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FEATURE ARTICLE · 2026



MANUFACTURING INTELLIGENCE

Why Easy Data Interpretation Matters: Democratizing Manufacturing Intelligence

An exploration of why manufacturing analytics platforms fail when they require data science expertise to operate, and how to build a data culture that empowers every person on the floor.

INSIDE The expertise tax / Same data, four questions / Five principles / Building a data culture

THE PROBLEM

The dashboard nobody opens

Manufacturers have never had more data. The question is why so little of it reaches the people who run the floor.

Picture a familiar plant. The connectivity project went live last year. Every critical machine streams data to the cloud, and the analytics platform can slice performance by line, shift, part and product family. The executive review deck has never looked better. Walk the floor at the start of second shift, though, and the picture changes. The supervisor runs the huddle from a whiteboard. The operator on Line 4 learns about a quality drift when the inspector walks over. The maintenance technician checks a paper log.

Nothing is wrong with the data. The problem is that reading it takes skills most people on the floor were never hired for. Answers live behind filters, query builders, statistical charts and tag names that only the integrator understands. When the only people who can interpret the data sit in an office, the data stops at the office.

Intelligence that stays in the office

This pattern has a cost that rarely shows up in a business case. Every question from the floor becomes a request to an analyst or engineer. The request joins a queue. By the time the answer comes back, the shift that asked has gone home and the conditions that caused the problem have changed.

Over time, people stop asking. The platform becomes a reporting tool for management rather than a working tool for production, and the plant returns to the instincts and spreadsheets it was trying to replace.

Democratizing manufacturing intelligence means reversing that flow. It means putting interpretation, not just data, in the hands of the person closest to the problem, in a form they can read in seconds and act on before the shift ends.

FIG. 1 **Six signs your data stops at the office**

- ☐ Shift huddles run from a whiteboard, not a screen
- ☐ Operators hear about problems from inspectors, not the system
- ☐ Requests for "a quick report" queue up for analysts
- ☐ Each meeting starts by debating whose numbers are right
- ☐ Dashboards are opened mostly before management reviews
- ☐ Logins to the analytics platform cluster in a few offices

Two or more? Your plant is paying the expertise tax described on the next page.

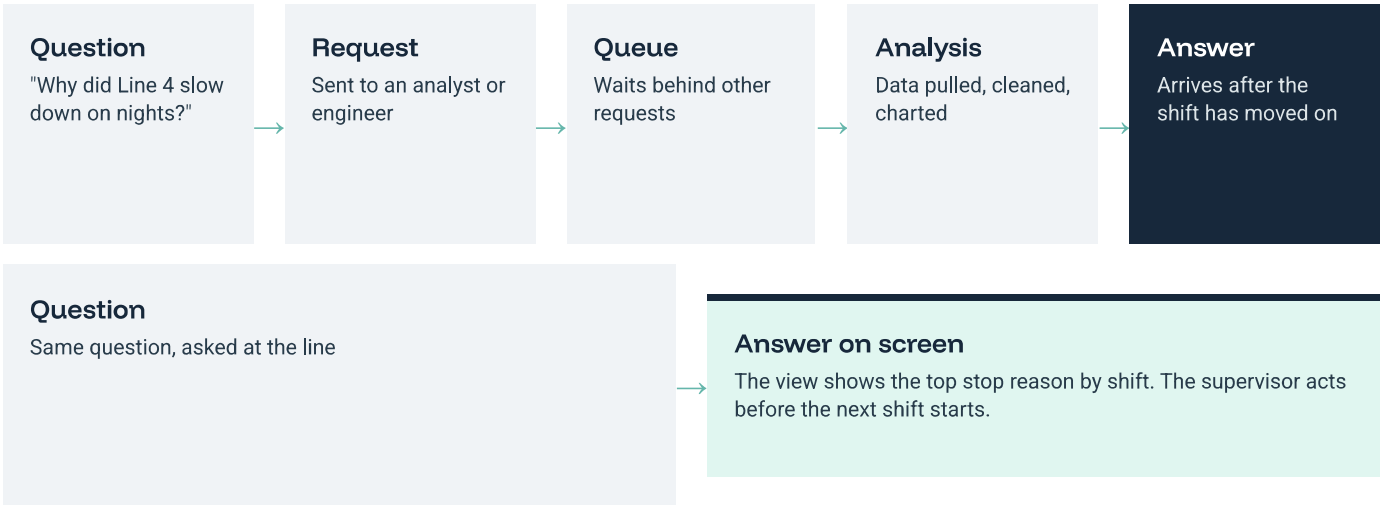
When the only people who can read the data sit in an office, the data stops at the office.

