



Old Problems. New Tools.

Why isn't operational value
keeping pace with innovation

dss⁺

Protect. Transform. Sustain.

Investment in AI is moving at extraordinary speed. Gartner expects worldwide spending to reach \$2.6 trillion in 2026, up 47% in a year.¹ Yet the same forecast points to a more complicated picture: organisations continue to favour tactical applications that deliver incremental gains in efficiency and productivity, while CIOs struggle to demonstrate tangible business outcomes from their AI investments.

Evidence from manufacturing sharpens the tension. Research published by MIT in 2025, drawing on US Census Bureau data covering tens of thousands of manufacturing firms, found that productivity fell by 1.33 percentage points after companies adopted AI, even after controlling for factors including company size, age, capital and IT infrastructure. Over time, AI adopters went on to outperform non-adopters in productivity and market share. Those gains emerged alongside changes in processes, data infrastructure, workforce capabilities and ways of working.²

The gap between adoption and value is where the harder work begins. New capabilities have to change something in the operation: how a problem is understood, where attention is directed, how decisions are made or how work gets done. The graveyard of pilots familiar to many organisations is one consequence of failing to make that translation: technologies can demonstrate technical potential without delivering sustained operational value.

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In generative AI, for example, Gartner reported that at least half of projects had been abandoned after proof of concept by the end of 2025, citing poor data quality, inadequate risk controls, escalating costs and unclear business value.³

For industrial companies, that raises a more consequential question: what can these new capabilities contribute to the operational problems that have proved hardest to shift? AI is one part of an expanding set of tools that includes richer operational data, advanced analytics, external benchmarks and connected technologies.

Those problems are not difficult to find: serious injuries and fatalities, recurring reliability losses, throughput variability, energy and material losses, and productivity that becomes harder to improve without adding further processes, systems and complexity. These are familiar problems. What is different is the evidence, analytical capability and breadth of reference now available to understand them, and the possibility of identifying interventions that were previously difficult to see.

1. Gartner. "Gartner Forecasts Worldwide AI Spending to Grow 47% in 2026." Gartner, 19 May 2026.

2. Burnham, Kristin. "The 'Productivity Paradox' of AI Adoption in Manufacturing Firms." MIT Sloan, 9 July 2025.

3. Chandrasekaran, Arun. "Why 50% of GenAI Projects Fail — And How to Beat the Odds." Gartner, 26 January 2026. <https://www.gartner.com/en/articles/genai-project-failure>

A different view of the operation

Persistent operational problems can be highly visible. What is harder to see is the combination of factors and conditions shaping them, particularly when data, performance and accountability sit in different organisational silos. A serious incident may span operating conditions, control effectiveness, supervision and organisational decisions. A recurring reliability loss may cut across asset performance, maintenance practices and production pressures. Productivity losses may reflect process design, capability, behaviours and how work is organised.

New capabilities make it possible to examine these connections with greater depth and across a wider frame of reference. Data from different parts of the operation can be considered together, patterns tested across sites and over time, and internal experience compared with external benchmarks and operating environments. Advanced analytics can surface relationships that conventional analysis may miss, while operational expertise can determine which are consequential to the outcome.

This changes the basis for intervention. Leaders can challenge established explanations for why performance is stuck, identify where the greatest leverage lies and direct attention, expertise and investment accordingly.



Raising performance without adding complexity

Industrial organisations often respond to persistent performance problems by adding processes and capabilities: stronger controls, additional procedures, new systems, more assurance, more data, more training. Many of these interventions have delivered substantial gains. Their cumulative effect can also make operations harder to navigate, and increase complexity to a significant degree, particularly at the frontline.

AI, advanced analytics and connected technologies create new scope for more precise intervention. By interpreting more information, across more sources and closer to real time, they can help distinguish the conditions that warrant attention from those that do not. Combined with operational expertise, this allows attention and intervention to be concentrated where they can have the greatest effect.

Frontline teams routinely work within layers of information, controls and requirements accumulated over years of operational improvement. Greater AI-enabled intelligence can extract insights on a more selective basis rather than adding another layer of complexity. It can help determine which signals require attention, which interventions should take priority and where existing processes contribute little to the outcome. For leaders, the potential is greater performance from the capacity already inside the organisation, with attention, expertise and effort deployed more deliberately.

The same principle applies to risk. Better visibility can bring intervention closer to the point at which exposure changes, while external benchmarks and experience can challenge assumptions formed from an organisation's own history.

The strategic question is whether new capabilities can raise safety and performance while reducing the complexity required to achieve them.

Testing the ambition against serious risk

Serious injury and fatality prevention provides a demanding test. Decades of progress have strengthened standards, critical controls, risk assessment, investigations and leadership practices. Yet eliminating serious incidents remains one of industry's most persistent challenges.

More safety data alone is unlikely to change the trajectory. The opportunity lies in connecting information that has traditionally been analysed separately and testing it against a broader frame of reference. Critical-control performance can be considered alongside operating conditions, incident and investigation records, observations and organisational factors, while patterns within one operation can be tested against broader datasets, benchmarks and experience from other operating environments.

