OCTAVE

400 executives & senior leaders

1 key topic – digitalization

Business and compliance

in the food and beverage sector

Top food and beverage manufacturing executives share insights into the data technologies behind their drive for competitive advantage

77%

of food and beverage manufacturers have increased the number of digital tools and data sources they utilize over the past 12 months

Data: The key to performance and compliance

We spoke to

400

global C-suite executives and senior leaders across the manufacturing (pharmaceuticals and food & beverage), power, oil and gas and chemicals industries.

Leaders are driving transformation through enhanced data capabilities

Across the world, large and complex food and beverage manufacturers are using digital transformation to sharpen performance, strengthen compliance and drive continuous improvement. All to operate smarter, move faster and stay ahead of tightening regulatory expectations.

Real transformation depends on one thing. Rapid, contextualized data visibility across operations, projects and assets. The right people getting the right intelligence at the right moment. Shifting decision-making from reactive to decisive.

For food and beverage organizations, this level of connected data unlocks real operational momentum. It removes friction, optimizes workflows, improves resource utilization and enables fully integrated performance from production through delivery. The result? Measurable financial gains. Amplified innovation. Accelerated progress toward sustainability targets.

It also strengthens compliance at the foundation. With connected intelligence, manufacturers can adapt to evolving regulations, streamline risk management and build a more resilient, future-ready operation. One capable of meeting rising expectations in a fast-changing world.

Data dilemmas

Food and beverage manufacturers run on complex systems. Production lines, quality processes, supply chains, compliance workflows, asset networks. But that complexity comes with a cost. Disconnected systems trap data in silos, slow decision-making and drive up risks: rising operational costs, scalability bottlenecks, cybersecurity exposure, safety issues and other disruptions that hit performance and reliability.

Forward-thinking leaders are pushing for a different model. One built on connected intelligence and real visibility across their operations. They're looking for technologies that cut through fragmentation and give them a competitive edge. But many still struggle to integrate the tools needed to get there. The promise is clear; the execution is harder.

For this report, we surveyed global C-suite executives and senior leaders from large industrial organizations, including major food and beverage manufacturers, to understand their biggest challenges and their experiences adopting data technologies to overcome them. Their insights reveal what's working, what's not and where the next wave of transformation needs to focus.

Contents

Today's top challenges in the food and beverage sector

73%

of food and beverage executives acknowledge a strong or severe impact from projects running over budget

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

Executives in the food and beverage manufacturing sector were clear: a set of persistent, high-impact challenges is holding their organizations back. These challenges are constraining performance, complicating compliance and slowing the continuous improvement required to stay competitive in a fast-moving, highly regulated environment.

Cost pressures

73% of leaders from the food and beverage manufacturing sector report a strong or severe impact from projects running over budget. 70% say missed project milestones are having a strong or severe operational impact. And 67% acknowledge the same level of disruption from unplanned production downtime.

These hits land at a time when the sector is already navigating rising inflation, trade tariffs and escalating operational costs. Factors that directly undermine revenue. The challenge deepens when assets can't scale fast enough to meet demand. 67% of food and beverage leaders say this inability to scale is having a strong or severe impact, pointing to technical availability issues and throughput constraints across many operations.

Cost pressure isn't a single issue. It's a cascade. And without sharper visibility and more connected data, that cascade becomes increasingly difficult to control.
Compliance concerns

Regulatory expectations in food and beverage manufacturing are rising fast. And the operational impact is unmistakable. 72% of industry executives say safety concerns are having a strong or severe detrimental effect on their operations. At the same time, 66% report cybersecurity risks at the same intensity.

These pressures don't exist in isolation. They reflect the day-to-day reality facing food and beverage organizations as they work to maintain compliance, protect consumers and uphold trust. All while pushing toward ambitious performance and efficiency goals. The challenges echo across the sector, but the underlying causes shed light on a deeper truth. Without connected data, sharper visibility and stronger digital capabilities, even well-resourced organizations struggle to keep pace with evolving regulatory demands.