WHY PLATFORMS FAIL

The expertise tax

When interpretation requires a specialist, every question pays a toll in time.

FIG. 2 **The question queue**



1 Built for analysts, sold to plants

Interfaces assume the user knows how to build a query, choose a chart type and interpret a distribution.

2 Raw tags instead of plain words

Data arrives as controller addresses and codes. Without names and context, a number on screen has no meaning.

3 Too much at once

Every metric is shown with equal weight. The one exception that needs action is buried among hundreds of normal values.

4 Insight without a next step

A chart shows a problem but offers no way to assign, escalate or record a response, so nothing changes.

FIG. 3 **When the answer arrives too late to matter**

THE QUESTION	ASKED BY	USEFUL FOR	VIA THE QUEUE, ARRIVES
Why did Line 4 slow down tonight?	Supervisor	This shift	**After the shift has ended**
Is this bearing running hot?	Maintenance technician	Hours	**After the bearing has failed**
Which product family loses the most time?	Plant manager	This week	**After the review meeting**

Illustrative examples.

> None of these failures is about data quality or computing power. Each is a failure of interpretation: the gap between what the system knows and what a person on the floor can understand quickly enough to act.

DESIGNING FOR PEOPLE

Same data, four different questions

Easy interpretation starts with knowing who is asking. Each role needs a different view of the same source of truth.

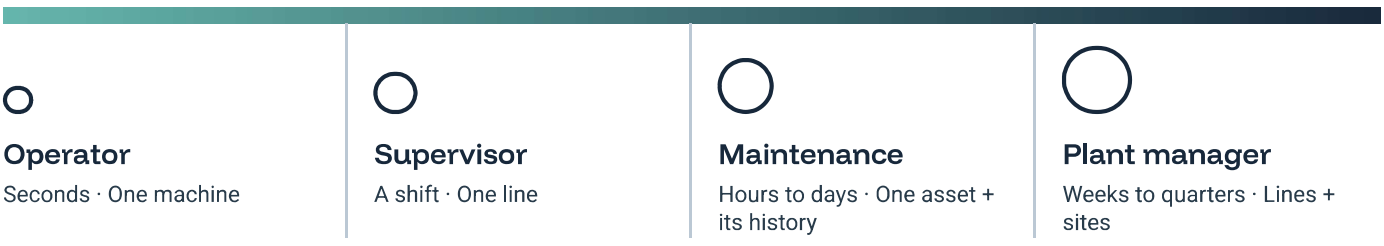
FIG. 4 **Who asks what, and what they need to see**

01 Operator	02 Supervisor	03 Maintenance technician	04 Plant manager
THEIR QUESTION **"Is my machine running well right now?"**	THEIR QUESTION **"Where is my shift losing time?"**	THEIR QUESTION **"Which asset needs me first?"**	THEIR QUESTION **"Are we improving, and where should we invest?"**
TIME HORIZON Seconds to minutes	TIME HORIZON The current shift	TIME HORIZON Hours to days	TIME HORIZON Weeks to quarters
THE RIGHT VIEW A large status tile: running, idle or down, with the current reason and the next target.	THE RIGHT VIEW Top losses by line, ranked, with owners and open actions.	THE RIGHT VIEW Alerts by priority, with machine history and the condition that triggered them.	THE RIGHT VIEW OEE trends by line and site, with the biggest loss categories over time.

A common mistake is to build one dashboard and give it to everyone. The plant manager gets too much detail and the operator gets too little focus. A better approach starts from the decision each role makes and works backwards to the smallest amount of information that supports it.

The data underneath should be the same for every role. What changes is the level of detail, the time horizon and the language. That is what keeps the operator and the plant manager talking about the same numbers, even when they look at different screens.

FIG. 5 **Zoom level by role: same data, different distance**



WHAT EASY LOOKS LIKE

The same moment, shown two ways

Both screens below describe one event on one line. Only one of them can be understood from across the aisle.

