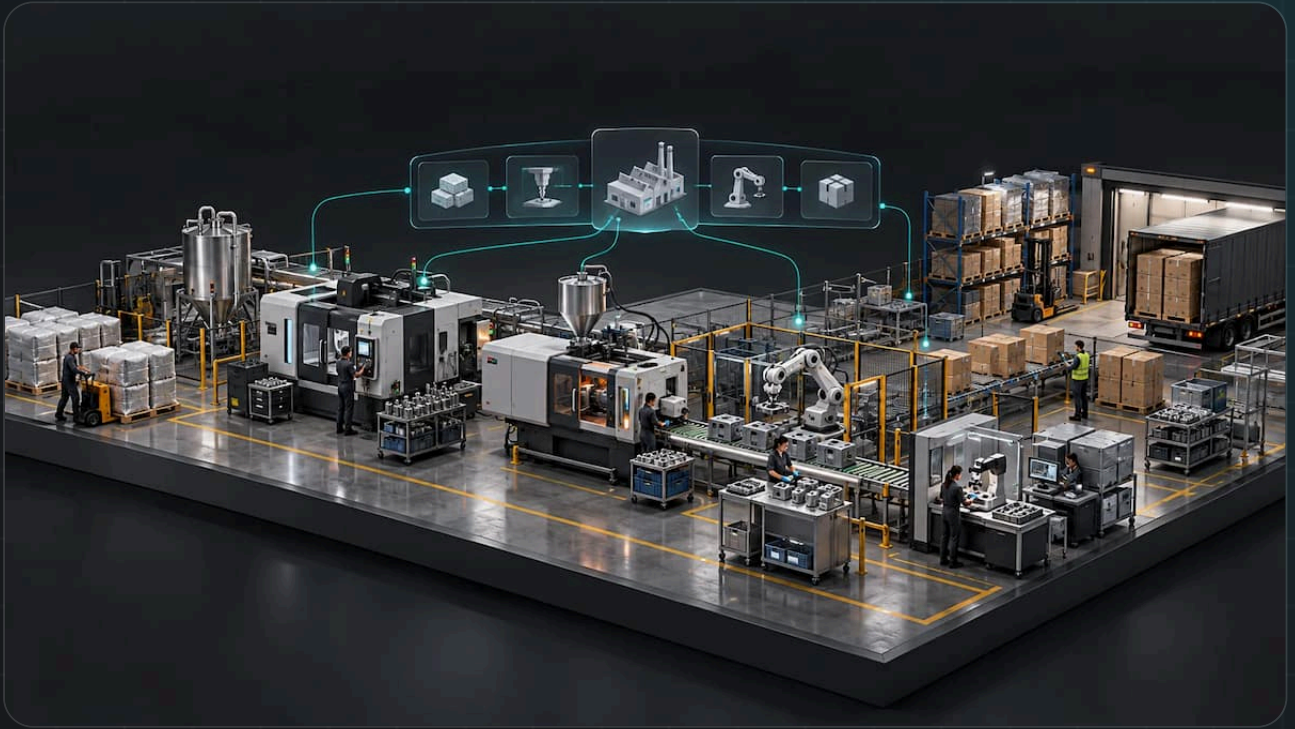


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What Is MES?

A Guide to Production Management and Digital Transformation



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ABSTRACT

MES is the system that tracks which job is carried out on the shop floor, with which resources, how and with what result, and that manages the execution of production. Short for **Manufacturing Execution System**, MES brings work orders, machines, operators, materials and quality records together in the same production context.

In a production meeting you can find out whether a machine is running. The hard part is seeing, all at once, which order is being produced, the good quantity, the cause of losses, the lot used and the impact on the delivery date. An MES investment aims to answer these questions with reliable data and to enable action when needed.

Keywords: MES · Production Management · OEE · Digital Transformation · Traceability · ERP · AI

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Introduction

This guide is written for companies researching MES for the first time, production teams looking to improve their existing system and managers who will make the investment decision. Success should be measured not by the number of screens, but by the problems solved on the shop floor and sustained use.