This can expose relationships that individual indicators obscure. Several weak signals, none significant in isolation, may together point to a meaningful change in risk exposure. Patterns across broader datasets may reveal conditions repeatedly associated with serious events, while experience from previous incidents can help identify similar conditions developing elsewhere.

Hands-on operational expertise is critical to interpreting these signals effectively. Industrial data carries context that analytical models may not fully capture: the task being performed, the operating environment, the effectiveness of a control in practice and the behaviour of the system or people under pressure. Combining analytical capability with operational judgement gives HSE leaders a stronger basis for deciding when and where to intervene.

The practical test is whether that intelligence can reach the operation early enough to change what happens next: helping an operator or supervisor recognise changing risk exposure; understand the critical controls that matter; and act before the risk is realised.

The ambition should reflect the capabilities now available: to make the next significant advance towards eliminating serious injuries and fatalities.

Directing safety effort towards fatal risk

A global cement manufacturer had more than a million safety records, yet lacked visibility into whether its safety efforts addressed its most critical exposures.

Using **dss*360**, dss* combined AI-enabled analysis with a proprietary risk taxonomy to reveal that less than 5% of safety observations addressed the organisation's top fatal risks.

The findings helped redirect resources towards the highest-risk activities, giving leaders a clearer basis for prioritising controls and intervention.



The same test applies to performance

For a COO, the opportunity is broader. Operations require significant human and technical effort to maintain reliability, manage variability and improve productivity, especially within the context of highly dynamic macroeconomic and geopolitical environment. Further improvement can require more: more maintenance activity, more supervision, more analysis, more controls, more information for frontline teams to navigate.

New capabilities create the possibility of being more selective about where that effort is directed. Recurring asset failures can be examined against operating conditions, production demands and maintenance histories to identify when intervention is warranted. Performance differences between sites can be tested against organisational and behavioural datasets to distinguish consequential differences from incidental ones.

For the frontline, greater precision can change how work is done. Operators and supervisors can spend less time navigating data and determining what requires attention. Engineers and specialists can focus on the assets, conditions and interventions where their expertise is most needed. Leaders can examine which activities genuinely contribute to reliability, safety or productivity, and where accumulated requirements are consuming capacity without a commensurate contribution to performance.

This raises a different productivity question: how much more could an operation achieve if it became better at deciding where human effort, expertise and intervention are actually required?

The result could be higher reliability and productivity, stronger control of risk and more effective use of the expertise and capacity already inside the operation.

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Where advantage comes from next

As advanced analytics, AI, sensors and connected technologies become more widely accessible, access to the technology alone is less likely to determine which organisations achieve superior operational results. The differentiator shifts to what surrounds the technology: the depth and quality of the data, the breadth of the benchmarks, the analytical lenses applied and the operational judgement brought to the results.

This makes operational expertise more valuable, not less. Industrial performance is highly contextual: similar patterns can have different causes, and similar interventions can produce very different results. Technology can surface relationships at a speed and scale that were previously difficult to achieve, but understanding their significance still requires knowledge of the asset, the process, the people and the conditions in which performance is being created or lost.

This is where dss+ has a distinctive role to play.

We combine deep operational and risk expertise with richer data, benchmarks, advanced analytics and AI to identify where value is at stake, understand what is shaping the outcome and determine where intervention can make a material difference. We then work within the operation to translate that intelligence into changes in decisions, routines and ways of working.

Conclusion

The capabilities available to industrial organisations are changing quickly. The leadership challenge is to translate that progress into a higher level of ambition for the operation.

- **Start with the operational problems where the value at stake is material and progress has proved hardest to sustain.**

Serious risk, recurring reliability losses, persistent variability and productivity constraints should determine where innovation is applied, rather than the availability of a particular technology.

- **Put accountability for the outcome with the business leader who owns it.**

Define the operational result that needs to change, the value at stake and how success will be measured before deciding which capabilities to deploy. Performance, adoption, risk and economics provide a stronger test of value than technical performance alone.

- **Use new capabilities to make the operation more precise, not more complex.**

Connect data across organisational silos, test internal experience against broader benchmarks and use analytics and operational judgement to identify where attention and intervention can have the greatest effect. Be equally prepared to remove activity that is consuming capacity without materially improving the outcome.

- **Design the change into the operation from the outset.**

New insight creates value only when it changes decisions, routines or how work gets done. That requires the people closest to the operation to understand and trust the intervention, with safety, cyber, data and human oversight built in from the beginning.

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About dss⁺

dss⁺ is the operational transformation partner for complex and high-hazard industries. We help organisations achieve breakthroughs in safety, performance and sustainability that drive lasting success.

Combining deep technical expertise and decades of hands-on experience with cutting-edge methodologies and data-driven insights, we empower teams to shift mindsets, shape cultures and build the capabilities needed at every level.

Additional information is available at www.consultdss.com



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