FIG. 6 **Raw data versus interpreted data**

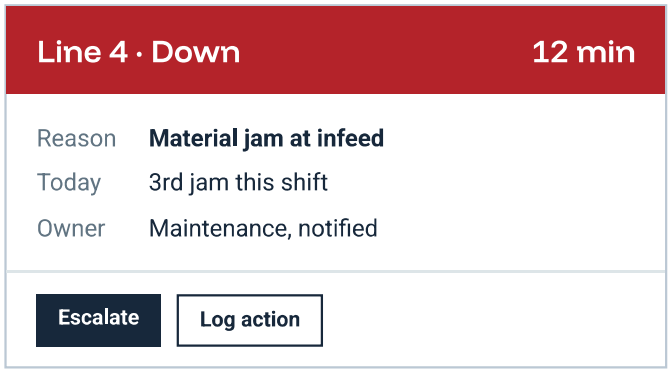
HARD TO READ

TAG	VAL1	VAL2	AN	FLT
N7:12	1	0	214.6	0x3F
N7:13	0	1	198.2	0x00
B3:0/4	1	1	—	0x1A
T4:2.ACC	—	—	4,812	—
N7:21	1	0	211.9	0x3F
F8:4	—	—	0.0347	—

Filter ▾ · Group by ▾ · Export CSV

Controller tags, codes and unlabeled values. Accurate, complete and almost useless to anyone who did not program the machine.

EASY TO READ



State, duration, reason, pattern and owner, in plain language, with the next action one tap away.

Illustrative screens.

The difference is not the data. Both views draw on the same signals. The difference is the work done before the data reaches the screen: naming the asset, translating codes into reasons, comparing against the shift so far, and attaching an owner.

That work used to happen in an analyst's head, one request at a time. An interpretable platform does it automatically, every time, for everyone.

FIG. 7 **From machine code to plain language**

WHAT THE MACHINE SAYS		WHAT PEOPLE NEED TO READ
`N7:12 = 0`	→	**Line 4 stopped**
`FLT 0x1A`	→	**Material jam at infeed**
`T4:2.ACC = 4,812`	→	**4,812 parts this shift**
`AN 214.6`	→	**Spindle temperature 214.6 °F, normal**
`OEE_A 0.71`	→	**Availability 71%, below the 80% target**

Illustrative tags and values.

A DESIGN STANDARD

Five principles of easy interpretation

Use these as a test for any screen, report or alert before it reaches the floor.

1

Speak the language of the floor

Use machine names, reason codes in plain words and units people already use. If a term needs a glossary, it needs renaming.

ASK

Would a new operator understand this label?

2

Attach context automatically

Show every value with its machine, part, work order and shift. A number without context invites a debate instead of a decision.

ASK

Can I tell which order and shift this is from?

3

Lead with exceptions

Highlight what is abnormal and keep normal operation quiet. People should see the one problem before the hundred healthy readings.

ASK

Is the problem visible in under five seconds?

4

One number, one meaning

Define OEE, downtime and scrap once, and use the same definitions on every screen and in every meeting.

ASK

Does this match the number in the morning meeting?

5

Put the action beside the insight

Every alert or chart that reveals a problem should offer the next step: assign, escalate, record, verify.

ASK

What can I do from here?

FIG. 8 **The five-second test**

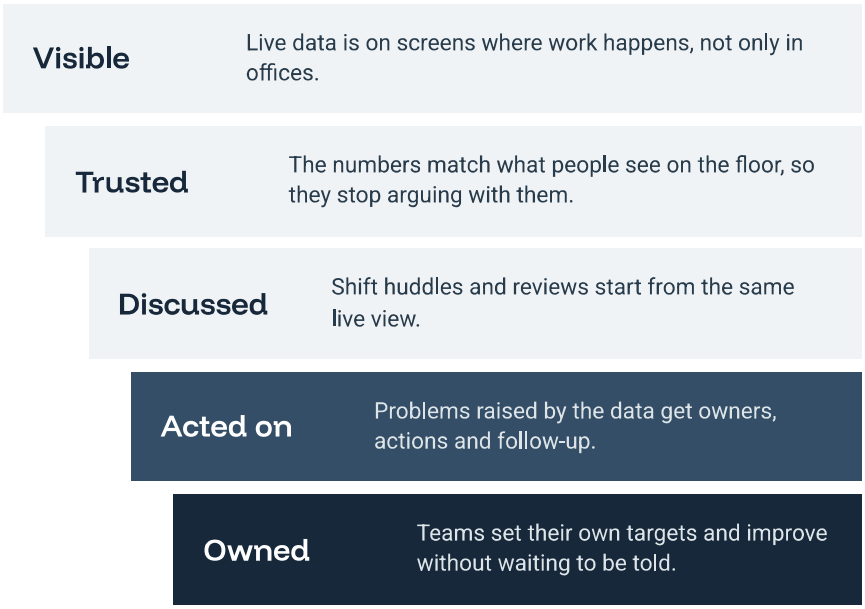
1. **Show** — Put the screen in front of someone who did not design it.
2. **Wait 5 seconds** — Then take it away.
3. **Ask** — "What is wrong, and who needs to act?"
4. **Decide** — If they cannot answer, simplify the screen and test again.