72%

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

The factors behind the challenges

74%

of food and beverage executives say manual processes are having a strong or severe impact with regard to their business challenges

72%

of food and beverage executives say poor data integration/ connectivity is having a strong or severe impact with regard to their challenges

67%

of food and beverage leaders say that the inability to scale industrial assets to meet demand is having a strong impact on business

A critical driver behind these challenges is the availability of experienced talent. 75% of food and beverage leaders worldwide say employees retiring or leaving the organization are having a strong or severe impact. 74% report skills and knowledge gaps affecting their ability to meet operational and strategic demands. Capability gaps are widening just as expectations rise.

Data quality and data availability compound the issue. Leaders report severe or strong impacts from:

Incomplete or inaccurate information

Delayed or out-of-date information

Poor data integration/connectivity

Outdated methodologies and aging systems sit at the center of these problems. 79% of food and beverage executives cite aging infrastructure and legacy systems as having a strong or severe impact. 74% say manual processes are causing the same level of disruption.

Other major contributing factors include:

Increased maintenance costs

indicating over- or under-maintenance

Asset unreliability

highlighting challenges around risk assessment and mitigation

Lack of stakeholder alignment

pointing to leadership and governance gaps

In a sector where organizations must deliver optimal performance while controlling costs, these factors can quickly erode resilience and competitiveness. They cannot be ignored. As we'll see next, data-visualization tools are already helping organizations make progress. But adoption challenges still stand in the way of unlocking their full value.

Data visualization: the most adopted

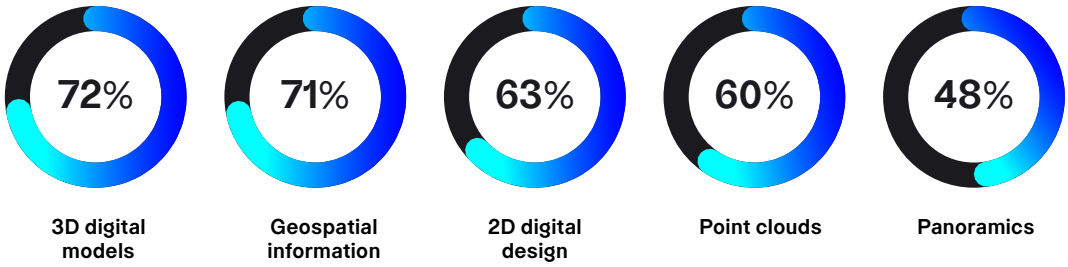
Sophisticated digital tools are on the rise. Counteracting the pressures facing food and beverage manufacturers.

Food and beverage organizations are responding to mounting operational and compliance challenges with increased technology investment. 77% of sector 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 seeing the highest uptake. Visualization dashboards lead the way, used frequently or continuously by 79% of food and beverage manufacturers.

The momentum extends across a broader set of technologies. Digital twins are gaining global traction and interest is accelerating. According to Hexagon's Digital Twin Industry Report,[1] 80% of leaders say AI has increased their focus on digital twin technology. Knowledge graphs and info maps also see strong adoption, used frequently or continuously by 73% of respondents.

Digital thread technology has reached significant usage as well, with 65% of food and beverage manufacturers deploying it to connect data across their operations.
But adoption isn't consistent. And that inconsistency matters. 63% of organizations still rely on paper-based information frequently or continuously. Several point solutions remain heavily used, including:



This mix of modern tools, legacy systems and manual processes highlights a clear gap. Many organizations are still far from achieving seamless data connectivity.
The takeaway is direct:

There is significant headroom for food and beverage manufacturers to enhance data visibility and integration. Closing these gaps will be essential to strengthening performance. Meeting compliance demands. And driving continuous operational improvement at scale.

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

77% **of food and beverage sector leaders agree with this statement**

[1] Hexagon Digital Twin Report, 2025, Hexagon

The investment/ value gap

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

The food and beverage sector has quickly expanded its use of sophisticated data-visualization tools. Adoption is high and investment continues to climb. But when measured against the disruptive challenges organizations are still facing, one question stands out. Why aren't these digital investments delivering more impact?

The disconnect is clear in the data. 62% of food and beverage leaders agree with the statement: "Transformation efforts in our organization haven't yet returned the expected value."

The underlying reasons cut straight to data quality and system fragmentation:

- 69% agree that "the lack of available data on asset performance is impacting the financial performance of the business."
- 62% agree that "the tools and platforms used to visualize data lack connectivity to each other."

