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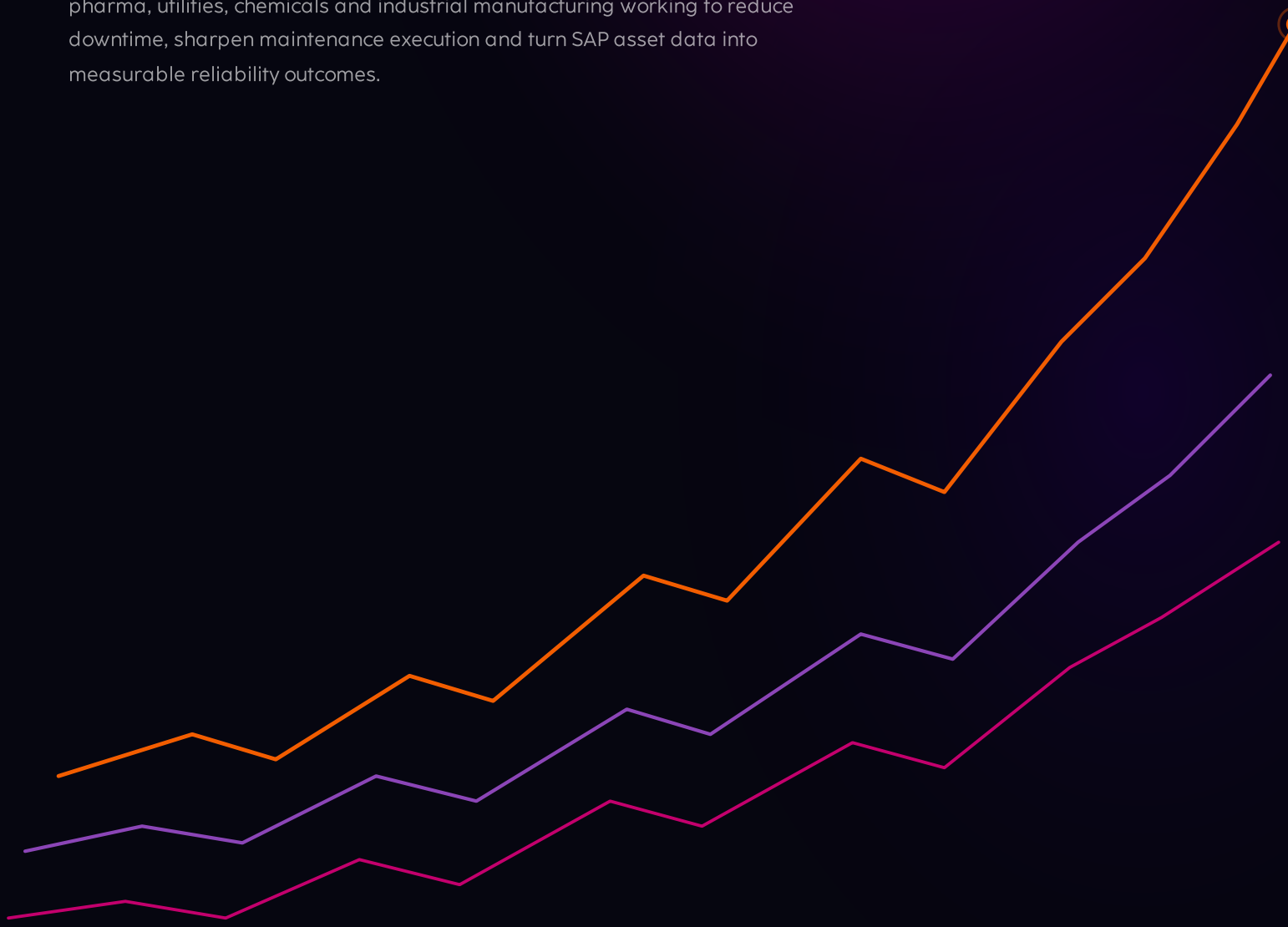
WHITE PAPER

ASSET RELIABILITY · ASSET-INTENSIVE MANUFACTURING

Why CMMS Projects Rarely Deliver the Reliability Gains Manufacturers Expect

The 7 Gaps Between Asset Data and Reliability Performance

A practical guide for asset-intensive manufacturers in food and beverage, pharma, utilities, chemicals and industrial manufacturing working to reduce downtime, sharpen maintenance execution and turn SAP asset data into measurable reliability outcomes.



