OCTAVE

400 executives & senior leaders

1 key topic – digitalization

Business performance and compliance in the pharma sector

Top pharma manufacturing executives share insights into the data technologies behind their drive for competitive advantage



75%

of pharma organizations have increased the number of digital tools and data sources they utilize over the past 12 months

Data: The key to performance and compliance

Leaders are driving transformation through sharper data capabilities

We surveyed

400

global C-suite executives and senior leaders across pharma, food and beverage, power, oil and gas and chemicals to understand the data capabilities shaping their competitive edge.

Pharma manufacturers are pushing hard to modernize. The scale is huge. The stakes are higher. And performance, compliance and continuous improvement all hinge on one thing. Clear, connected, fast-moving data. Real transformation doesn't happen without it.

Teams need rapid, contextualized visibility across operations, projects and assets. When the right people get the right intelligence at the right moment, decisions get sharper. And outcomes follow.

For pharma organizations, connected data is a force multiplier. It removes friction from critical processes. It streamlines workflows. It improves resource utilization. It strengthens supply chain responsiveness. And it unlocks true end-to-end integration, from production through delivery. The impact is immediate: stronger financial performance, faster innovation and accelerated progress toward sustainability goals.

Connected intelligence also elevates compliance. With clearer visibility, manufacturers can adapt to shifting regulations, reduce risk exposure and build the operational resilience demanded in a constantly evolving landscape.

Data dilemmas

Pharma organizations run on complex, mission-critical systems. But that complexity comes with a cost. Disconnected platforms and inconsistent processes trap data in silos, slow decision-making, inflate operational expense and open the door to scalability issues, cybersecurity exposure, safety risks and other disruptions that erode performance and compliance.

Forward-thinking leaders are pushing for a different future. One built on connected intelligence and real-time visibility. They want tools that cut through fragmentation and deliver a competitive edge. Yet many still struggle to integrate the technologies that could remove these barriers.

To understand why, we surveyed global C-suite executives and senior leaders from large industrial organizations. Including major pharma manufacturers. Their insights reveal the most pressing challenges they face and how they're approaching data technologies to overcome them.

Our goal is simple: give you clear, practical intelligence and best practice recommendations that strengthen performance, support compliance and help your organization move with confidence.

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Today's top challenges in the pharma sector



Leaders from industrial businesses across APAC, Europe, Latin America, the Middle East and North America contributed to this report. Each representing organizations with over $1 billion in revenue and more than 1,000 employees.

Pharma executives were unequivocal. Several high-impact challenges are holding their organizations back, limiting performance, complicating compliance and slowing the continuous operational improvement the sector depends on.

Cost pressures

Cost pressure is hitting pharma hard. For example: 73% of sector leaders report a strong or severe impact from missed project milestones.

73%

of sector leaders report a strong or severe impact from missed project milestones.

64%

of sector leaders say unplanned production downtime is hitting operations at the same intensity.

63%

of sector leaders report a strong or severe impact from projects running over budget.

64% say unplanned production downtime is hitting operations at the same intensity. And 63% report a strong or severe impact from projects running over budget.

These pressures land at a time when pharma organizations are already battling inflation, trade tariffs and rising operational costs. All direct hits to revenue and competitiveness.

The challenge deepens when assets can't scale. 70% of pharma leaders say the inability to scale industrial assets to meet demand is having a strong or severe impact, signaling significant issues with technical availability and throughput.

Cost pressure isn't a single issue, it's a chain reaction. And without sharper visibility and stronger data connectivity, that chain only gets harder to break.

Compliance concerns

Regulatory pressure in pharma is intensifying. And the operational impact is clear. 67% of pharma executives say safety concerns are having a strong or severe detrimental effect on their operations. 64% report cybersecurity risks at the same level.

These findings won't surprise pharma leaders. What is revealing are the forces behind them. Systems that don't talk to each other, data that doesn't move fast enough and workflows that can't keep pace with regulatory expectations. This is the day-to-day reality for manufacturers striving to deliver on their strategic, compliance, and performance goals. Without the connected intelligence needed to stay ahead.

63%

of pharma executives acknowledge a strong or severe impact from projects running over budget.

67%

of the industry's executives say safety concerns are having a severe or strong detrimental impact on their business.