Within this context, Octave defines asset performance as the safe and predictable operation of assets at optimal cost, avoiding failure risks that threaten business objectives.

The pattern becomes even more striking at a global level. Across sectors, increasing the number of digital tools often creates more work, not less. Among organizations that added tools over the past year:

- 63% say their team spends too much time manually creating reports and consolidating data. An average of 18.72 hours per week or 117 working days per year.
- 75% report missed project milestones causing a detrimental impact, compared with 57% among organizations that did not add more tools.
- 67% say projects are running over budget, compared with 55% of those who haven't added tools.

117

working days a year

are lost to manual effort

Tools alone don't solve the problem. Without connected data, consistent access and continuity across systems, digital thread technology cannot deliver the unified, real-time intelligence it promises. And without that foundation, digital transformation will continue falling short of expectations.

"Transformation efforts in our organization haven't yet returned the expected value."

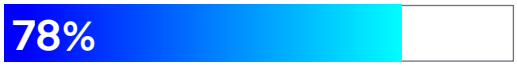
62% **of food and beverage manufacturing leaders agree with this statement**

Safety and cybersecurity compliance

Increasing the number of digital tools is also amplifying safety and cybersecurity risks across the food and beverage sector. Risks that directly affect an organization's ability to maintain confident regulatory compliance.

Among organizations that added more tools over the past 12 months:

Cite safety concerns as a challenge



Did not expand their toolset

Report cybersecurity concerns

The impact doesn't stop there. Adding more tools also appears to strain stakeholder alignment. 64% of organizations that expanded their toolset report alignment challenges, compared with 56% among those that didn't.

More tools don't guarantee more control.

Without a best-practice strategy to integrate, connect and govern these technologies, organizations introduce new risks. Exactly the opposite of what digital transformation is meant to deliver.

To unlock real value, data tools must work together as part of a connected, intentional ecosystem. That's what turns complexity into clarity. Ensuring digital investments strengthen compliance rather than compromise it.

Danone addresses key operational challenges through data visibility

The challenges

Bilal Alani, group head of IT and data and CIO for R&D at global food leader Danone, explained to our researchers why the organization, operating hundreds of factories worldwide, faces persistent data-integration challenges and manufacturing projects that run over budget. "The landscape in manufacturing is very segmented for many reasons – partly, for example, because of acquisitions of factories.

Another reason is the unique specificities of different factories and their production lines around the world. For that reason, factories can define the strategy they want to implement for digitalization. But that means standardization of a system across the factories can become very difficult."

Regarding the impact of different legacy systems across the factory landscape, Alani adds: "Across different factories, legacy systems can have different processes and different data models. From a global view, this means there are gaps in the reconciliation of data for dashboarding to make decisions. We can bridge that gap, there are many ways to do it, but it is not always a consistent process."

Key technology considerations

When introducing new digital tools to address key challenges, Alani says it's vital to have a strategy to mitigate risk: "Cybersecurity is very complex as each factory has a lot of digital components and tools, but we control this through compliance – defining standards in cybersecurity that each factory must comply with."

The business also takes a pragmatic approach to how new technology tools are greenlit by the organization. Allowing flexibility but within certain parameters:

"For example, if a factory wants to change their MES [manufacturing execution system] because the moment is right and the value is right, then they can do it on-demand, but only by using the approved core system – rather than another vendor or solution.

"For other aspects, such as demand planning, this is a top-down decision, a control tower – this is not something for which the factory can decide which [system or tool] they want to use."

Digital thread imperative

Alani says mature organizations should have a digital thread for enhanced visibility of their smart manufacturing operations. But he understands the challenges other organizations may be facing. The digital backbone [the underpinning technology on which the digital thread relies], he says, can sometimes be "the foundation that the business doesn't always understand".

He adds: "The expectation from the business C-Level is to have real-time data when it's needed, but sometimes there isn't the realization that this needs the investment and people to maintain and govern it, to get to the data clean and harmonized and gain the new digital capabilities."

In the next chapter, we look more closely at digital threads and the best practices required to overcome the implementation challenges that Alani identifies.

"Cybersecurity is very complex as each factory has a lot of digital components and tools, but we control this through compliance - defining standards in cybersecurity that each factory must comply with."

