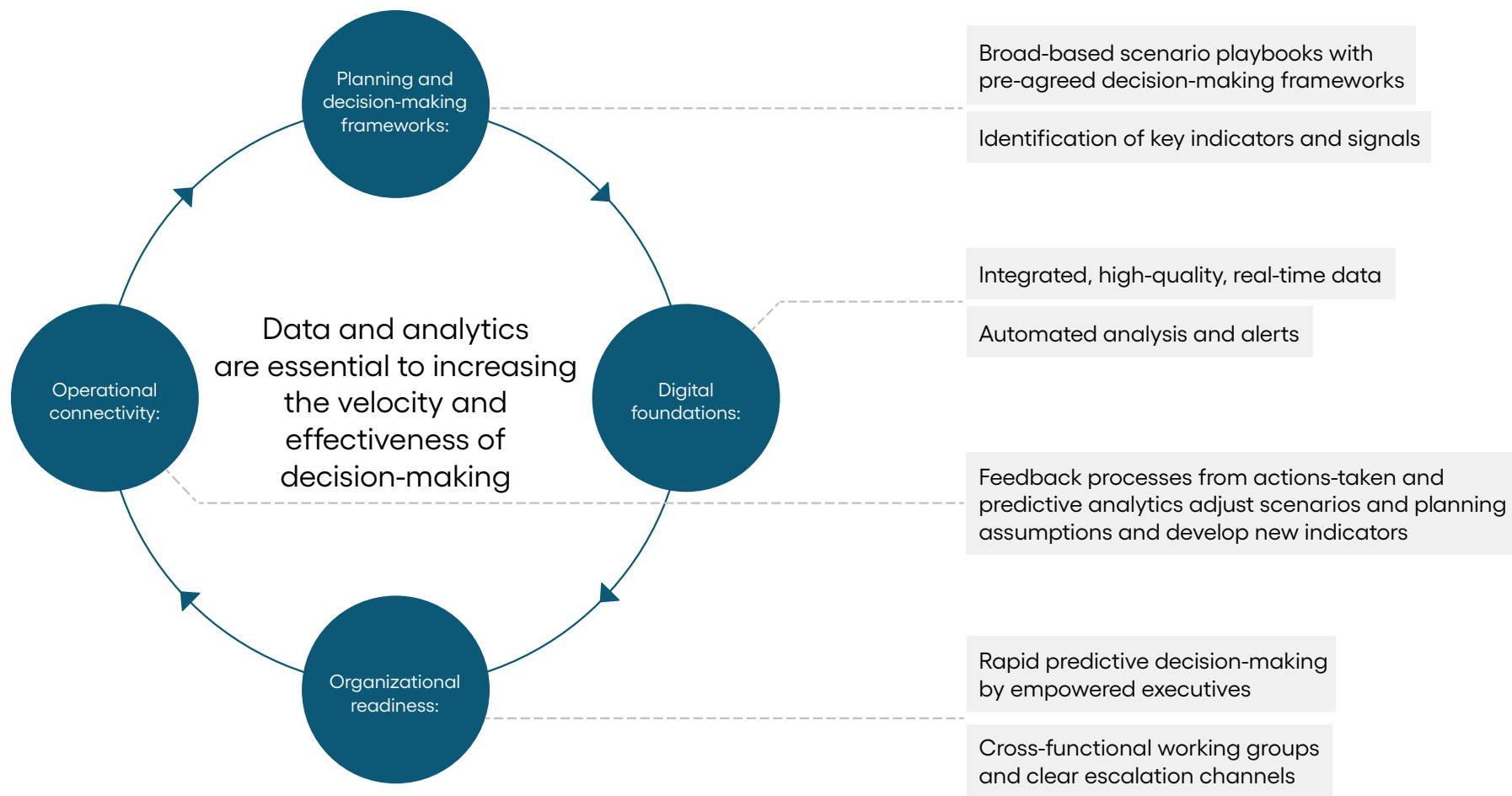
Industrial organizations are operating in an environment defined by increasing complexity, disruption and pressure to make faster decisions. With data fragmented across systems, and difficulty in mastering specialist analytical tools, the ability to see what is happening across operations, and to act with the requisite speed, is undermined. Moreover, while the value of AI is now widely recognized, many firms lack the expertise and technology foundations needed to develop AI capabilities independently. With generic tools often failing to reflect how industrial experts actually work, organizations continue to rely heavily on proprietary methods, specialist workflows and in-house-developed software. Leading firms are now looking for platforms that combine the simplicity of packaged solutions with the flexibility to operationalize their own intellectual property (IP). Those that succeed will be better-positioned to apply AI, accelerate problem-solving and enable more collaborative decision-making across the organization. To investigate factors affecting decision-making and cross-functional problem-solving at industrial firms, Verdantix conducted a survey of 51 professionals working in engineering and operations functions at firms in the process manufacturing, oil and gas, utilities, and mining, metals and minerals sectors.