What will you find in this guide?

- The meaning of the term MES and a brief history
- The differences between ERP, MES, SCADA, IoT and APS
- The benefits for the business and how to interpret OEE correctly
- Investment costs and a sample return calculation
- Project team, implementation time and pilot acceptance criteria
- Points to watch in integration, data security and vendor selection
- Stages of digital transformation, AI and the digital twin
- A pre-purchase checklist and frequently asked questions

1. What does the term MES mean?

Manufacturing refers to making or producing goods; **execution** to carrying out the planned work on the shop floor; and **system** to the system that supports this. In Turkish it is called "Üretim Yürütme Sistemi" (Production Execution System), and the term "Üretim Yönetim Sistemi" (Production Management System) is also frequently used.

The key concept here is **execution**: Which work order can be started? Are the right material and mold ready? Which instruction should be shown to the operator? Has first-article approval been obtained? Was the produced part accepted? Depending on the chosen scope and integrations, MES records, guides and supports these steps with rules. ¹

A simple example

Imagine a plastic injection molding machine is given a work order for 10,000 units. MES can handle the following information together:

1. The work order, product, mold and raw material lot used.
2. The machine's cycles, shot count and number of active cavities.
3. Good output, scrap, rework and downtime reasons.
4. Operator, shift, quality measurements and first-article approval.

5. The box or pallet label with which the output was transferred to the warehouse.

Shot count, product quantity and good product quantity are not the same thing. If multi-cavity molds, blocked cavities and scrap are not taken into account, even an automatic counter can produce an incorrect production table. These definitions should be clarified at the start of the project.

2. A brief history of MES

The roots of MES go back to computer-based monitoring of production data and shop-floor control applications. Its development is less the result of a single product launch than of the need to close the gap between production and business systems.

Table 1

Period	Prominent approach	Impact today
1970s–1980s	Computer-aided production tracking and standalone shop-floor applications	Laid the foundation for digitalizing machine and production records.
1990s	Emergence of the MES concept and common functional models	Production execution came to be treated as a distinct software domain.
2000s	ERP–shop floor integration and standard information models	Sharing of work order, resource and actual production data between systems improved.
2010s	IIoT, mobile access, cloud and advanced analytics	Connecting more resources and monitoring multiple sites together became easier.
2020s	AI-assisted analysis, edge computing and simulation	The shift from displaying data towards investigating causes and decision support accelerated.

This table is a general historical framework; technologies did not become widespread at the same time in every industry. MESA records its founding as 1992. The ISA-95 family provides an important common framework for information exchange between business planning and manufacturing operations. ²³

3. What is the difference between MES, ERP and automation?

ERP manages the company's plan and resource records; MES manages how that plan is carried out on the shop floor. PLC and automation systems handle control of the physical process. Although the boundaries may overlap depending on the product, project responsibilities should be clearly defined.



Figure 1. Simplified functional relationship: ERP passes down the plan, MES executes production and feeds back actual results. The image is not a network security topology.

Table 2

System / concept	Core question it answers	Relationship to MES
ERP	What will be sold, what will be procured, which resources will be planned?	Can be the source of information such as orders, stock, bills of materials, routings and work orders.
MES	Which job is being executed right now and how, what was produced, what loss occurred?	Brings together the execution and records of production operations.
PLC / SCADA	How is the process controlled, which signal or alarm occurred?	Can provide machine states and process data. Safety control remains in the appropriate automation layer.
IoT / data acquisition	What data can be obtained from which device?	Provides connectivity and measurement; on its own it does not create work orders or material genealogy.
APS	Which job should we schedule in which order under constraints?	Can use MES actuals to feed scheduling and scenario analysis.
MOM	How are manufacturing operations managed as a whole?	A broader management framework that overlaps with MES and covers production, quality, maintenance and inventory operations.

In the ISA-95 approach, business planning activities fall mainly under Level 4, and the management of manufacturing operations under Level 3. This does not mean that a single piece of software must cover all layers.³

Is MES just a machine monitoring screen?

