

Scaling MES Across the Enterprise

Insights on how manufacturers can move from deployment to enterprise-wide performance



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Executive Summary

Manufacturers have largely acknowledged the benefits of Manufacturing Execution System (MES) adoption — and are taking action — but scaling it has emerged as a challenge and a barrier to success.

As organizations expand their digital investments, many are finding that disconnected systems, underutilized data and rising complexity are limiting their ability to operate at scale. At the same time, the rapid acceleration of AI and increasing operational risk are raising the stakes for modern manufacturing systems.

Executive insights

Manufacturers have crossed the adoption threshold and now face the strategic work of scaling MES across the enterprise.



MES adoption is high, **but scale is the real challenge.**

While 93% of manufacturers report having MES in place, only 23% say it is fully integrated across their operations – leaving significant value unrealized across the enterprise.



AI is accelerating – **but systems aren't ready to support it.**

More than half of manufacturing processes are expected to be AI-supported by 2030, yet only 43% of manufacturers report using their data effectively.



Integration is now a top priority.

Integration ranks as both the #1 MES buying requirement (44%) and the top modernization challenge.



Resilience is becoming a system requirement.

Security and compliance now rank among the top factors in MES buying decisions.

Methodology

This survey reflects input from 1,560 hardware, software and services decision-makers across manufacturing and industrial operations globally. Respondents represent 17 leading manufacturing countries, spanning discrete, process, and hybrid industries. More than half (58%) work at organizations with over \$1B in annual revenue, and 54% are primary decision-makers, ensuring that the insights in this report reflect both strategic and operational leadership perspectives.

The findings in this publication are derived from the [11th Annual State of Smart Manufacturing Report.](#)

Chapter 01

The Maturity Gap

MES adoption has reached the mainstream; scaling it is now the challenge. While most manufacturers have implemented MES, far fewer have been able to extend it consistently across sites and systems:

93% 93% of manufacturers have an MES in place.

28% Just 28% have deployed MES enterprise-wide.

51% Half (51%) have scaled MES across multiple locations with standardization.

Despite widespread adoption, most MES deployments still run as a patchwork of separate systems — a reality that restricts visibility and coordination across operations. Only 23% report that their MES achieves full integration across ERP, PLM, quality and OT systems.

Scaling defines the next phase of MES maturity

The shift from implementation to operationalization is now the defining challenge. Manufacturers have moved past the question of deploying MES and now focus on making it work consistently across the enterprise.



Chapter 02

Integration Is the Foundation for Scale

As manufacturers move beyond deployment, integration has emerged as the condition that determines whether MES can deliver value at scale. It now shapes buying priorities, modernization strategy and the path to broader digital maturity.

Integration ranks as both the top MES buying requirement and modernization challenge, **cited by 44% of manufacturers as the most important factor in their purchasing decisions**. While integration poses challenges, manufacturers increasingly recognize a need to break down operational siloes.

Despite increased focus, many organizations still struggle to connect MES across enterprise systems:

23% have fully integrated MES.

33% cite MES as a top data integration challenge.

These figures point to a clear reality: the majority of MES deployments are functioning in partial isolation, limiting the data flows and operational visibility that make MES transformative. The organizations that succeed will be those that treat integration as a foundational design principle rather than a downstream activity.



Chapter 03

The Widening Gap Between AI Ambition and Operational Readiness

Manufacturers widely embrace AI. They expect 42% of manufacturing processes to become AI-supported within the next year – and rise to more than half (54%) by 2030. IDC reinforces this trajectory, predicting that by 2028, **65% of G1000 manufacturers** will use AI agents alongside design and simulation tools to ensure product requirements flow continuously through design changes.¹

AI is scaling faster than the systems required to support it

The operational foundation that AI requires to perform at scale, however, is not evolving at the same pace. AI is advancing faster than the data infrastructure required to sustain it.

Three barriers reinforce this AI readiness gap:

- Data security: 28%
- Cost: 28%
- ROI uncertainty: 15%

¹IDC Blog Post, [Charting the AI-Driven Future of Manufacturing](#) November 12, 2025.

These barriers point to a broader readiness challenge. Manufacturers are advancing AI strategies while still working to strengthen the system environment that supports secure, scalable and high-value AI use.

Data quality shapes AI outcomes

AI performance depends directly on data quality. Yet 43% of manufacturers acknowledge they are falling short of using their collected data effectively. Among those reporting that their data creates meaningful value, 38% point to AI and machine learning use cases, with quality (36%) and process optimization (35%) close behind. The distance between what manufacturers are collecting and what they are actually activating represents both a risk to AI performance and a substantial opportunity for organizations ready to close it.



Chapter 04

The Resilience Imperative

Greater connectivity brings greater exposure. Nearly half (46%) of manufacturers experienced a cyber incident in the past year.

As operations grow more connected — across sites, systems and supply chains — the attack surface expands alongside the operational benefits. Manufacturers are responding to this reality by elevating resilience from a supporting consideration to a core system requirement.