Industrial AI analytics boost industrial agility

In response to expanding complexity and disruption, and pressure to make decisions more speedily, a growing class of solutions – industrial AI analytics – is emerging, to help engineers and operators transform data into actionable decisions at scale. Verdantix research finds that:

- **Industrial AI analytics boost industrial agility by supporting organizational decision-making.**
Every industrial firm, whatever it produces and wherever it operates, depends on the same underlying capability: seeing what is happening across its operations and acting on it quickly enough to matter. This is what allows firms to protect uptime, operate safely, and hold yield and cost steady under conditions that change faster than their planning cycles. Verdantix describes this capability as ‘industrial agility’: the ability to detect disruption early, understand its implications, and take action under changing conditions with speed and precision (see **Figure 1**). Industrial AI analytics is increasingly being used to support these goals.
- **Production systems are augmented by industrial AI analytics.**
Verdantix defines industrial AI analytics as applications that bring together operational technology (OT) and information technology (IT) data, both structured and unstructured, from across the systems a firm already runs. These applications combine human data exploration with learned pattern recognition and reasoning to deliver insight that engineering, maintenance and operations teams can act on – highlighting anomalies, explaining why they occur, predicting asset failure, optimizing processes and completing open-ended, multi-step tasks. Instrumentation and connected assets are generating operational data in greater volumes than ever, but site engineers frequently lack the tools to turn these data into timely decisions.
- **Awareness of industrial AI analytics is rising, but market penetration remains subdued.**
Many firms report limited in-house AI expertise and technology environments that are not yet equipped to support AI-driven initiatives. Industrial AI analytics software and solutions aim to close this gap by putting analytical capabilities into the hands of the engineers who already understand the process. Unlike widely adopted technologies such as enterprise asset management (EAM) solutions and manufacturing execution systems (MESs), industrial AI analytics remains relatively immature in terms of awareness, understanding of its business value, and market penetration, leaving significant room for future growth. While 88% of respondents to our industrial AI analytics survey report at least some exposure to industrial AI analytics, only 20% say it is widely used across engineering departments, while 35% report use by some teams, and 33% are piloting initiatives (see **Figure 2**).

Figure 1
Industrial agility in action



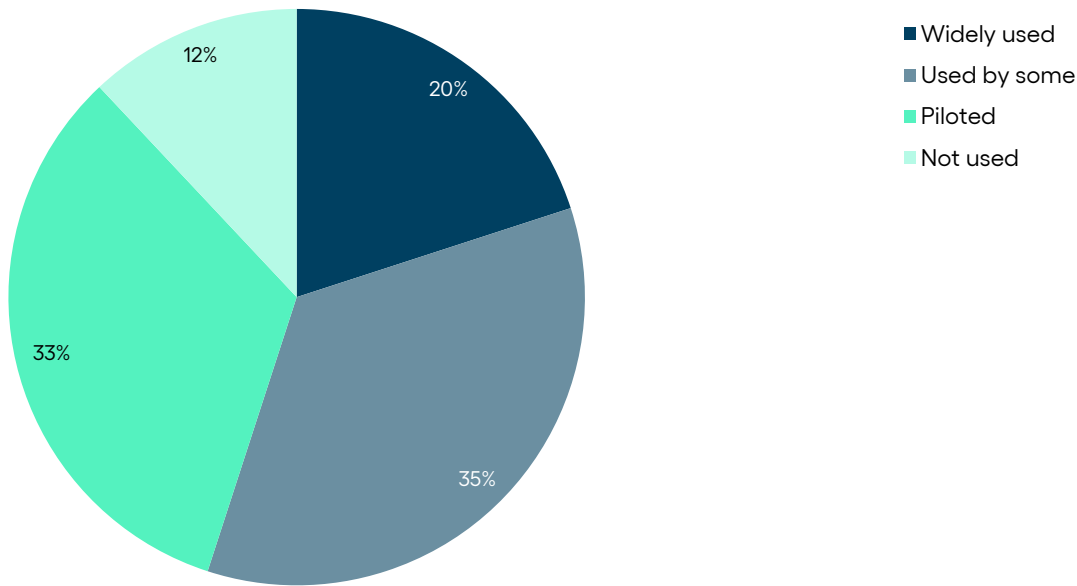
Source: Verdantix analysis



Figure 2

Prominence of industrial AI analytics in engineering departments

How widely is industrial AI analytics problem-solving employed across your engineering departments?



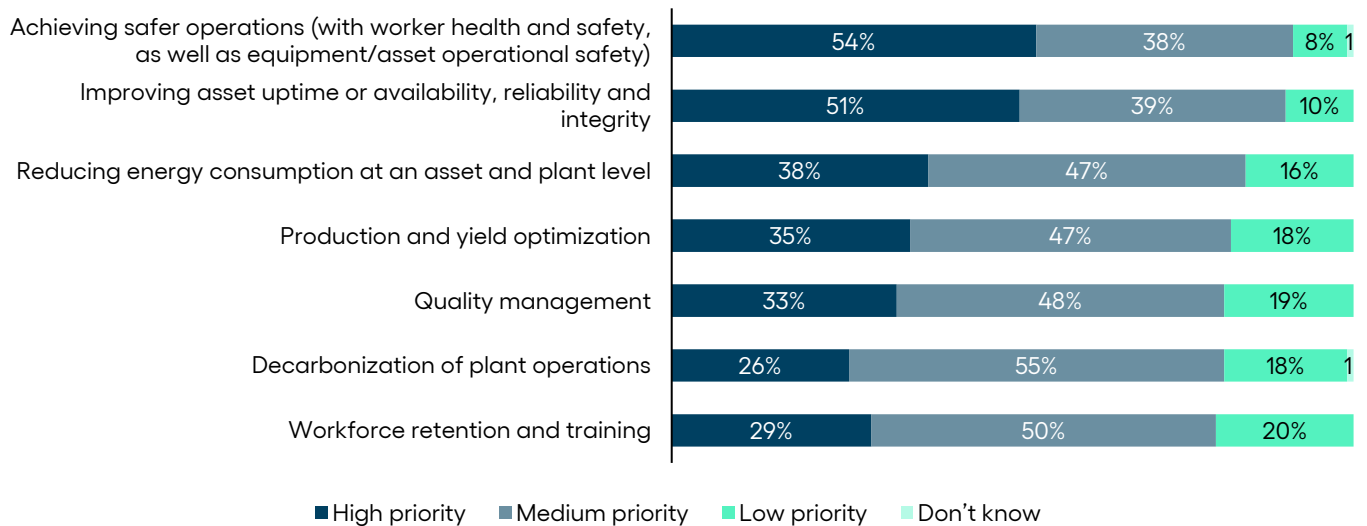
Note: Data labels are rounded to zero decimal places.
Source: Verdantix Industrial AI Analytics Survey 2026