The factors behind the challenges



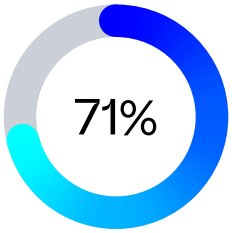
A major force behind these challenges is talent. 80% of pharma leaders say skills and knowledge gaps are having a strong or severe impact. 77% say retirements and departures are hitting operations at the same level. Capability is shrinking just as expectations rise.

Data issues compound the pressure. Pharma executives report severe or strong impacts from:

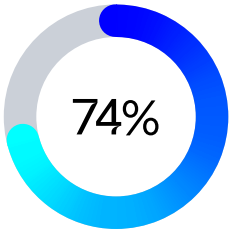
74%

say delayed or out-of-date information is having a strong or severe detrimental impact.

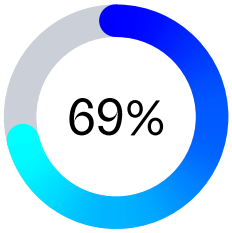
Poor data integration and/or connectivity



Delayed or out-of-date information



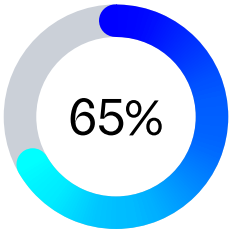
Incomplete or inaccurate information



These gaps aren't accidental. They're the result of outdated systems and methodologies still in play across the sector. 76% of pharma executives say manual processes are having a strong or severe impact on their challenges. 75% say the same about aging infrastructure and legacy systems.

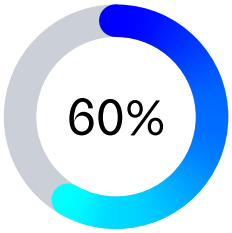
Other contributors include:

Lack of stakeholder alignment



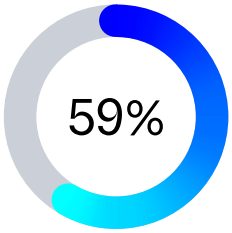
signaling leadership and coordination issues

Asset unreliability



indicating weak risk assessment and mitigation

Increased maintenance costs



pointing to over- or under-maintenance

In a sector under pressure to deliver flawless performance while controlling costs, these issues create real drag. They slow decisions, increase exposure and undermine resilience.

As we'll see next, data visualization tools can help close these gaps. But only when adopted and connected in the right way.

76%

of pharma executives say manual processes have a strong or severe impact on their business challenges.

71%

say poor data integration/ connectivity has a strong or severe impact.

Data visualization: The most adopted solutions

Sophisticated digital tools are on the rise, helping pharma organizations counter mounting operational and compliance challenges

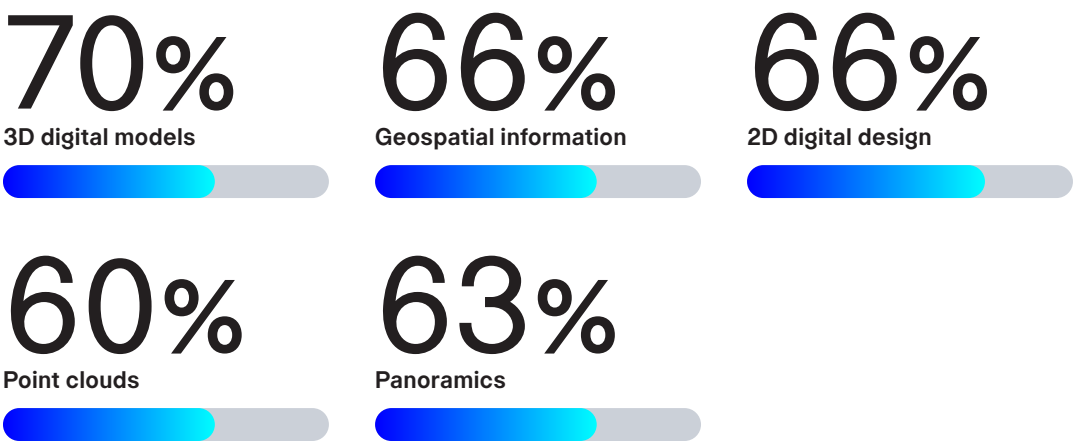


Pharma manufacturers are responding to escalating pressures by increasing their investment in digital technologies. 75% of pharma leaders agree: 'My business has increased the number of digital tools and data sources over the past 12 months'.

