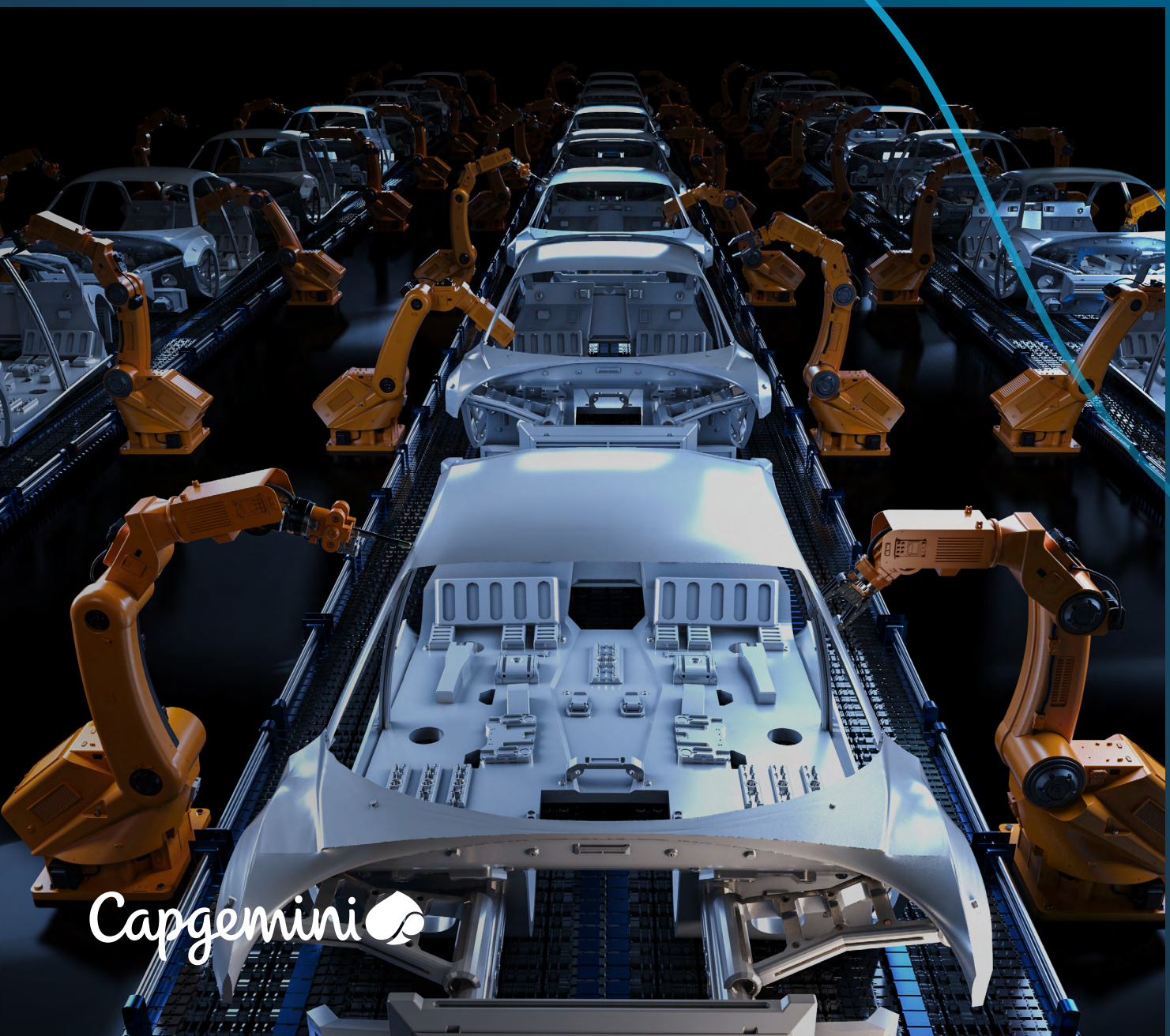
Revolutionizing Automotive Manufacturing

Assessment and Consulting Journey for Next-Gen MES



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Introduction

The automotive industry has entered a decisive phase. Technology is advancing at breakneck speed, regulations are tightening, global trade remains volatile, and electrification is accelerating. At the same time, customers now expect speed, transparency, and deep personalization from real-time order updates to made to order configurations, pushing manufacturers beyond the limits of traditional, linear assembly models. Together, these forces are ushering in the era of the Intelligent Industry, where data, connectivity, and automation determine competitiveness.