Bilal Alani
Group head of IT, data and CIO for R&D, Danone

Solution in focus: The digital thread

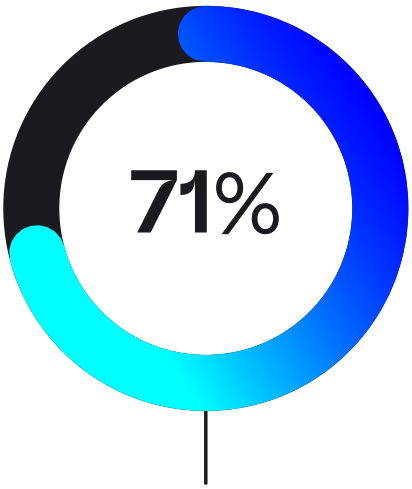
The technology can provide end-to-end visibility for food and beverage manufacturers that follow best-practice implementation.

Our research highlights a consistent pattern across the food and beverage sector. An urgent need for sharper data visibility, persistent difficulty connecting tools to one another and a growing burden of manual effort required to extract insights. The result is predictable. Digital investments that fall short of delivering the ROI leaders expect.

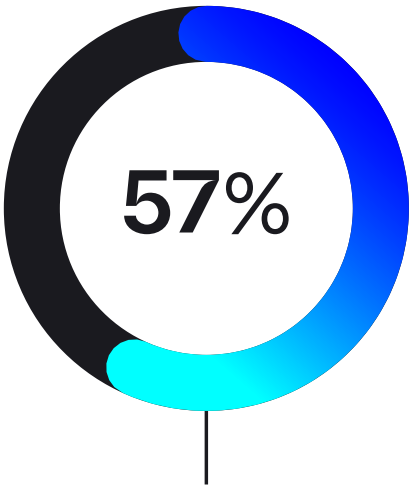
That's why the spotlight now turns to digital thread technology. When implemented effectively, the digital thread creates an end-to-end flow of data across operations, assets and digital tools. It has the potential to resolve the very challenges organizations are grappling with. Fragmented systems, disconnected intelligence and slow, resource-intensive decision-making.

Adoption is rising. 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 it less frequently.

But that still leaves a notable minority who report that stakeholders don't have direct access to the intelligence required to move quickly and confidently. The question becomes clear. 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 every organization?



stakeholders have direct access to the data and systems they need



organizations use digital thread technology less frequently

IDC's three stages of digital thread maturity

The 2025 IDC Analyst Brief, Unlocking Industrial Transformation with a Unified Digital Thread from Engineering to Operations[2], IDC, sponsored by 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."

[2] 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 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.

Marc Laplante
Senior industry consultant, Octave

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?

Because many of the sector's biggest challenges start with asset performance. Not technology.

One global food and beverage manufacturer we work with uncovered 40% capacity underutilization tied directly to asset-management shortcomings. They can sell everything they make. Recovering that lost capacity is pure growth.

Another major business found multiple smaller assets consistently underperforming and driving costs 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 re-examining the asset-management system itself. What does better performance look like? Where do the gains appear? How does it shift cost, capacity, and reliability?

The strategy creates the blueprint. Only then should technology enter the conversation.

Where does a best practice asset management systems strategy begin?

It starts at the top. You begin by reviewing the organization's highest-level goals. What are the priority targets? What external and internal pressures shape them? Regulatory requirements, market conditions, financial constraints?

Then you narrow the focus. Which operational inefficiencies are slowing progress today? Which assets sit at the center of those processes?

From there, the lens tightens again. What is our current approach to asset-management strategy? How do we assess asset risk and what methodologies guide that assessment?

It's a structured progression. From goals, to pressures, to inefficiencies, to critical assets, to risk frameworks.

That discipline is what turns asset management from a reactive function into a strategic engine.

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

Food and beverage organizations can start by assessing their asset-management system against the ISO 55001 standard. This review exposes gaps across the entire framework. From policy and planning to performance evaluation and how non-conformities are reported.

The outcome is practical and actionable. At minimum, a strategic asset management plan that defines the next steps and clarifies the path toward higher maturity. Many organizations discover they're closer to that next stage than expected. Once the right structure and visibility are in place.