Tools that sharpen visibility into assets and processes are being adopted at scale. Visualization dashboards lead all technologies, used frequently or continuously by 78% of pharma manufacturers.

Adoption of advanced tools is accelerating as well. Digital twins are now widely used across the industry, with momentum growing fast. In Hexagon's Digital Twin Industry Report, 80% of leaders say AI has increased their interest in digital twin technology. Knowledge graphs and info maps also see heavy use, frequently or continuously deployed by 67% of pharma respondents.

Digital thread technology has become a major component of the sector's digital stack, used to a high degree by 73% of pharma manufacturers. But adoption quality varies. And so do outcomes. A significant share of organizations still rely on fragmented, manual methods. 62% continue to use paper-based information frequently or continuously. Other point solutions remain heavily used:



This mix of modern systems, legacy tools, and manual processes signals a clear gap. Pharma organizations still have significant headroom to improve data connectivity and real-time visibility. Closing this gap is essential for strengthening performance, ensuring confident compliance, and driving continuous operational improvement at scale.

"My business has increased the number of digital tools and data sources over the past 12 months."

75% **of pharma leaders surveyed agree with this statement**

The investment/ value gap

Data access, connectivity and continuity must be preserved for digital thread technology to work effectively



"The lack of available data on asset performance is impacting the financial performance of the business."

66% **of pharma leaders surveyed agree with this statement**

The pharma sector has rapidly expanded its use of advanced data visualization tools. Adoption is high and rising. But set against the disruptive challenges organizations continue to report, the question emerges. Why aren't these digital investments delivering more impact?

55% of the pharma leaders surveyed agree with the statement 'transformation efforts in our organization haven't yet returned the expected value'.

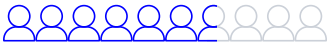
55%



of pharma leaders surveyed agree with the statement 'transformation efforts in our organization haven't yet returned the expected value'.

The reasons go deeper than the tools themselves:

66%



say "the lack of available data on asset performance is impacting the financial performance of the business."

58%



say "the tools and platforms used to visualize data lack connectivity to each other."

It should be noted that, in this context, Octave defines "asset performance" as the safe and predictable operation of assets at an optimal cost, avoiding the failure risks that can impact business objectives.

And the challenge isn't unique to pharma. Across sectors, adding more tools is often creating more work, not less.

Among organizations that increased their toolset in the past year:

63%

say their teams spend too much time manually creating reports and consolidating data—an average of 18.72 hrs/wk or 117 days/yr lost to manual effort.

75%

report missed project milestones, compared with 57% among those who didn't add tools.

67%

say projects are running over budget, compared with 55% for those who kept their toolset stable.

Disconnected tools don't create intelligence. They create friction. Without strong data access, reliable connectivity and continuity across systems, even the most sophisticated digital technologies fail to deliver the unified visibility and performance gains the pharma sector needs.

Safety and cybersecurity compliance implications

Increasing the number of digital tools is also amplifying safety and cybersecurity risks across the pharma sector. Directly affecting organizations' ability to maintain confident regulatory compliance.

The numbers are clear. Among organizations that added more tools in the past 12 months:

70%

cite safety concerns as a challenge, compared with 49% of those that didn't expand their toolset.

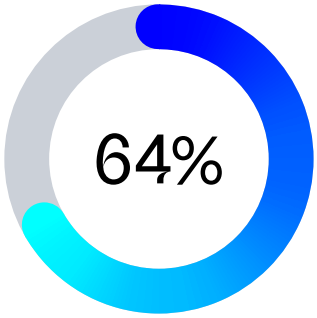


66%

report cybersecurity concerns, versus 53% among those who haven't added additional tools.



The impact extends beyond technical risk. Expanding toolsets also appears to strain alignment across teams:



64% of organizations that increased their number of tools report stakeholder-alignment challenges, compared with 56% of those that kept their toolset stable.

More tools don't guarantee more capability.