N=51

Figure 3

Industrial transformation priority initiatives

To what extent are the following initiatives a priority for your firm over the next 12 months?



Note: Data labels are rounded to zero decimal places; percentages less than 5% are written as numbers.
Source: Verdantix Global Corporate Industrial Transformation Survey 2026

N=333



Figure 4
Vendor archetypes

Industrial automation providers

- Deep roots in control systems, SCADA, historians and instrumentation
- Moving towards an industrial suite pairing a single source of truth with packaged applications across maintenance, operations and engineering
- Own the systems that generate the data and hold longstanding engineering relationships, embedding analysis directly into operations workflows
- Analytical capabilities often strongest within their own installed base

Example vendors

- ABB
- Emerson
- Honeywell Technologies
- Siemens
- Yokogawa

Specialist solution providers

- Deploy prebuilt, asset-centric templates, failure models and automated workflows for use cases such as predictive maintenance, production optimization and reliability engineering
- Shortest time-to-value of any archetype, as the data, use cases and models are preconfigured
- Constraint is architectural rather than technical: scope is fixed by design, so every new workflow tends to result in another system to deploy and maintain

Example vendors

- Avathon
- Augury
- Cenosco
- Imubit
- Uptake
- UptimeAI

Industrial AI analytics providers

- Bring historian, MES, EAM and enterprise data into one shared environment for engineers and ops to explore, model and decide
- Visual analysis with ML, anomaly detection and AI decision support built in, not bolted on
- Strengths are speed, extensibility and making one engineer's analysis reusable across the organization
- They advise rather than act, so value depends on ops having the capacity and mandate to respond

Example vendors

- C3 AI
- Dimension Software
- Optimistik
- Seeq
- Spotfire
- SymphonyAI
- TrendMiner

Source: Verdantix analysis



- **Top operational priorities create a clear role for AI-driven decision-making support.**

Verdantix survey data show that asset uptime, safer operations, energy reduction and production yield optimization rank among the top operational priorities for industrial firms over the next 12 months (see **Figure 3**). Industrial AI analytics has a clear role to play in addressing these priorities. It helps engineers choose appropriate analytical approaches, automate recurring analyses and derive greater value from their existing software investments. AI is what makes that practical at scale, surfacing patterns across more data than a team could examine and suggesting where to look next. In this sense, industrial AI analytics is not another standalone tool, but the decision layer on which industrial agility depends, drawing value from the operational systems firms have already deployed.

- **Industrial AI analytics vendor landscape is rapidly evolving.**

This market is still taking shape, defined not by a handful of dominant platforms, but by a diverse set of vendor archetypes, three of which account for most of the market today (see **Figure 4**). Established automation and enterprise software vendors such as ABB, AVEVA, Emerson, Honeywell Technologies, IBM and Siemens carry significant installed base advantages and are extending their portfolios into analytics and AI-driven decision support. Alongside them, specialist solution providers such as Augury, Imubit and Uptake, and industrial AI analytics providers such as Seeq, Spotfire and TrendMiner, are expanding the market, each bringing distinct capabilities.

- **Fragmented vendor landscape makes vendor selection a strategic decision.**

Brand recognition across the market remains relatively low, reflecting both the emerging status of industrial AI analytics as a distinct category and the breadth of vendors active in the space. For industrial leaders, the practical question is how to weigh what each group offers and then determine which is most likely to deliver industrial agility – and how quickly. Each archetype arrives from a different starting point, and the strengths that define each one also set its limits.

Industrial software fragmentation is holding firms back from true industrial agility

Firms pursuing industrial agility find themselves in a difficult position. Decades of technology investment have created a landscape of powerful but disconnected systems and siloed data that continues to limit visibility, collaboration and operational responsiveness. Verdantix finds that:

- **Most industrial firms still fall short of true industrial agility.**

Even industrial firms that have spent years integrating software across production and maintenance workflows remain partway through that journey. They have been working towards continuous asset health intelligence to anticipate failures; real-time production visibility to address bottlenecks; supply transparency to identify risks; and robust energy and emissions management – but few have achieved these together. Systems for production, engineering, maintenance, quality and asset performance have been deployed in parallel, creating islands of data and disconnected workflows, rather than an integrated ecosystem (see **Figure 5**). MES platforms such as Siemens Opcenter, EAM suites such as IBM Maximo Application Suite, and asset performance management (APM) tools like AVEVA APM remain essential foundations, yet they operate as siloed systems.