AN INDX POINT OF VIEW
INDUSTRIAL TRANSFORMATION, EXECUTED END-TO-END

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You bought the system. The reliability never showed up.

Imagine walking a manufacturing facility that has every reason to run well. The maintenance system is live, a capable CMMS, often SAP Plant Maintenance and sometimes already on the roadmap toward SAP Asset Performance Management. The license is paid. The modules are configured. And yet the same problems that justified the purchase are still standing there, quiet and stubborn, as if the software never arrived at all.

Unplanned downtime still consumes the schedule. Maintenance quality shifts depending on who works the evening. Whether the facility produces beverages, pharmaceuticals, chemicals or industrial equipment, the pattern shows up with striking consistency. Asset data is thin or contradictory, nobody trusts the reports enough to act on them, and when leadership asks how the network is performing, the honest answer is a shrug because no two plants are counting the same things the same way.

The natural reflex is to blame the tool. Re-implement it, re-platform it, find the module with the better demo. That reflex is expensive and it is almost always wrong. Research on large-scale change programs tells a consistent story: roughly seven in ten transformations fall short of their original objectives, and the deciding factor is rarely the technology.[2] What separates the ones that succeed is whether the organization actually changed how it works. **Tools don't create reliability. Disciplines do.**

It helps to see where SAP fits in all of this, because the platform is a genuine enabler when the foundation is ready for it. SAP Plant Maintenance and Enterprise Asset Management form the operational foundation, the system of record for asset data, maintenance planning and work management. SAP Field Service and Asset Management extends that foundation into scheduling, dispatch and mobile execution. SAP Asset Performance Management sits at the top of the curve, where reliability engineering, risk scoring, asset health monitoring and predictive maintenance live. Each step unlocks more capability, and each one delivers in proportion to the people, processes, data and governance underneath it.

> **A CMMS records what already happened. Reliability is about changing what happens next. The distance between those two things is what this paper is about.**
>
> THE GAP IS OPERATIONAL, NOT TECHNICAL

That is why the most useful first move is rarely a new module. It is an honest assessment of five things: people, processes, technology, data and SAP readiness. Before expanding into additional SAP capabilities, an organization that understands where those five stand can sequence its investment instead of guessing at it. What follows are the seven gaps that assessment looks for, and the paper returns to the assessment itself at the end.

Technology doesn't create reliability. It reveals the discipline that already exists.

INDX · ASSET MANAGEMENT PRACTICE

The 7 gaps between asset data and reliability performance

Reliability is a chain. Each gap is a break point, downstream of the last. Close them in order and the gains follow. Skip any one and the chain is only as strong as its weakest link.

The same progression maps onto the SAP journey. Plant Maintenance and EAM establish the foundation, Field Service and Asset Management sharpen execution, and Asset Performance Management enables prediction. Each stage pays back only when the one before it is solid.

START HERE

Asset Master Data

Hierarchy, functional locations, criticality. The foundation everything else depends on.

FOUNDATION

GAPS 1 & 3

Maintenance Planning

Standardized PM tasks, failure codes and scheduling disciplines across every site.

STANDARDIZE

GAPS 2, 4 & 5

Execution

Technicians complete planned work on time. Operations and maintenance share ownership.

EXECUTE

GAP 6

Failure History

Consistent codes and root-cause data. The history predictive models must learn from.

LEARN

GAP 6 +

Analytics & APM

SAP APM and predictive maintenance, only as good as the data they receive.

PREDICT

GAP 7 → OUTCOME

Business Outcomes

Uptime, OEE, lower MTTR, asset longevity and ROA. Value leadership can report and fund.

RESULTS

Every gap below is a break point in this chain. Close them in order.

1 **Data quality gap**
Inherited registers with duplicate records and inconsistent naming.

2 **Adoption gap**
The floor reverts to spreadsheets. History evaporates.

3 **Standardization gap**
Every site treats assets differently. Accurate comparisons across sites become impossible.

4 **Planning vs execution gap**
A schedule exists. The day is run by whatever broke last night.

5 **Ops & maintenance gap**
How a line is run writes the failure history maintenance is handed to fix.

6 **Predictive readiness gap**
No clean history. No consistent codes. No data for a model to learn from.

7 **Business value gap**
Maintenance measured in work orders closed is invisible in a boardroom. Until it reports in downtime avoided, it is funded like a cost center.