Without best-practice strategies to connect and govern them, organizations introduce new risks. Exactly what digital transformation is supposed to eliminate.

To unlock the value these tools promise, pharma manufacturers need a connected, disciplined approach that ensures data flows cleanly, systems reinforce each other and technology strengthens compliance. Not complicates it.

Solution in focus: The digital thread

The technology can provide end-to-end visibility for pharma organizations that follow best-practice implementation





Our research reveals the same themes across the pharma sector: an urgent need for sharper data visibility, persistent difficulty connecting tools, heavy manual effort to generate insights. And ultimately, digital investments that are not returning the value leaders expect.

That's why the focus now turns to digital thread technology. When implemented with discipline, the digital thread creates a continuous, end-to-end flow of data across operations, assets and digital platforms. It has the potential to resolve the very issues holding organizations back. Fragmented intelligence, disconnected systems and slow, labor-intensive decision-making.

Adoption is growing. 69% of executives globally report continuous or frequent use of digital thread technology. Among them, 71% say stakeholders have direct access to the data and systems they need. Compared with 57% among organizations using the technology less frequently.

But a notable minority still report that stakeholders don't have the access they need. Which raises the critical question:

If the digital thread promises a true "single pane of glass" for all operational and asset data, why isn't it delivering that outcome for everyone?

As we'll explore next, the answer lies in digital thread maturity. The difference between merely implementing the technology and deploying it in a structured, best-practice way that unlocks its full value.

IDC's three stages of digital thread maturity

In the 2025 IDC analyst brief, 'Unlocking industrial transformation with a unified digital thread from engineering to operations,[1]' IDC, in conjunction with Octave, observes that there are three stages of digital thread maturity, based on the solutions selected and methodology followed:

Low maturity

"Labor-intensive, ad hoc integrations of data and manual data transfers of external data are conducted. Often, this external data fails to be utilized, especially in the case of engineering and construction data. The electronic product code process creates value-rich documentation and data that provides a baseline ontology of an entire operational setting. However, at the handoff, this data set is often recreated nearly entirely from scratch by the owner operator."

Moderate maturity

"Some isolated data integration capabilities are executed with the help of IT staff by utilizing horizontal tools and practices. This works for some data and use cases, but often neglects the operations subject matter expertise necessary to contextualize data fully. Many organizations report years-long efforts to pipe operational data from many sources to an IT data lake only to find that combining the data in meaningful ways is severely limited because it lacks context and is not available in a timely manner."

Robust maturity

"Organizations develop a digital thread through a platform-based architecture that maintains data context within original applications while ensuring data access and continuity through engineering to operations and beyond. These organizations understand that data context is best preserved closest to the source and is ever changing."

[1] Unlocking Industrial Transformation with a Unified Digital Thread from Engineering to Operations, 2025 IDC Analyst Brief, sponsored by Octave, document no. US52853924, January 2025

Asset management systems strategy:

The key to maximizing business value from technology





Marc Laplante
Senior industry consultant, Octave

Marc Laplante, senior industry consultant at Octave, explains why a focused asset management systems strategy is essential for public-sector organizations looking to accelerate the value of their data-visualization investments.

What is asset management systems strategy?

It's a strategic discipline that defines how an organization manages its assets across their entire lifecycle. Acquisition, operations, maintenance and eventual disposal. At its core, it ensures asset objectives align directly with organizational objectives.

In other words: know what you have. Understand what it's worth. Manage it with purpose.

Why should manufacturers focus on this before thinking about technology?

Manufacturers need to start with asset-management strategy before thinking about technology because many of their hardest problems aren't rooted in tools. They're rooted in performance.

One global manufacturer we work with uncovered 40% capacity underutilization, driven directly by weak asset-management practices. They can sell everything they make. Recovering that lost capacity isn't incremental. It's transformational.

Another major organization discovered that several smaller assets, while individually insignificant, were collectively dragging down performance and running far above budget. Strengthening their asset-management system would immediately reduce cost of goods sold.

In both cases, the breakthrough came from stepping back and reassessing the entire asset-management approach. What does better performance look like? Where will the gains show up? How will it shift cost, capacity, reliability and throughput?

Strategy sets the direction. Technology only delivers value once that direction is clear.