No. Seeing that a machine is running is only the starting point. The data needs to be linked to the work order, product, operator, material and quality result. Calling a solution "MES" does not guarantee that it includes all functions either. Describe your needs not with module names, but with the scenarios that must work on the shop floor.

4. Which processes can MES cover?

Not every company needs to switch on every module from day one. The right scope is chosen based on the production type, customer expectations and the priority loss. ⁴

Table 3

Area	Example function	Question to ask in the initial assessment
Work orders and operations	Start, pause, complete, display instructions	How does the operator select the right job and revision?
Production and downtime	Cycle, quantity, lost time, reason code	How will counter values be matched to actual production?
Quality	First article, periodic measurement, accept/reject, rework	How will the passage of nonconforming product to the next operation be managed?
Materials and traceability	Lot/serial, consumption, box/pallet, production genealogy	How far back can we trace a shipment to material and process records?
Maintenance	Breakdown reporting, intervention, link to planned maintenance	Are downtime and maintenance action tracked through the same event?
Planning and capacity	Tracking actuals, load view, APS link	How will the difference between planned and actual time be fed back?
Analysis and notifications	KPIs, alarms, assigning responsibility, action tracking	When an alert comes in, who does what, and within what time?

5. What are the benefits of MES for a business?

Visibility: seeing the situation without waiting for a report

A properly implemented system makes information that is normally compiled at the end of a shift visible during production. This makes it possible to spot a delayed job, frequently recurring downtime or a quality deviation earlier. How many seconds or minutes of delay "real-time" data may have should be defined in the project acceptance criteria.

Separating losses: breakdowns, waiting, setup and speed loss

Total downtime alone is not enough to drive action. Waiting for material, mold changes, breakdowns and unplanned job changes require different owners. Correct classification lets improvement meetings move from debate to concrete tasks.

Traceability: tracing back from the finished product

When a problem arises with a part, being able to find the lot, machine, mold, shift and quality records used can shorten investigation time and make it easier to determine the affected scope. This requires lots not merely to be scanned, but to be linked to actual consumption and transformation records.