For OEMs, incremental change is no longer enough. Winning now requires rethinking how vehicles are designed, built, and delivered treating data as a strategic asset, embracing intelligent manufacturing principles, and modernizing plants to be **agile, modular,** and **digitally connected**. This is not just a technology upgrade; it's an operational reinvention aimed at speed, quality, sustainability, and resilience.

According to Capgemini research, Manufacturers are doubling down on digital transformation, and MES is taking the center stage.

54%

of organizations have already achieved more than 20% in cost savings by adopting digital technologies in their reindustrialization journey

84%

of organizations are planning further investments, and 62% upgrading their facilities to be smarter and tech-enabled.

Source: The resurgence of manufacturing Reindustrialization strategies in Europe and the US – 2025

At the center of that reinvention is the Manufacturing Execution System (MES) the factory's digital nerve center. MES connects **people, machines, and processes**; orchestrates production from raw materials to finished vehicles; and provides real-time visibility and control that traditional systems can't match. In short, it's the backbone that turns discrete, siloed operations into a synchronized, data driven ecosystem.

Next-gen MES goes further. It doesn't just monitors & record events; it optimizes them. It integrates with IIoT platforms, digital twins, and advanced analytics; enforces quality and traceability by design; and scales across products, plants, and business models. Built on modern, interoperable architectures and deployable on premises, in the cloud, or in hybrid models, it supports rapid change while strengthening security and compliance.

The benefits are tangible: live factory visibility that surfaces bottlenecks before they bite; closed loop quality that detects defects early and prevents recurrences; smarter decisions powered by contextualized data and actionable guidance; and more effective human machine collaboration through intuitive, role-based experiences. The result is a factory that learns, adapts, and performs consistently and at scale.

An MES can deliver quantifiable improvement in many areas:

8%	45%	45%	50%	75%
Reduction is Scrap	Reduction in Lead Time	Reduction in Cycle Time	Reduction in Labor Cost	Reduction in Reject Rates

Source: Building the business case for MES

A Practical Journey: How OEM Pivoted to Next Gen MES

What does this transformation look like in the real world? Below is a clear, five stage journey distilled from an OEM's experience that any automotive manufacturer or its suppliers can adapt. Each stage builds on the last, ensuring momentum, alignment, and measurable value.

01

Align the Ambition

The OEM began by establishing a shared vision at the leadership level: what "intelligent manufacturing" should deliver for customers, operations, and the business. Together with a specialized Manufacturing Execution System consulting team, the team outlined the MES Assessment & Consulting **LEAD framework** that guided this collaboration. In close collaboration with leadership, the Manufacturing Execution System consulting team translated that vision into concrete priorities flexibility to respond to demand swings, higher throughput and OEE, stronger in process quality, streamlined materials flow, and better maintenance integration to reduce downtime. These priorities became the north star for every subsequent decision.

	Organization Competency	Functionalities & Capabilities	MES Vendor Engagement
L Learn	Workshops for Industry 4.0	Best in class 70+ from Social Insights	RFI & Evaluation Creation
E Evaluate	Smart Industry Maturity	Bucketing 20 MES Products	Top 5 MES RFI Response
A Access	Leadership Priorities	Agreement of Scoring Methodology	Top 2 MES Techno functional Demonstration based on RFP
D Deliver	New Capabilities	Top notch 10 MES Vendors	Best MES/MOM Product
	Month 1	**Month 2**	**Month 4**

02

Diagnose the Current State

With the ambition set, the next step was a rigorous, plant by plant assessment. Using assessment frameworks such as the **Smart Industry Readiness Index (SIRI)** covering process, technology, and organization the team quantified digital maturity and surfaced the biggest constraints: fragmented systems with limited vertical/horizontal integration, rigid point-to-point interfaces, and patchy real-time visibility. This "asis" assessment created a common baseline for change and highlighted where investment would yield the greatest impact.