Where does a best practice asset management systems strategy begin?

It starts with clarity at the highest level. You begin by reviewing the organization's core goals. What are the priority targets? What pressures – budget, regulatory, operational – shape them?

Then you narrow the lens. Which operational inefficiencies are slowing progress today? Which assets sit at the center of those processes? What's the current approach to asset management strategy? How do you assess asset risk and what methodologies guide that assessment?

It's a disciplined progression: from objectives to pressures, to inefficiencies, to critical assets, to risk frameworks. That structure becomes the foundation for every decision that follows.



Marc Laplante
Senior industry consultant, Octave

With regard to those critical assets, how can pharma organizations best assess current performance and then optimize it?

Start by assessing the current asset management system against the ISO 55001 standard. This review highlights gaps across the entire asset management framework. From policy and planning to performance evaluation and how nonconformities are reported.

The outcome is clear and actionable. At minimum, a strategic asset management plan that maps the next steps and establishes a path toward maturity. Many organizations discover they're further along than expected. And that they now have the structure to optimize performance with confidence.

As an organization begins to implement a refreshed asset management systems strategy, how can it ensure sustained success?

Sustained success depends on people and culture. Executive leadership must be fully aligned. Active in removing obstacles that slow teams down. Their role is to empower employees, nurture autonomy and create an environment where people can focus on what they do best.

When leaders model that commitment, everyone moves with clarity. Teams can see their progress. Feel the impact of the strategy. And stay engaged.

We haven't talked about technology – such as data visualization tools – at all to this point. Where does this come into the strategy?

This is intentional. Technology comes later. On purpose.

There's a useful parallel here. We've never had more data about how we eat, sleep or exercise, yet poor health remains widespread in places like the US and Canada. Data alone doesn't change outcomes. The foundation does.

Organizations are in the same position. They have more data visualization tools than ever. But as the research shows, many still aren't seeing the value they expected. Without a clear asset management systems strategy, the tools stay disconnected, underutilized and unable to solve the operational challenges they were meant to address.

A strong strategy is the equivalent of a healthy baseline. It sets the direction, establishes the discipline and ensures the organization knows what it needs to measure. And why.

From there, leaders can identify the right data visualization solutions to support that strategy, accelerate maturity and enable the organization to operate at its best in pursuit of its objectives.

Survey methodology

How we built our global survey

This report draws on data from Octave's global study into the impact of digital tools and data across industrial environments. We surveyed 400 decisionmakers, including C-level executives, to understand their biggest operational challenges and how digital tools are shaping performance across their organizations.

Our respondents represented major industrial markets worldwide:

APAC: Australia, Hong Kong, Japan, Singapore, South Korea

Europe: France, Germany, Italy, Spain, the UK

Latin America: Brazil, Chile, Mexico

Middle East: Israel, Qatar, Saudi Arabia, UAE

North America: Canada, the US

We focused on three core sectors: manufacturing, oil & gas / chemicals and power. Every organization surveyed operates at enterprise scale, with more than $1 billion in annual revenue.

Fieldwork was conducted by phone and online between December 2024 and January 2025. Respondents were required to be either top level decision makers or report directly to them. Ensuring every data point reflects leadership priorities and on the ground realities.

Questions focused on both the digital tools they are using and the business value they are seeing.

To see how Octave can accelerate your organization's digital thread journey. And to explore real examples from businesses already making the shift. Visit our online hub.

Taking the next step

For pharma leaders balancing performance, patient safety and tightening regulatory scrutiny, visibility is critical.

The next step isn't adding more digital tools. It's connecting the data behind them. So teams have a trusted, real time view across manufacturing, quality and compliance.

Octave helps pharma organizations unify operational intelligence, reduce manual reporting and strengthen compliance without slowing innovation or production.

Connect with Octave to turn data complexity into confident, compliant performance.

Contact us

About Octave

Octave is a leader in enterprise software, turning data into decisive action and intelligence into your edge. Our software solves for and simplifies complexity, from the design and build to operations and protection of people, property, and assets– for any scope, at any scale. For decades, we've partnered with customers to sharpen performance, elevate efficiency, and amplify results. From factory floors to entire cities, our solutions are tuned to scale up what's possible from day one onward.

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