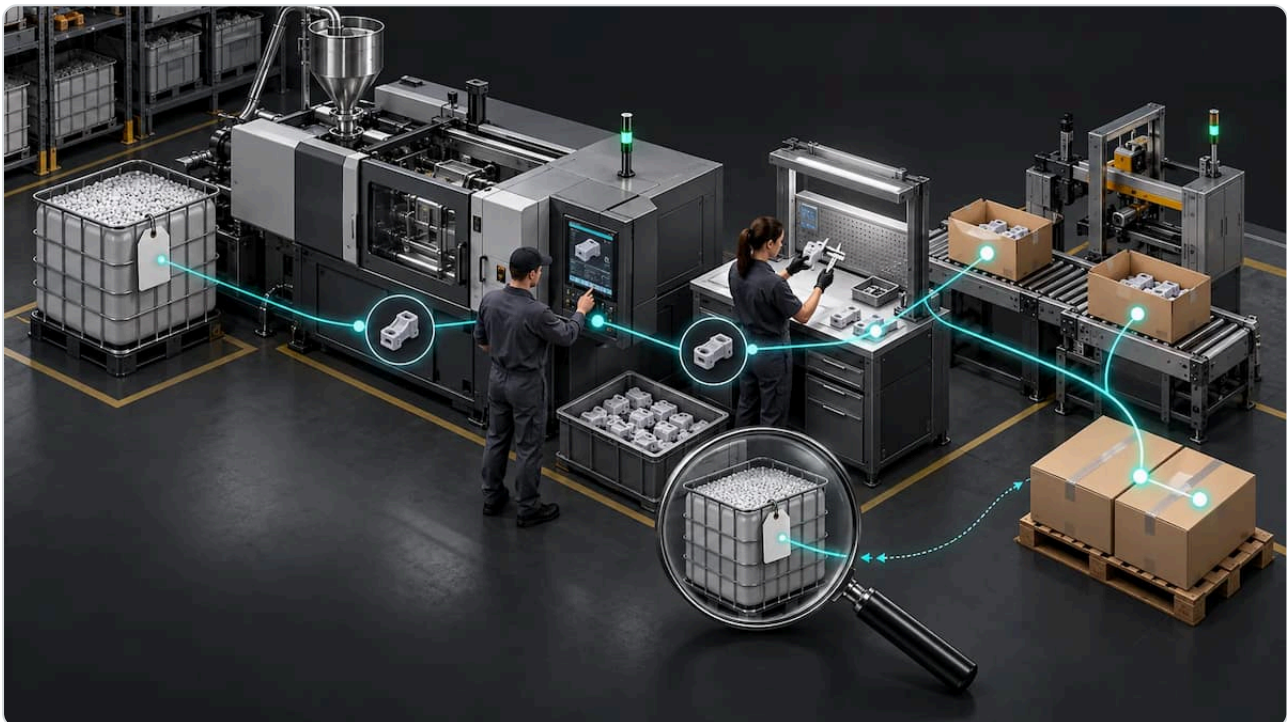


Figure 2. Traceability is more than a barcode image: it means preserving which material is linked to which production and quality record.

More reliable delivery and capacity information

Visibility of work order progress, work-in-progress and bottlenecks gives planning more reliable feedback. However, delivery dates also depend on other constraints such as materials, supply, staffing and routings. MES alone does not guarantee on-time delivery.

Seeing the components of production cost

If material, time, energy, scrap and labor data are sufficient, cost analysis can be carried out per product, work order or cycle. Its accuracy depends on the accuracy of rates, consumption figures, shared resource allocations and costing rules. Operational cost calculated in real time does not have to match the accounting cost finalized at period end.

Managing expectations: Implementing MES does not by itself increase productivity. Reliable data, owners taking action and tracking of results are all required together. Do not base your decision on a universal "it saves this much" percentage.

6. What is OEE? How should it be used in an MES project?

OEE is an indicator used to evaluate overall equipment effectiveness. The general calculation is:

OEE = Availability × Performance × Quality

- **Availability:** Run time / planned production time.
- **Performance:** Ideal cycle time × total units produced / run time.
- **Quality:** Good units / total units produced.

For example, if availability is 95%, performance 80% and quality 100%, OEE is **76%**. The percentages are entered into the formula as $0.95 \times 0.80 \times 1.00$.

Before calculating, agree on planned production time, breaks, the ideal cycle and the definition of a good product. With multi-cavity molds, the units of cycles and product quantity must be consistent. How parts sent for rework are counted must also be clear.

Do not make OEE a target on its own. Producing unnecessarily when there are no orders can raise OEE while increasing inventory costs. Interpret OEE together with delivery, quality, energy, work-in-progress and bottleneck performance. Do not directly compare the scores of two plants working with different product mixes and calculation rules.

For a step-by-step calculation, the Six Big Losses and the capacity impact, see [our What Is OEE? guide](#).

7. What does the cost of an MES investment depend on?

"How many machines do we have?" is an important question, but on its own it is not enough for pricing. Two plants with the same number of machines may have completely different connectivity options, quality processes and ERP scope.

Main cost items

Table 4

Item	What is assessed?	What the offer should make clear
Software	Modules, users, machines, sites, subscription or license rights	Which functions and which limits are included
Shop-floor hardware	Data acquisition board, gateway, panel PC/tablet, scanner, printer, sensor	Use of existing devices and installation scope
Integration	ERP, PLC, OPC UA, API, scales, test equipment, quality system	Read/write direction, data fields, error handling and tests
Infrastructure	Network, Wi-Fi coverage, server/cloud, backup, security	Separation of capital and recurring expenses
Implementation	Analysis, data cleansing, configuration, shop-floor commissioning	Effort, travel, change management and acceptance scope
Training and operation	Shift training, support, version upgrades, maintenance	Support hours, response targets and annual fees
Internal team time	Work by production, quality, maintenance, IT and key users	Time and owners the company needs to allocate

A budget scenario with a defined scope instead of a price example

The figures below are a **hypothetical example created solely to illustrate the calculation method**. They are not a market average, current price research, an OETECH offer or a price commitment for a specific number of machines. EUR was chosen as the currency for ease of comparison; tax, financing and exchange rate effects are not included.