The foundation gaps

01 The data quality gap

Picture the first week after a CMMS goes live. The implementation team migrates the existing asset register, built in a spreadsheet years ago and never fully cleaned up. Duplicate equipment numbers come across. Rotating assets land under a generic parent called "Line 3." Functional locations stop at the room rather than the machine. Within a quarter, technicians stop trusting the system because the work order describes an asset that doesn't match what they're standing in front of. **Every reliability metric built on that foundation inherits the noise.**

THE TELL Two people pull the same report and get two different numbers.

EXAMPLE: PROCESS MANUFACTURING

Two plants in the same network both run centrifugal pumps on similar lines but name them differently, one by manufacturer model and one by a legacy convention. When corporate asks for a fleet reliability report, the data cannot be consolidated. Every attempt to roll up performance metrics produces a number nobody trusts, and benchmarking across sites requires a translation project before the analysis can even begin. The problem was not the tool. It was the foundation beneath it.

02 The adoption gap

Think about what the first six months after go-live actually look like on the floor. Training happens in a single rushed afternoon. The system is live but the workarounds are still faster and still familiar. Within months, technicians are logging completed work from memory at the end of the shift rather than updating the system in real time. McKinsey finds the same pattern across every kind of transformation: the deciding variable is behavior change, not software.[2] **Adoption is not a configuration setting.** It comes down to whether the system makes a technician's day easier than the workaround did. If it does not, no mandate will hold that ground for long.

THE TELL Work orders close in batches at shift end, all marked "complete, no notes."

Standardization and planning

03 The standardization gap

Imagine a VP of reliability asking for a network-wide view of pump performance across eight facilities. What comes back is a spreadsheet full of footnotes explaining why the numbers cannot be compared directly. Each facility built its asset hierarchy differently, wrote its own failure codes and named its equipment in a way that made sense locally but translates poorly across the network. The underlying data exists. The shared language does not. **A common asset taxonomy, a shared failure-code library and consistent criticality definitions are the unglamorous prerequisite** for every cross-site insight the business will eventually ask for.

This is where a disciplined SAP rollout earns its keep. A global template defines the shared taxonomy, failure codes, criticality model, and a unified way of capturing maintenance costs consistently across every site to allow accurate comparisons, while a site-level fit-gap analysis captures where local reality genuinely differs. Controlled deviations are documented and governed rather than left to accumulate on their own. Standardize first and roll out in phases, and enterprise reporting, benchmarking and reliability finally become possible across sites that each arrived with their own SAP maturity and habits.

THE TELL Best practice at one site cannot be copied to another without a translation project first.

04 The planning vs. execution gap

Ask a maintenance manager how the week is going and you will often hear some version of the same answer: they were supposed to complete fourteen PMs but the conveyor went down on Monday morning and the week never recovered. The schedule that looked reasonable on Sunday night became irrelevant by noon on Monday. Planned work got pushed, then cannibalized for parts and people, then quietly closed without completion so the numbers would still look acceptable. A healthy operation runs the large majority of its labor as proactive planned work. A struggling one lives in permanent reaction mode, where every firefighting hour is an hour not spent preventing the next fire.

THE TELL The PM schedule is full but compliance is below 60% and the team is always behind.

The performance gaps

05 The operations and maintenance alignment gap

Here is a dynamic that plays out more often than most organizations want to admit. A line goes down and maintenance has one explanation for what happened. Operations has a different one. Each account is internally consistent and each team believes theirs is the accurate version. What neither version captures is the interplay between how the line was run and how the asset behaved. An ARC Advisory Group study of 365 practitioners found about two-thirds reported that reliability-centered maintenance programs were not actually improving reliability.[3] The reason is consistent across industries: **operations influences asset performance as much as the maintenance organization does.** When the two functions own reliability separately, each one ends up explaining the other's downtime rather than preventing it together.

THE TELL Maintenance and production each have a story for the downtime and they don't match.

EXAMPLE: BEVERAGE BOTTLING

A filler on a high-speed bottling line begins triggering intermittent fault alarms. The maintenance team replaces the proximity sensors. The alarms return within a week. They replace the sensors again, then a third time over two months, each time ruling out the hardware and suspecting a batch quality issue. A cross-functional review finally surfaces something nobody had thought to check: the operator startup sequence had been quietly modified on one shift to save a few minutes during changeover, creating micro-surges that tripped the sensor threshold. The fix took ten minutes and cost nothing. The three sensor replacements and the lost production cost the site thousands. The asset was fine. The gap was between what maintenance saw and what operations was doing.