Figure 5
Industrial system overview



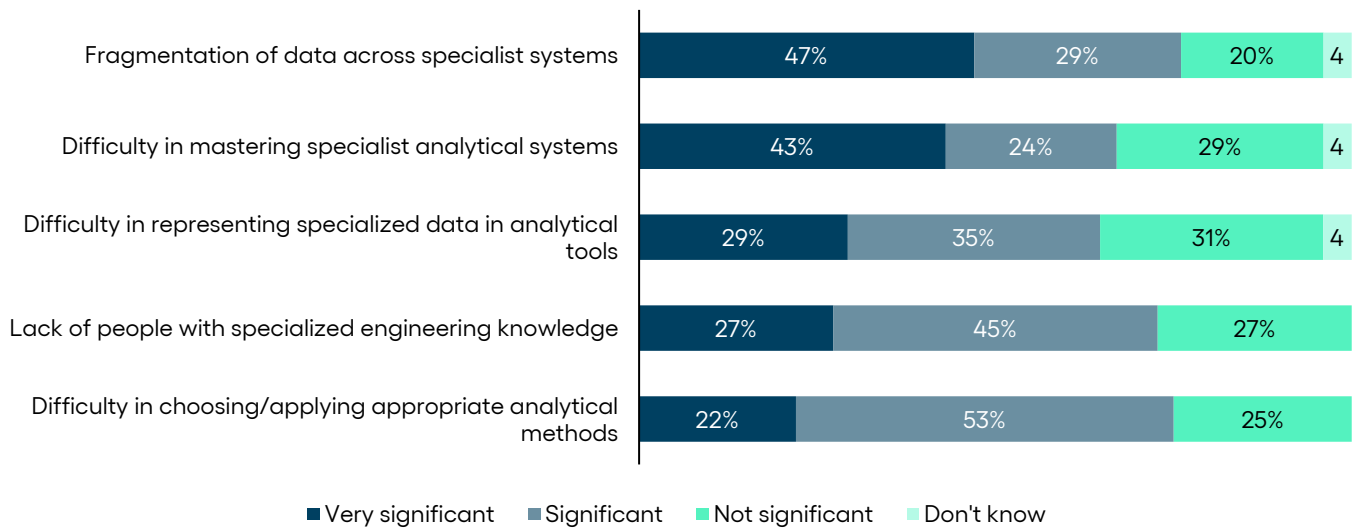
Note: Systems in grey are not covered in core Verdantix research.
Source: Verdantix analysis



Figure 6

Analytical problem-solving limitations/blockers

How significant are these limitations/blockers for cross-functional analytical problem-solving in your organization?



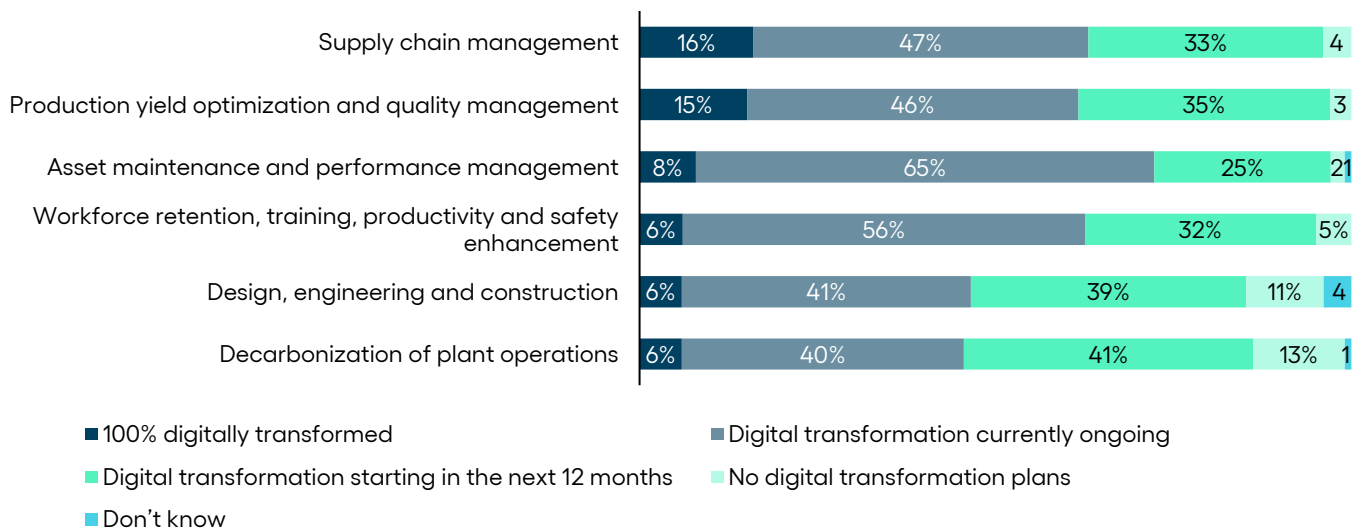
Note: Data labels are rounded to zero decimal places; percentages less than 5% are written as numbers.
Source: Verdantix Industrial AI Analytics Survey 2026

N=51

Figure 7

Digital transformation of industrial activities

Which statement best describes your firm's approach to digital transformation for the following activities?