Table 5

Example initial investment component	Hypothetical amount
Initial software scope	12,000 EUR
Hardware and shop-floor connections	6,000 EUR
Integration and commissioning	6,000 EUR
Infrastructure and security preparation	2,000 EUR
Training, data preparation and internal team effort equivalent	4,000 EUR
Total initial investment	30,000 EUR

If this example also assumes an operating/support cost of 500 EUR per month, the first-year total is **36,000 EUR**, and the total cost of ownership over three years, without additional investment or price changes, is **48,000 EUR**. In a real project, renewals, scope expansion and internal team continuity are calculated separately.

Compare offers on the same scope. The cheapest starter package can turn into more expensive operation due to missing integrations, mandatory additional licenses or data export restrictions. Conversely, a broad scope you do not need also creates unnecessary investment.

8. How is return on investment calculated?

First measure the current situation. Then determine which data you will use to verify the benefit expected from the improvement. A gain in production capacity is not always a cash saving; you need to be able to sell that capacity or genuinely reduce overtime.

Let us continue with the previous example:

- Hypothetical initial investment: **30,000 EUR.**
- Verifiable additional contribution and savings: **2,500 EUR/month.**
- Recurring operating/support cost: **500 EUR/month.**
- Monthly net benefit: **2,000 EUR.**
- Simple payback: **$30,000 / 2,000 = 15$ months.**

This is a simplified example, not investment advice or a guarantee of results. It does not include the ramp-up of benefits during commissioning, tax or the time value of money. If you have deducted operating costs from the monthly benefit, do not count them twice by adding the same cost back to the investment amount.

Avoid double counting: Do not record the same gain three times as recovered machine hours, additional output and sales revenue. Evaluate the improvement separately from changes in product mix, demand and shifts. The finance team should validate the benefit calculation together with the project team.

9. Which team should an MES project start with?

MES is not just an IT project. Production owns the process; IT, automation, quality and other teams work together. In smaller companies one person may take on several roles; what matters is that no responsibility gets lost.

Table 6

Role	Core responsibility
Executive sponsor	Owns goals, resources, priorities and cross-team decisions.
Company project lead	Drives scope, schedule, decisions and the acceptance process.
Production / planning representative	Validates work orders, routings, shifts, cycles and shop-floor flow.
Shift key users	Try out screens on the shop floor, provide training and feedback.
Quality representative	Defines accept/reject, control plan, lot/serial and rework rules.
Maintenance / automation	Validates signals, device connections and safe installation.
IT / cybersecurity	Designs network, identity, access, servers, backup and operation.
ERP / integration owner	Clarifies data ownership, interfaces and error scenarios.
Finance / costing	Validates the benefit calculation and, if needed, the cost allocation model.
MES solution team	Carries out analysis, configuration, integration, training and commissioning.

Set up a short weekly project meeting, an open decision log and a single scope record. Rather than key users joining the project "when they have spare time", working time should be reserved in their schedules.

10. How long does it take on average? What roadmap should be followed?

Duration depends on process maturity, data readiness, machine access, integration and how much time the internal team can dedicate. The ranges below are **for preliminary planning only; they are not an industry average, a contract term or an OETECH delivery commitment**:

- **Limited pilot:** Around 6–12 weeks with ready infrastructure and a narrow scope.
- **Initial operational scope at a single site:** Around 3–6 months.
- **Multi-site or comprehensive transformation:** 6–18 months or longer, split into phases.

Example 16-week initial scope

Table 7

Period	Work	Output for moving to the next phase
Weeks 1–2	Site discovery, current state, goals and scope	Approved process map, priorities and success criteria
Weeks 3–5	Master data, connectivity and infrastructure preparation	Validated signal list, data dictionary and interface design
Weeks 6–8	Pilot installation and core integration	An end-to-end scenario running on selected machines/operations
Weeks 9–12	Shift tests, training, corrections	User acceptance records, reconciliation and outage tests
Weeks 13–16	Controlled rollout and stabilization	Handed-over support process and first improvement review

Some work can run in parallel. Old machines, missing ERP interfaces, complex lot consumption or site access restrictions can extend this schedule. The purpose of the pilot is not just to show screens, but to validate the suitability of the solution under real operating conditions.