Manufacturers increasingly prioritize security and compliance as part of system design

Security and compliance now rank as the second-highest MES buying requirement, cited by 43% of respondents — just behind integration (44%). This represents a meaningful shift in how manufacturers are evaluating and selecting systems. Resilience considerations are moving up the decision-making hierarchy.

Resilience belongs in the execution layer

The manufacturers building resilient operations understand that systems that embed protection, visibility and adaptability directly into the execution layer are structurally different from systems that layer those capabilities on after deployment. Legacy approaches reflect the older model. Modern MES strategies reflect the new one — where security and compliance are design principles, built in from the beginning and sustained across the enterprise.



Analyst Perspective

Manufacturers have moved past the question of whether to adopt MES and are now confronting the harder challenge of scaling it. With integration ranking as both the top buying requirement and the leading modernization challenge, organizations risk leaving significant value on the table if disconnected systems and underutilized data go unaddressed. As AI-supported processes become the expectation rather than the exception, the ability to unify systems and activate data will determine which manufacturers are positioned to compete in the next era of production.”

LORENZO VERONESI

Associate Research Director, IDC

Manufacturers in Action

Leading manufacturers are already putting these principles into practice. Companies like Moldtech, Portland Bottling Company, Bayrak Technik, and West-Bake demonstrate how organizations are closing the MES maturity gap.



Portland Bottling Company achieved 99% inventory accuracy, 100% shipping accuracy and a 10% increase in productivity.

"We're a beverage co-packing operation. We produce and warehouse products on behalf of our customers. Tracking our customers' inventory accurately is paramount to our business. MES enables us to do this efficiently and easily report on hand balances and warehouse charges."

Robert Van Blake

IT Director, Portland Bottling Company

[View Full Case Study](#)



Moldtech decreased scrap costs by 50%, improved efficiency by up to 20% and saved \$25,000 in Q1 alone.

"We wanted a solution that gave us real time inventory levels, live production metrics, and accurate costing. We have live scrap reporting available to us now, allowing us to know exactly what impact our scrap will have on month end bottom-line."

Edward Halady

President, Moldtech Inc.

[View Full Case Study](#)

These real-world outcomes highlight what becomes possible when manufacturers move from fragmented systems to unified platforms that deliver real-time visibility, standardized operations and measurable business performance.

7 Steps to Scale MES and Modern Manufacturing Operations



STEP 01

Standardize MES across Sites.

Scaling begins with consistency. Most manufacturers have deployed MES, but they miss this important first step: establish a standardized MES foundation across plants to eliminate variability and enabling scale value unrealized across the enterprise.



STEP 02

Prioritize Integration from the Start.

Once a consistent foundation is in place, integration connects systems and eliminates silos. Integration should function as the foundation of digital transformation success – a first-order design decision rather than a downstream effort.

Connect MES with ERP, quality and OT systems early in the process to ensure data flows seamlessly across the enterprise.



STEP 03

Align Ownership Across Functions.

Scaling MES is as much an organizational challenge as it is a technology one. Once systems connectivity is in place, coordination becomes the next imperative.

Manufacturers must align teams, governance and decision-making across IT, OT and operations teams to standardize and execute successfully. Create common KPIs and metrics for cross-department teams to ensure everyone works toward the same goals.

7 Steps to Scale MES and Modern Manufacturing Operations

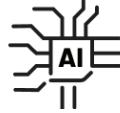


STEP 04

Turn Data into Operational Insight.

Collecting data is the starting point. Using it is the real challenge. After building the systems and processes to gather data consistently, manufacturers must move beyond simple visibility to gain real-time, actionable insights that inform decisions on the plant floor.

Embed analytics directly into operational processes to activate data within workflows — from triggering alerts to automating responses — and help frontline teams act on insights in real time.



STEP 05

Build for AI-Ready Operations

Forty-eight percent of manufacturers believe AI is delivering the biggest outcomes across the enterprise. As data becomes more accessible and actionable, manufacturers must build the critical foundation needed to move toward advanced capabilities.

Create a connected, contextual data environment to ensure AI can move from the experimentation phase to achieve scalable impact. The organizations that build this environment deliberately will extract the most value from their AI investments.



STEP 06

Embed Resiliency into the System.

One of the many problems with legacy systems is that resiliency exists outside the original system design, and it is difficult to layer it on after deployment. Modern MES strategies must incorporate security, compliance, and adaptability directly into operations to withstand disruption and scale with confidence.

7 Steps to Scale MES and Modern Manufacturing Operations



STEP 07

Empower Employees to Operate Differently.

As technology evolves, so must the people who drive it. More than one-third (37%) of manufacturers identify change management as a key workforce obstacle. On average, 40% of workforces have participated in reskilling programs in the past year, and 39% of manufacturers are introducing AI and ML to address the skills gap.

Manufacturers must equip their workforce with the tools, training and processes needed to act on real-time data and operate in more connected, automated environments. Building this training layer is an ongoing activity to enable continuous learning and improvement.

These seven steps translate the findings in this report into a [practical framework to close the MES maturity gap.](#)



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