The TIER framework aims to **assist companies in quantitatively identifying the high-priority SIRI Dimensions where improvements will bring the most benefit.**

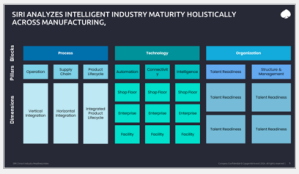
T Today's state (assessment matrix score)

I Impact To Bottom Line (Cost profile)

E Essential Business Objectives (Key Performance Indicator)

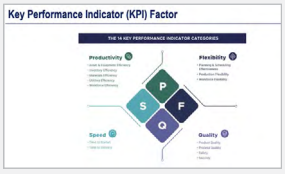
R Reference to the broader Community Industry Best-in-class benchmark)

Assessment → **Prioritisation**



Develop an In-depth understanding of the company's current Industry 4.0 maturity Level

Analyze how distinct Industry 4.0 areas affect the company's profits and identify those that can generate financial return

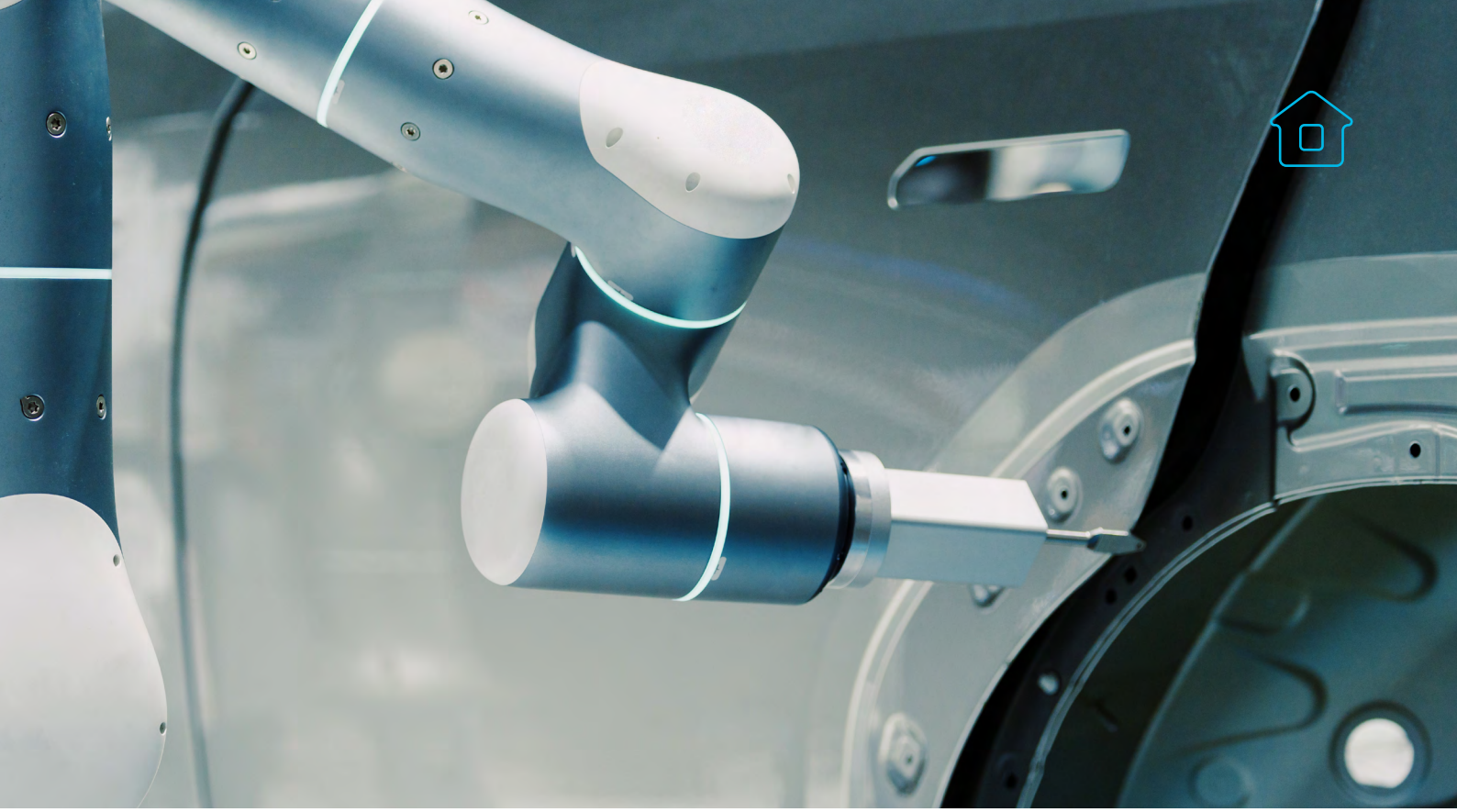


Determine the business objectives that are most critical to the company to guide the selection of relevant Industry 4.0 areas