Note: Data labels are rounded to zero decimal places; percentages less than 5% are written as numbers.
Source: Verdantix Industrial Transformation Survey 2026

N=333



- **Data fragmentation and tool complexity limit firms' ability to solve problems across functions.**

Our survey data reinforce this fragmentation challenge. Some 76% of respondents identify fragmented data across specialist systems as a 'significant' or 'very significant' blocker to cross-functional analytical problem-solving, and 67% report that specialist analytical tools are difficult to master (see **Figure 6**). This reveals a dual constraint. The systems that produce the data also keep it separate, and too few people can use the specialist tools built to analyse it. Both follow from the nature of specialization itself. A system built to do one thing exceptionally well is optimized for its own domain rather than for what sits beside it, and the depth that makes it valuable is also what draws its boundary. In addition, the survey data confirm that only a small proportion of industrial firms have modernized their operations end-to-end (see **Figure 7**).

Specialized tools deliver depth, but limit agility and a firm's own way of working

Fragmentation is only part of the challenge. Even where digital technologies are in place, many industrial firms continue to rely on proprietary tools, manual processes and the personal expertise of individual engineers to solve critical operational problems, revealing important gaps that existing software has yet to address. The difficulty is that traditional options solve only part of the problem. Our research indicates that:

- **In-house software encodes valuable IP, but the burden of sustaining it falls fully on the firm.**

Some of the operational gaps are filled ad hoc, with spreadsheets or pen and paper. The more consequential case is deliberate. In-house-developed software supports between 35% and 55% of technical activities overall, such as root-cause analysis, anomaly detection and yield analysis (see **Figure 8**). This reliance is not simply due to missing product features in existing solutions. Firms build this software to embed their unique knowhow, including specialized calculations, engineering practices, analytical techniques and workflows that set them apart from competitors – and which are not available in standard off-the-shelf solutions. Consistent with this, 64% of respondents report having proprietary methods and work processes they wish to standardize (see **Figure 9**).

- **Organizations need scalable platforms to reduce the upkeep burden of in-house software.**

As data volumes grow and decision cycles shorten, the patchwork of in-house-developed software, specialist systems, statistical packages and manual workarounds becomes a source of vulnerability and carries a cost that is rarely taken into account when it is built. Every in-house-developed application must be maintained, validated and supported for as long as it is relied upon, usually by engineers whose primary role is not software development, and often long after the original author has moved on. No vendor stands behind it: there is no roadmap, no support contract, and no external party in a position to assure quality, accuracy or continuity. This presents a significant challenge. Organizations need platforms capable of scaling their IP and specialist knowledge without developing and maintaining custom solutions themselves.

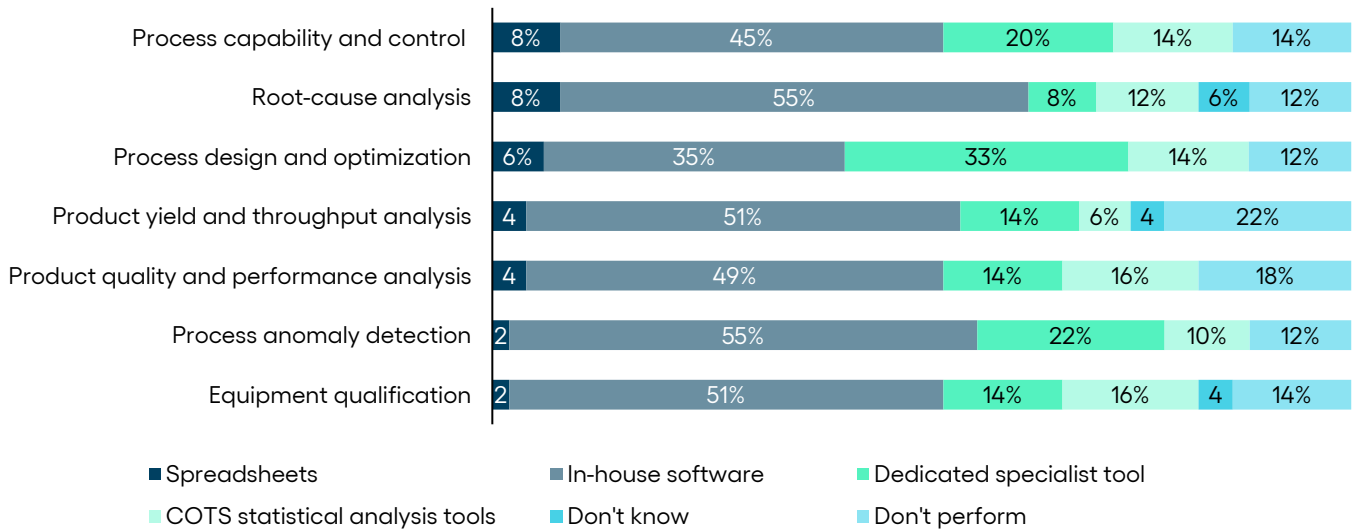
- **General-purpose accessibility is not enough without industry-native visualizations and algorithms.**

When firms do move beyond spreadsheets, general-purpose analytics tools often fall short. Effective industrial analytics must combine intuitive accessibility with industry-native visualizations and algorithms, while supporting more advanced analytical workflows for technical users. An industry-native environment embeds the discipline's conventions in both what it draws and what it computes. It renders control limits and violation rules on process charts, adjusts pump curves relative to best efficiency, marks batch campaigns and maintenance events on a time series, and groups failure modes in the way in which reliability engineers organize them. Metrics such as Cpk (process capability index), first-pass yield and defect density recalculate as the analysis is filtered, consistently reflecting the definitions the industry already uses.