06 The predictive readiness gap

At some point in almost every digital transformation, a slide appears in the boardroom deck showing a path to predictive maintenance. The timeline looks achievable and the ROI looks compelling. What the slide rarely shows is what needs to be true about the plant's data before any of those algorithms can do useful work. Predictive models need clean asset master data, a failure history coded consistently over years, honest criticality rankings and instrumentation that was deliberately planned. SAP Asset Performance Management is built for exactly this capability, monitoring asset health, scoring failure risk and combining IoT sensor data with maintenance history to sharpen decisions.[4] But the platform performs in proportion to the data it receives. **A plant that has not curated its history cannot ask a model to learn from it.**

THE TELL The predictive pilot stalls in "data preparation" and never reaches production.

The business value gap

07 The business value gap

Consider what happens when the plant reliability lead walks into the annual budget review. The slides show work orders completed, PM compliance percentages and wrench time ratios. The CFO looks at the numbers and asks a simple question: what did this actually save us? There is often no clean answer, because the program was never designed to produce one. ARC Advisory Group describes asset performance management as the discipline that ties uptime, repair time, asset life, quality, on-time delivery, safety and return on assets into a single chain.[3] **Until a reliability program reports in downtime avoided and OEE recovered** rather than tasks completed, it will be read as a cost center and funded accordingly. That is the surest path to recreating every gap described in this paper.

THE TELL The reliability team cannot answer "what did this save us?" in dollars.

IN SUMMARY / THE SEVEN GAPS

Key takeaways

Technology doesn't create reliability. Disciplines do.	**Data quality is the foundation.** Every metric inherits its noise.
Adoption matters more than implementation. Unused systems deliver nothing.	**Predictive maintenance needs disciplined execution.** No history, no model.
Operations and maintenance must share ownership. Separate accountability produces separate blame.	**Measure outcomes, not work orders.** Downtime avoided. OEE recovered. ROA improved.

The numbers behind the seven gaps

Every gap in this paper has a body of research behind it. The numbers below come from primary analyst and industry studies, and the patterns they describe show up consistently whether the plant makes food, pharmaceuticals, chemicals or industrial equipment.

30–50%	~2 in 3	20–40%
Downtime reduction when predictive maintenance is built on a reliable foundation[1]	Practitioners reporting that RCM programs are not improving reliability[3]	Increase in machine life from structured predictive maintenance programs[1]

THE DESTINATION

Predictive maintenance. Asset health scoring. AI-driven decisions. Achievable on the right foundation.

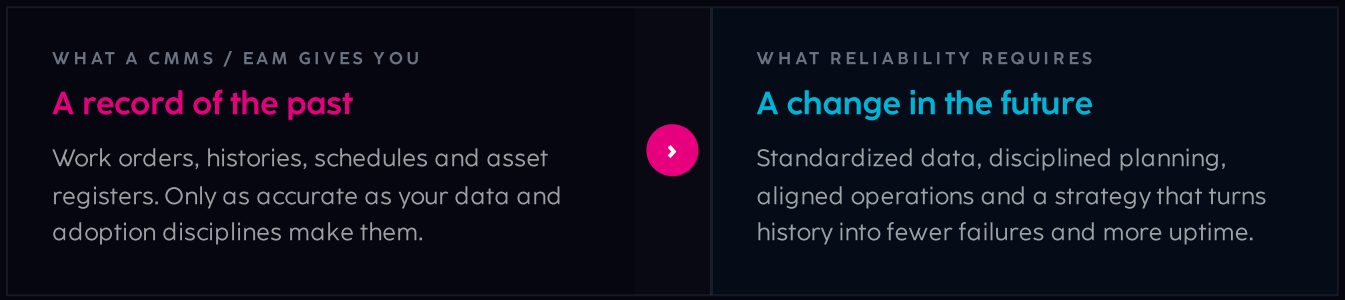
McKinsey's research puts a number on the upside: predictive maintenance can cut downtime by 30 to 50 percent and extend asset life by 20 to 40 percent.[1] Those results are real and achievable, but they come after the foundational work is done, not before. SAP gives the journey a clear arc, with Plant Maintenance and EAM for the foundation, Field Service and Asset Management for execution, and Asset Performance Management for prediction.[4,5] Each layer is powerful, and each delivers in proportion to the operational maturity beneath it. The platform is ready for the journey. The real question is whether the foundation is ready too.

It was rarely only the software.