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

Sustained success hinges on people and culture. Executive leadership must actively clear obstacles, empower teams and create an environment where employees can focus on what they do best.

When people are supported and autonomy is strengthened, alignment follows. And as the strategy begins delivering measurable impact on the bottom line, teams can see their progress. Building momentum and reinforcing the shift toward a more disciplined, high-performance asset-management approach.

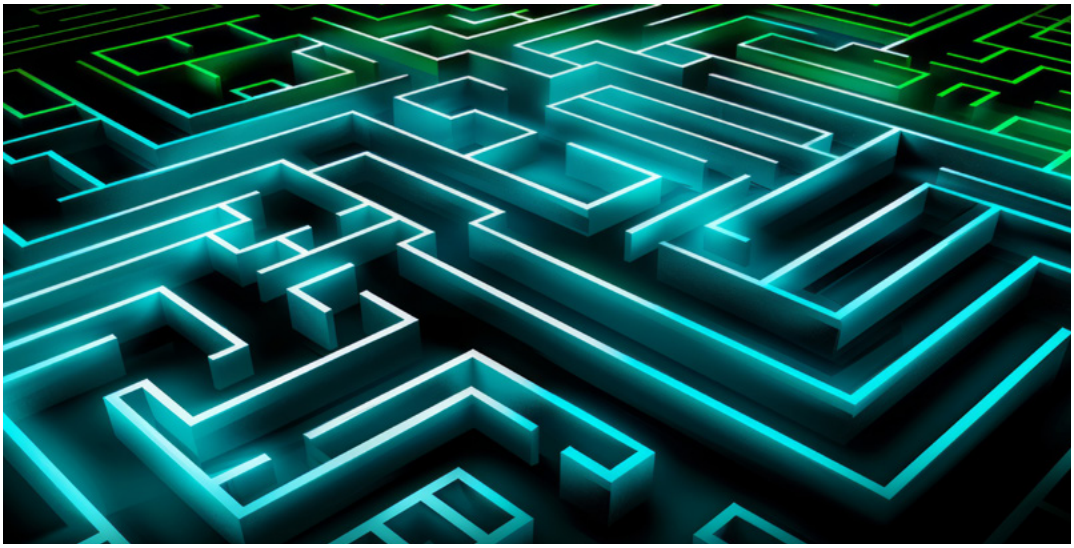
We haven't talked about technology - such as data visualization tools - at all to this point. Where does this come into the strategy?

This is intentional. Technology comes later. For a reason.

There's a useful analogy here: we have more data about how we eat, sleep and exercise than at any point in history. Yet poor health remains widespread in places like the US and Canada. Data alone doesn't drive improvement. The foundation does.

Organizations face the same reality. They have more data-visualization tools than ever. Yet, as the research shows, many still aren't seeing the value they expected. Without a clear asset-management systems strategy, tools remain disconnected, underused and unable to solve the business challenges they were meant to address.

A strong strategy is the equivalent of a healthy baseline. It gives the business structure, clarity and direction. Only then can leaders pinpoint the right data-visualization tools. The ones that reinforce the strategy, accelerate maturity and help the organization operate at its best in pursuit of its objectives.



Survey methodology

How we put our global survey together

This report draws on data from Octave's global study into the impact of digital tools and data across industrial environments. We surveyed 400 decision-makers, 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.

Taking the next step

For food and beverage manufacturers, performance and compliance depend on visibility. Leaders need a clear, trusted view across production, quality, assets and operations.

The next step isn't more tools. It's connected data that reduces manual effort, supports faster decisions and strengthens operational control.

Octave helps food and beverage organizations turn fragmented information into actionable intelligence. Supporting safe, compliant and high performance operations.

Connect with Octave to strengthen the data foundation behind operational excellence.

Contact us

About us

Octave provides mission-critical software that empowers organizations to make informed decisions across every stage of the asset lifecycle — Design, Build, Operate and Protect — where performance, safety and reliability are non-negotiable and failure is not an option.

Turning complex operational data into actionable intelligence, Octave connects expertise, real-world conditions and enterprise-scale insight to improve performance, resilience and incident response where it matters most.

Octave has approximately 7,200 employees in 45 countries.

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.