BUILDING A DATA CULTURE

Tools enable it. Habits make it stick.

A data culture is not a dashboard rollout. It is a set of daily habits that make data part of how the plant runs.

FIG. 9 **Five stages of a floor-level data culture**



THREE HABITS TO START

Start the huddle on screen
Open every shift meeting with the live view of yesterday's top losses.

Close every alert
No alert is finished until someone records what was done.

Celebrate the fix
Share the before and after when a team solves a loss.

Each stage depends on the one before it. People will not discuss numbers they do not trust, and they will not trust numbers they cannot see or understand. That is why easy interpretation comes first: it is the entry point to every later stage.

Leaders set the pace. When a plant manager asks "what does the screen say?" before "what do you think happened?", the habit spreads quickly. When leaders bypass the data, so does everyone else.

FIG. 10 **A 10-minute shift huddle, run from the data**

0–2 min	2–5 min	5–8 min	8–10 min
Yesterday on screen Top three losses from the live view	**Open actions** Who owns what, and what is overdue	**Today's risks** Alerts, changeovers and staffing gaps	**Commitments** One owner and one deadline per action

People will not discuss numbers they do not trust, and they will not trust numbers they cannot understand.

INTELYCX CORE

Intelligence designed to be read

Intelycx CORE was built so that the people closest to production can understand and act on machine data without a data scientist in the loop.

Preconfigured, not programmed

Throughput, downtime and OEE visibility without complex configuration or custom development.

Views for every role

Performance by work order, part, machine, line or shift, with configurable dashboards across facilities.

The right alert to the right person

Real-time alerts and notifications, with P911 for urgent interventions.

Analytics that explain

Descriptive, diagnostic and predictive analytics show what happened, why, and what is likely next.

Action built in

Integrated workflows and automated audit tracking turn each insight into an assigned, recorded action.

One source of truth

A unified namespace normalizes machine data, so every role sees the same numbers.

FIG. 11 **One platform, a view for every role**

	OPERATOR	SUPERVISOR	MAINTENANCE	PLANT MANAGER
Live machine status	●	●	●	○
Alerts + notifications	●	●	●	○
P911 interventions	●	●	●	○
Shift OEE + top losses	○	●	○	●
Machine health + history	○	○	●	○
Trends by line + site	○	●	○	●
Audit trail of actions	○	●	●	●

● Primary use. Every role draws on the same unified data.

CASE IN POINT · MEDICAL DEVICE MANUFACTURER

From siloed SCADA data to a shared view

An automated new-product line had recurring faults, quality rejects and initial OEE of 30–40%. Existing SCADA information was siloed and required substantial analysis before it could guide a response. Combining faults, inspection data, sensor telemetry and production KPIs in one place gave engineering a view it could act on, and live data helped validate each change.

UPTIME

Low 40s → **>80%**

SCRAP RATE

>30% → **<1%**

Reported within a few months. Results included targeted engineering changes.

WHAT TO DO NEXT

Six questions to ask any analytics platform

- [ ] Can an operator understand the main screen without training?
- [ ] Does every value carry its machine, part, order and shift?
- [ ] Does every alert have an owner, an action and a record?
- [ ] Are OEE, downtime and scrap preconfigured, or built per project?
- [ ] Can a supervisor answer "where did we lose time?" in under a minute?
- [ ] Will every role see the same numbers from the same source?

FIG. 12 **Score the platform: count your "yes" answers**

0–2	3–4	5–6
Expertise tax	**Partly open**	**Built for the floor**
Interpretation depends on specialists. Expect low adoption on the floor.	Some roles are served. Close the gaps before scaling to more lines.	Data can be read and acted on by every role.

CONCLUSION

Manufacturing analytics fails quietly. The platform runs, the data flows and the dashboards exist, but the people who could use them most do not. The cause is almost never the technology underneath. It is the distance between what the system knows and what a person can understand in the moment it matters.

Closing that distance is a design choice and a leadership choice. Choose tools that speak the language of the floor, lead with exceptions and put the next action beside the insight. Then build the habits that make reading the data part of every shift. When interpretation is easy, intelligence stops being a specialist skill and becomes the way the whole plant works.

See what your floor could read tomorrow.

Book a walkthrough of Intelycx CORE with your own production data.

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