There is a moment that happens in many of these projects. The system has been live for a year, sometimes two. The reliability numbers have not moved the way the business case promised. Someone suggests that the platform might be the problem and the conversation turns toward a re-implementation. Read the seven gaps side by side, though, and a different root becomes obvious. The software is rarely the culprit, and modern SAP platforms are genuinely capable. Each gap is a question of operating model, data discipline and reliability strategy, the layer that decides whether the platform can deliver what it promises.

A maintenance system is a recording instrument. It captures what happened to your assets with whatever fidelity your people and processes give it. Reliability is something different. It is the work of changing what happens next, and that work lives in disciplines the software cannot supply on its own. The platform records the past and makes prediction possible. The gaps are about what has to change before that record becomes something you can build on.

The more useful question is the one the gaps point to. Each one traces back to the same root: a system recording the past with insufficient discipline, and an organization expecting the platform to bridge a gap that only process and behavior can close. Close the gaps and the same SAP investment starts to pay back.



Before the next tool, assess the foundation.

Most organizations that go through a structured assessment discover something similar: two or three gaps they expected to find and at least one they didn't. The ones they didn't expect are usually the ones doing the most damage. An IndX Asset Reliability Assessment evaluates the five dimensions that determine whether any system, SAP APM included, will actually deliver the reliability gains it promises.

PEOPLE

Skills, ownership and whether the floor actually uses the system. Adoption and alignment across sites.

PROCESS

Planning and scheduling discipline. The ratio of planned to reactive work and what protects it.

TECHNOLOGY

How well the current CMMS or EAM fits the work, and the distance to where you need it to be.

DATA

Asset master quality, failure-code consistency, criticality ratings and cross-site standardization.

SAP READINESS

Whether your foundation can feed predictive maintenance and APM, or needs preparation first.

~$5M

Proof, not projection. In a recent assessment for a leading asset-intensive manufacturer, IndX identified approximately $5 million in potential savings over five years, before a single new module was purchased. Assessments like this routinely surface opportunities worth millions, the kind that stay hidden until someone measures the foundation directly.

Where does your foundation stand?

Before the next investment in software, tools or modules, it is worth understanding exactly where the foundation stands today. An Asset Reliability Assessment provides a structured evaluation of your people, processes, technology and data to surface the highest-impact opportunities first. In as little as three months you will have a prioritized roadmap and a business case you can defend in any boardroom.

START YOUR ASSESSMENT →

Research sources

Every statistic in this paper is drawn from primary industry and analyst research and paraphrased from the original source. No figure has been fabricated or extrapolated. While examples draw on food and beverage manufacturing, the research and gaps apply across asset-intensive industries including pharma, utilities, chemicals and industrial manufacturing. Sources are listed below for verification.

1 **McKinsey & Company.** *Manufacturing Analytics Unleashes Productivity and Profitability.* McKinsey & Company, 2017.
Source for the finding that predictive maintenance typically reduces machine downtime by 30 to 50 percent and increases machine life by 20 to 40 percent.
mckinsey.com/capabilities/operations/our-insights/manufacturing-analytics-unleashes-productivity-and-profitability

2 **McKinsey & Company.** *Why Do Most Transformations Fail? A Conversation with Harry Robinson.* McKinsey & Company, 2019.
Source for the finding that roughly 70 percent of large-scale transformations fall short of their objectives, and that success depends on changing behavior rather than deploying technology.
mckinsey.com/capabilities/transformation/our-insights/why-do-most-transformations-fail-a-conversation-with-harry-robinson

3 **ARC Advisory Group.** *Rethinking Asset Performance Management.* ARC Strategies Report, AspenTech, 2019.
Survey of 365 industry practitioners. Source for the finding that about two-thirds say reliability-centered maintenance is not improving reliability, that operations affects asset performance as much as maintenance, and for the APM value chain linking uptime, MTTR, asset life, quality, delivery, safety and ROA.
arcweb.com/blog/rethinking-asset-performance-management · aspentech.com/en/resources/report/arc-insights-report-rethinking-asset-performance-management

4 **SAP SE.** *SAP Asset Performance Management.* SAP Product Documentation, 2024.
Source for SAP APM framing: minimizing asset failure risk through asset health monitoring, IoT and sensor data, maintenance history and AI-assisted maintenance decisions, balancing performance, cost and risk.
sap.com/products/scm/apm.html

5 **SAP SE.** *SAP Asset Performance Management: Capabilities Overview.* SAP Learning & SAP Community, 2024.
Source for the APM capability set including asset health monitoring, risk management, predictive and prescriptive maintenance, RCM and FMEA within SAP APM.
learning.sap.com · community.sap.com