Figure 8

Approaches to technical activities

How do your teams perform each of the following technical activities today?



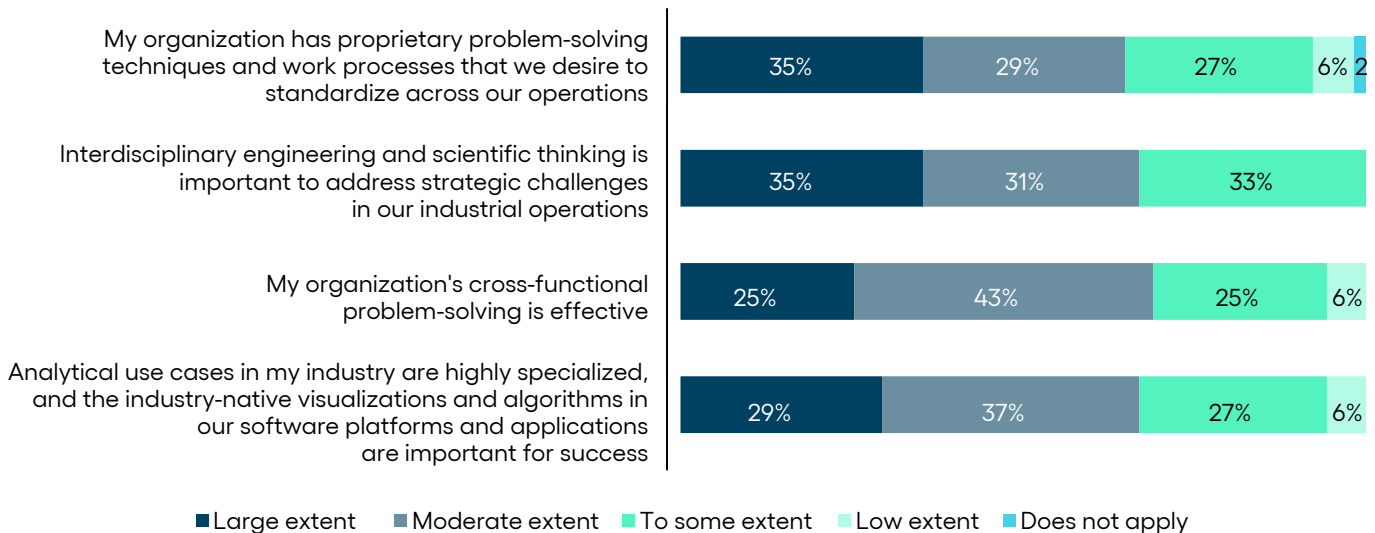
Note: Data labels are rounded to zero decimal places; percentages less than 5% are written as numbers.
Source: Verdantix Industrial AI Analytics Survey 2026

N=51

Figure 9

Cross-functional problem-solving and industry-native analytics

To what extent do these statements apply to your organization?



Note: Data labels are rounded to zero decimal places; percentages less than 5% are written as numbers.
Source: Verdantix Industrial AI Analytics Survey 2026

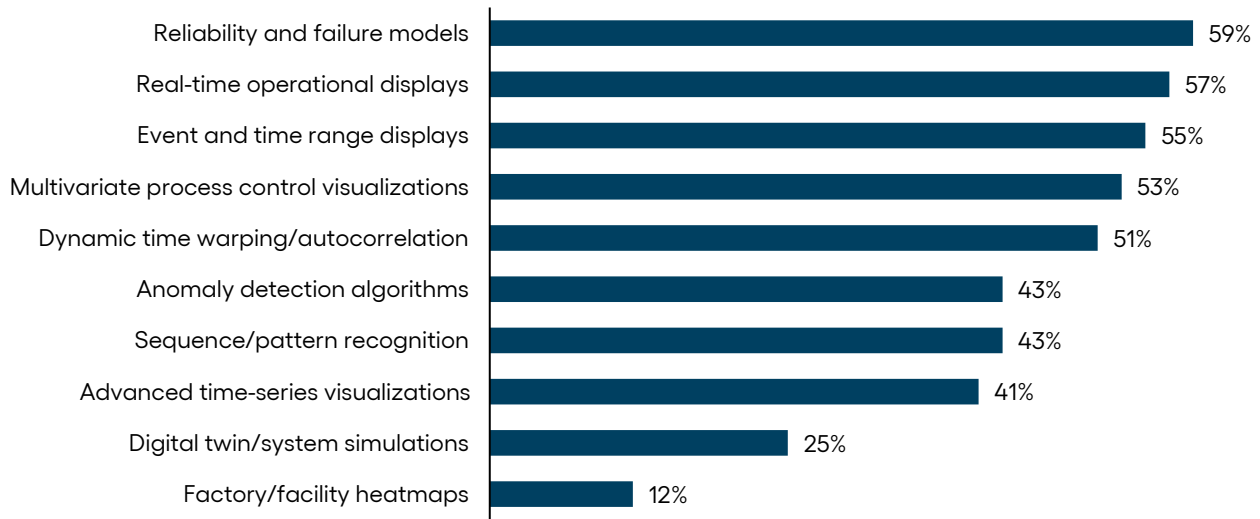
N=51



Figure 10

Specialized algorithms and visualizations

Which specialized algorithms and visualizations are used or desired by your teams?