Emulate successes and learn from the mistakes of the broader manufacturing community

Results report:

- ! All assessed and prioritised dimensions (with scores)
- ! 4 individual Industry 4.0 focus dimension to improve
- ! Comments on how to improve these dimensions



03

Define the Future Capabilities

Armed with facts, the OEM and MES consultants mapped the capabilities a NextGen MES must deliver:

- Architecture & Deployment: Interoperable by design; modular and upgradable without disruption; options for on prem, cloud, or hybrid deployment.
- Data, Intelligence & Analytics: Contextualized data models; real-time dashboards; predictive and prescriptive analytics; native hooks for IIoT, digital twin, and AI services.
- Operations & Quality: Advanced scheduling and routing; tight machine connectivity; in-process quality with automated checks, alerts, and corrective workflows; end-to-end traceability and compliance.
- User Experience & Adoption: Role based, intuitive UI; mobile and wearable support; experiences that shorten training and improve adoption.

This capability model prevented "feature sprawl" and ensured every requirement tied back to business outcomes.

04

Scan the Market and Down Select

The team assessed and evaluated a broad landscape of 70+MES products, then applied a structured evaluation combining critical capability scoring, industry relevance, technology readiness, and reference ability to narrow the field to 20 products and further down to 10 products. Shortlisted vendors progressed through RFI/RFP stages and scenario-based demonstrations focused on real workflows and integration needs (PLM, ERP, shopfloor automation). The goal was not to see the most features it was to prove fit for purpose against the OEM's specific priorities and future roadmap.

MES Products

70+	20	10	5
List of MES Products	Top 20 MES Products	Knockout tool for Top10	RFI Evaluation Criteria for Top 5

05

Roadmap, Mobilize, and Scale

With the preferred solutions identified, the OEM along with the consulting team launched a pragmatic rollout plan:

- Phased deployment starting with a lighthouse line, then scaling by product family and plant managing risk without stalling momentum.
- Integration by design to orchestrate MES with ERP, PLM, and automation layers for end-to-end flow.
- Change management that engaged operators, supervisors, and maintenance teams early, pairing training with co-designed work instructions.
- Clear KPIs (e.g., first pass yield, cycle time adherence, schedule attainment, MTBF/MTTR) tracked on shared dashboards to reinforce value and guide continuous improvement.

This approach balanced speed with stability and set the foundation for continuous innovation.

Why This Matters Now

The shift to software defined vehicles, electrified platforms, and hyper personalized orders is rewriting factory logic.

OEMs need plants that can change over quickly, scale new variants without chaos, and maintain impeccable quality under pressure. A Next-gen MES makes that possible creating the connective tissue that synchronizes processes, data, and decisions from the shop floor to the boardroom.

For small and mid sized enterprises and consultants alike, the lesson is clear: start with alignment, measure what matters, choose capabilities before products, demand proof through scenarios, and scale with discipline. Do this, and MES stops being “software for the shop floor” and becomes a strategic lever for growth, resilience, and sustainability.

The Payoff

By following this path, the OEM moved from fragmented, reactive operations to a cohesive, data driven system that adapts in real-time. Operators gained clearer guidance, quality stabilized upstream, maintenance became predictive, and leaders finally had end-to-end visibility to steer performance. **The factory didn’t just get smarter it became *future ready.***

Closing Thought

Intelligent manufacturing isn’t a destination; it’s a capability you build. Next-gen MES is how you build it one aligned decision, one capability, one plant at a time.

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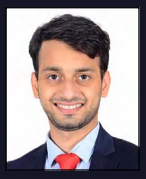

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