Different Industries, Same Problem: Why Companies Still Don't Know What's Happening in Their Operations

By Pierpaolo Pergola | March 24, 2026 | Operational Intelligence

Why operations teams across industries still struggle to understand the live state of their environment, and why operational intelligence infrastructure is becoming the missing layer.

1. A Pattern That Becomes Impossible to Ignore

After spending enough time working around operations teams, across different companies and contexts, a recurring pattern starts to emerge that is difficult to unsee once you notice it. The companies may vary in size, sophistication, and industry, but the underlying dynamic tends to be remarkably similar: systems are in place, data is being generated continuously, dashboards exist, and reporting processes are well established, yet when the conversation shifts from reviewing performance to understanding the current state of the operation, clarity quickly fades and answers become fragmented, delayed, or dependent on manual interpretation.

In practice, understanding what is happening at a given moment often requires pulling information from multiple systems, reconciling inconsistencies, and reconstructing a view that does not exist natively anywhere in the organization. Over time, this stops looking like a gap in execution or tooling and begins to resemble a structural limitation in how operations are represented and understood.

2. Different Contexts, Identical Dynamics

This limitation is not confined to a specific industry or operational model. It appears in environments that, on the surface, have very little in common with one another.

- Aircraft move continuously across jurisdictions with different regulatory and risk profiles.

- Cargo flows through complex networks of ports and inland corridors.

- Pharmaceutical products are transported through tightly controlled temperature conditions.

- Energy assets operate under fluctuating environmental and demand variables.

Despite these differences, the nature of the underlying systems is consistent. Each of these environments is dynamic, meaning that the state of the operation is constantly evolving as assets move, conditions change, and external factors influence performance. Understanding the operation, therefore, is not a matter of reviewing static information, but of following continuous change. The challenge is that most organizations are not equipped with systems that reflect that continuity.

Image: Illustration connecting aviation, maritime, pharmaceutical, and energy operations through the same underlying flow

3. The Limits of Systems Built for Processes

The root of the issue lies in how most operational systems were originally designed. Their primary function is to manage processes by recording transactions, enforcing workflows, and maintaining structured data that supports control, compliance, and reporting. They are highly effective at documenting what has been completed, registered, or approved, and they provide a reliable historical record of activity.

What they do not do particularly well is capture how an operation evolves in real time. The architecture of these systems is based on discrete events rather than continuous flows, which means that changes in the operational environment are only reflected once they have been processed and recorded. The result is a representation of reality that is inherently step-based, while the operation itself evolves without interruption. This mismatch creates a persistent gap between what is actually happening and what the systems are able to show.

Image: Continuous operational flow moving above a stepped, process-based system

4. How Fragmentation Becomes Structural

This gap is reinforced by the way technology environments typically grow over time. Rather than being designed as unified systems from the outset, most operational stacks are assembled incrementally, with new tools introduced to address specific needs as they arise. A system is implemented to manage assets, another to coordinate workflows, another to support compliance, and another to handle reporting or analytics.

Each of these components performs its intended function effectively, but they are rarely designed to operate as part of a cohesive whole. Data is stored in different formats, definitions vary across systems, and connections between them are often partial or improvised. As complexity increases, the effort required to understand how these systems relate to one another grows accordingly.

In this environment, operational visibility becomes something that is constructed outside the systems themselves. Teams rely on exports, spreadsheets, and internal reporting processes to bridge the gaps, effectively turning people into the integration layer. The organization, as a result, depends on manual interpretation to achieve a level of understanding that its systems cannot provide directly.

Image: Illustration of a fragmented operational stack built from disconnected systems

5. The Distance Between Reporting and Reality

The reliance on reporting further amplifies this limitation. Reporting systems are designed to summarize past activity in a structured and accessible way, which is essential for performance evaluation, financial oversight, and strategic planning. They provide a clear and consistent view of what has already taken place, often with a high degree of precision.

However, this clarity comes at the cost of immediacy. Reports are inherently retrospective, meaning they describe a version of the operation that has already stabilized into data. They do not capture the fluidity of the present moment, where conditions may still be shifting and outcomes are not yet determined.