Note: Data labels are rounded to zero decimal places.

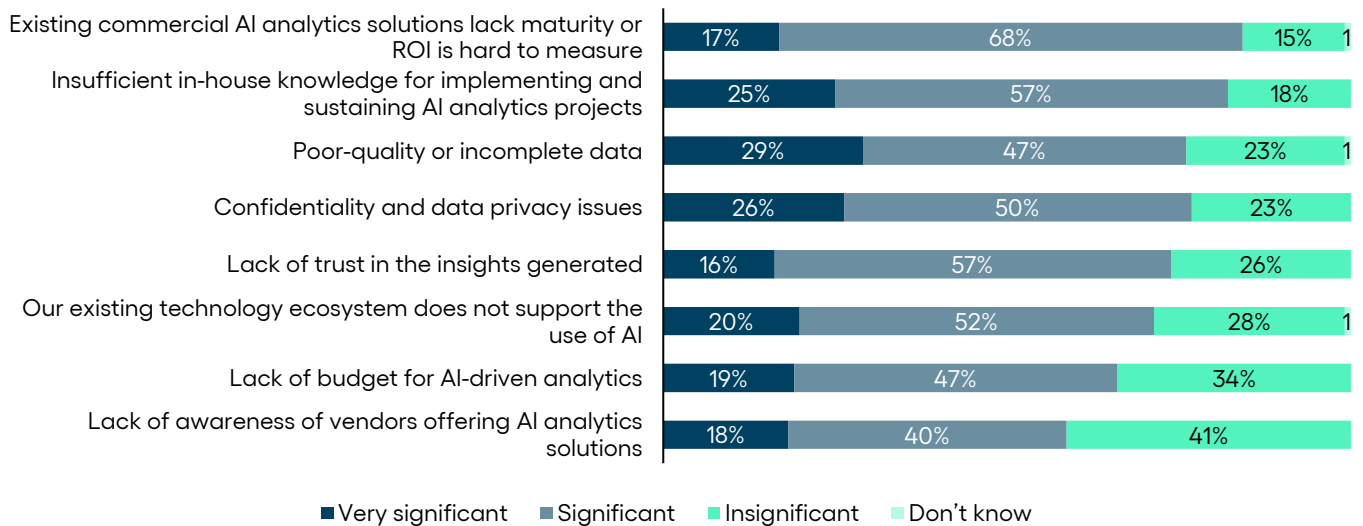
Source: Verdantix Industrial AI Analytics Survey 2026

N=51

Figure 11

Barriers impacting the success of industrial AI analytics projects

How significant are the following barriers to the success of your industrial AI analytics projects?



Note: Data labels are rounded to zero decimal places; percentages less than 5% are written as numbers.

Source: Verdantix Industrial Transformation Survey 2026

N=333



- **Domain-specific capabilities and real-world operational context are critical for success.**

The survey data are clear: 66% of respondents say that interdisciplinary engineering and scientific thinking are important for strategic industrial challenges, and an equal proportion describe industry-native visualizations and algorithms as critical for success (see **Figure 9**). Respondents also prioritize operationally focused capabilities, such as reliability and failure models (59%), real-time operational displays (57%), event and time range displays (55%) and multivariate process-control visualizations (53%) (see **Figure 10**). The strong demand for event and time range displays suggests that industrial teams value understanding operational context, process history and changing conditions over time. Analytics environments must support investigation and decision-making within a real-world operational context, rather than simply presenting static reports.

- **AI magnifies engineering expertise only when it is embedded in the analysis.**

Where AI is embedded determines how much of its value reaches the decision-making process. On its own, AI can interrogate a dataset, generate code and return a plausible answer, but the answer arrives detached. It is drawn in generic form and is static once produced, resting on methods it improvised and confined to the session that produced it. When embedded in an analytics environment that spans operational systems, however, AI works alongside the engineer, rather than around them. It can draw on validated statistical methods and industry-native views, while keeping analyses live and interactive so they can be pursued further. The analytical approach can then be captured, shared, governed and reused across future investigations.

- **AI can accelerate problem-solving while keeping engineers in control.**

Industrial problem-solving is rarely a matter of producing a single answer. Engineers work through a space of possible explanations, testing each against what they know about the process and following the evidence wherever it leads. AI is well-suited to that kind of work, but only when operating within an engineering work process. It can scan far more data than a person, surface candidate explanations and suggest what to examine next. It can also act on those suggestions, operating the analytical tools of the environment and helping to interpret what comes back. In doing so, it shortens the search while leaving the judgment with the engineer who understands the process.

- **Capturing and reusing expertise is essential to realizing AI analysis value.**

The cost of getting this wrong is shown in the survey data. A majority of respondents cite budget constraints and hard-to-measure return on investment (ROI) among the barriers to industrial AI analytics projects (see **Figure 11**), and 84% say that automating recurring analyses for common industry problems would be valuable (see **Figure 13**), implying that a considerable amount of analytical work is rebuilt by hand each time it is needed. Expertise that is captured once and applied repeatedly is easier to value than expertise that has to be reassembled for every investigation.

What industrial leaders should do next to unlock industrial agility

The findings so far point to a common conclusion: the challenge is not acquiring more data or deploying more isolated software tools. Instead, industrial organizations must focus on connecting insights, expertise and decisions across the enterprise in ways that translate analytical potential into operational outcomes. Industrial leaders should:

- **Prioritize a connected analytics decision layer over additional standalone tools.**

Industrial firms need an analytics layer that sits across fragmented operational systems, connecting insight from disparate data sources into a shared decision environment. Most respondents highlight operations management (67%), process engineering (65%) and equipment engineering (57%) as key collaborative functions (see **Figure 12**). Rather than adding another siloed tool, leaders should evaluate platforms that bridge data, context and domain expertise across production, engineering and asset management workflows. Such a layer sits above existing data infrastructure, reading information from the systems that already hold it (such as an historian) and relating it to common keys such as asset, time, batch or product,

so that questions can be asked across sources rather than within one. AI orchestrates the analytical tools in that environment, suggests where to look next and helps the engineer interpret what comes back, removing the need to rebuild models for the next investigation. Some 91% of respondents say that blending data from disparate systems to find relationships would be helpful, and 84% point to automating recurring analyses (see **Figure 13**).

- **Invest in tools designed for the way that industrial experts actually operate.**

Platforms that combine visual exploration, industry-native workflows and explainable AI enable engineers and operational teams to identify risks earlier and move confidently from analysis to action without relying on centralized data science teams. Our survey also highlights an important capability challenge. While firms increasingly recognize the value of AI-driven decision support, many are not positioned to build and scale these capabilities independently. Respondents cite insufficient in-house AI knowledge and technology environments that cannot yet support AI initiatives as significant barriers. Industrial organizations cannot simply self-build their way into AI adoption. Instead, they require platforms that embed advanced analytics, automation and AI within familiar engineering workflows, reducing dependence on scarce AI experts while accelerating time-to-value.

- **Look beyond general-purpose analytics.**

Leaders should prioritize platforms purpose-built for industrial complexity, where data are fragmented, decisions carry real operational and financial consequences, and the cost of acting on incomplete insight is high. Adoption barriers underline why this matters. As well as budget and ROI constraints, 76% cite poor-quality or incomplete data, alongside insufficient in-house knowledge, as challenges (see **Figure 11**). Rather than asking organizations to choose between standardized software and proprietary expertise, such platforms enable firms to combine their own engineering knowledge, workflows and IP with AI-driven analytical capabilities.

Figure 12

Cross-functional collaboration

For which departments is working collaboratively with other departments especially important?



Note: Data labels are rounded to zero decimal places.
Source: Verdantix Industrial AI Analytics Survey 2026

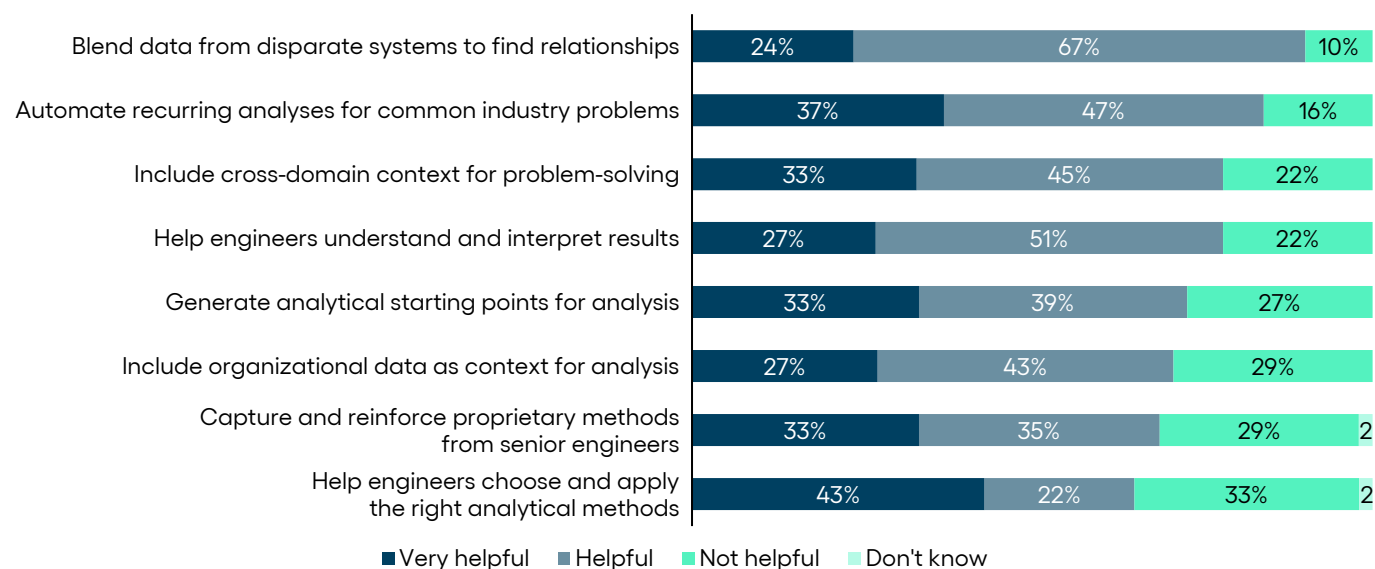
N=51



Figure 13

Industrial AI analytics for organizational problem-solving

In what ways would industrial AI analytics most help your organization with problem-solving?



Note: Data labels are rounded to zero decimal places; percentages less than 5% are written as numbers.

Source: Verdantix Industrial AI Analytics Survey 2026

N=51



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