For operations teams, this creates a disconnect between the information available and the decisions that need to be made. While reports offer a reliable account of the past, they provide limited support in understanding how the current state is evolving, where issues are emerging, or how different parts of the operation are interacting in real time.

6. The Ineffectiveness of Adding More Tools

Faced with limited visibility, organizations often respond by introducing additional tools, under the assumption that more data and more interfaces will lead to better understanding. New dashboards are implemented, analytics platforms are expanded, and reporting capabilities are enhanced in an attempt to close the gap.

In practice, this approach tends to increase the volume of available information without addressing the underlying structural issue. Each new system contributes its own dataset and perspective, but without a coherent layer that connects them, the overall picture remains fragmented. The complexity of the environment grows, while the effort required to interpret it increases.

The problem, therefore, is not a shortage of tools or data, but the absence of a unifying structure that allows these elements to function as part of a single operational view.

7. The Role of Operational Intelligence Infrastructure

Addressing this limitation requires a different approach, one that focuses on infrastructure rather than individual applications. What is needed is a layer capable of connecting systems, integrating operational signals, and continuously updating the state of the operation as new information becomes available.

This layer can be understood as operational intelligence infrastructure. Its function is to sit between existing systems and create a consistent representation of how the operation behaves over time. It brings together internal data, external inputs, and contextual information, and processes them in a way that reflects the continuous nature of operational change.

By doing so, it shifts the organization from relying on periodic snapshots to maintaining a live understanding of its environment. The emphasis moves from recording events to observing how those events interact and evolve.

Image: Operational intelligence infrastructure diagram showing fragmented systems below a unified layer and simplified outputs above

8. Early Signs Across Industries

Elements of this approach are already emerging in various industries, often under different names and implementations. In port operations, digital twin models combine infrastructure data, vessel movements, and operational signals to provide a real-time view of activity and capacity. In manufacturing, monitoring systems detect deviations in production as they occur, allowing for immediate intervention rather than post-process analysis. In energy, sensor data is used to track asset performance continuously and anticipate maintenance needs before failures occur.

In each of these cases, the value does not come from a single system or dataset, but from the integration of multiple sources into a coherent and continuously updated representation of the operation. The underlying principle remains the same regardless of context.

9. Why the Gap Persists

Despite the availability of data and the increasing awareness of its potential, most organizations have not implemented this type of infrastructure. The reasons are largely architectural and organizational rather than conceptual.

Integrating heterogeneous systems, managing continuous data flows, and maintaining a consistent operational state require specialized engineering capabilities that are not always present internally. At the same time, development resources are typically allocated to areas that are more directly linked to revenue or customer experience, leaving operational infrastructure under-prioritized.

As a result, organizations continue to expand their systems without fundamentally addressing how those systems work together, and the gap between operational complexity and operational visibility remains.

10. From Fragmented Insight to Continuous Understanding

When this gap is addressed, the impact extends beyond incremental improvements in efficiency or reporting. The organization's relationship with its operations changes in a more fundamental way.

Visibility becomes continuous rather than periodic, allowing teams to understand how conditions evolve as they happen. Decision-making shifts from reacting to completed events to managing ongoing processes. Coordination improves because systems no longer operate in isolation, and the need for manual reconciliation is significantly reduced.

In this context, the objective is not to replace existing systems, but to enable them to function as part of a unified operational environment.

11. The Next Phase of Operational Systems

For many years, digital transformation has been associated with the adoption of new systems and the digitization of processes. This phase has delivered significant benefits, but it has also led to increasingly complex and fragmented technology environments.

The next phase is less about adding new components and more about connecting what already exists. It requires a shift in focus from individual systems to the relationships between them, and from static representations of data to dynamic representations of operations.

Across industries, the same underlying condition persists: operations evolve continuously, while the systems used to manage them do not fully reflect that continuity. Closing this gap is not a matter of incremental improvement, but of introducing a new layer of infrastructure capable of aligning systems with the reality they are meant to represent.