Where should the pilot be run?

Do not simply choose the easiest machine to connect. Choose an area that represents the company's real problem, where results can be measured and which the team can access. In the pilot, complete the necessary flows such as starting production, downtime, quality, labelling and ERP feedback. Rather than trying to switch on every function at once, genuinely finish the chosen scope.

11. Which acceptance criteria will we use to measure success?

Criteria should be written at the start, not at the end of commissioning. The items below are examples; agree on target thresholds together based on shop-floor risk.

- ☐ The distinction between counter, shot, product and good quantity has been validated.
- ☐ An accepted tolerance between reference counts and system data has been defined.
- ☐ Shift changeover, midnight and work order changes have been tested.
- ☐ Downtime start/end and reason code corrections are recorded.
- ☐ Work orders closed or cancelled in ERP are handled correctly.
- ☐ A duplicate message does not create the same production or consumption a second time.
- ☐ Records stay reconciled through connection loss and reconnection.
- ☐ Within the relevant scope, the production and quality history of a box/lot can be found.
- ☐ Unauthorized users cannot change critical records; an audit trail of changes is kept.
- ☐ Restore from backup and support responsibility have been tested and handed over.
- ☐ Users from different shifts can perform the basic operations.

Stating a data accuracy percentage on its own is not enough. Which data field, which reference, how many shifts and which sampling method will be used to measure it? These questions should also be added to the acceptance plan.

12. Technical and operational points to watch

Master data and unique identifiers

Machine, product, work order, routing, mold, lot and operator codes must be consistent. Tracking the same product in different units in two systems, or recording the same machine under different names, corrupts reports. It should be documented which system is the master source of which data.

Old machines and connectivity options

Where appropriate, data can be obtained from the PLC or existing interfaces. For machines where this is not possible, sensors, counters, gateways or data acquisition boards can be considered. Manual operations can also be brought into scope through operator input and barcodes. The choice should be based on safety, data needs and maintainability.

Wireless connectivity offers installation flexibility, but metal density, the electromagnetic environment and coverage should be measured. Whether wired or wireless, time synchronization, device health and data loss scenarios should be assessed.

Integration and outage behavior

Define the direction of work orders, actual production, consumption and stock movements. There should be a unique message ID, retry, sequencing and reconciliation mechanism. When the internet connection drops, which operations will continue locally, which will wait, and how much data will be buffered? These are part of the architecture and the tests.

Security and access

The machine network, corporate network and remote access should be separated in a controlled way. Role-based permissions, strong authentication for administrative access, logging, secure remote support and backups with tested restores should be considered. Exposing a PLC or database directly to the internet is not required for remote visibility. In an OT environment, security measures should be designed together with performance, availability and process safety. ⁵

Employee engagement

Screens should be suited to the production environment and kept short. Asking operators to enter unnecessary data every cycle makes the system harder to use. Data that can be captured automatically should be captured automatically; the reasons and explanations where people provide context should be simplified. The purpose of measurement should be clearly communicated as reducing losses and improving the process.

13. Cloud, on-premises or hybrid: which is right?

Table 8

Architecture	Strength	What to verify specifically in the design
On-premises	Shop-floor control and operation within the local network	Server operation, redundancy, secure external access and maintenance
Cloud	Central access, consolidating sites and resource flexibility	Connectivity dependence, data location, retention and service terms
Hybrid	Balance between shop-floor continuity and central analysis	Edge buffering, synchronization, ownership and post-outage reconciliation

The choice should not be a matter of fashion. Outage tolerance, customer data policy, storage volume and internal IT competence should be assessed together. Moving all raw data to the cloud indefinitely is not the best option for every company, nor is keeping every function on-premises.

14. What are the stages of digital transformation?

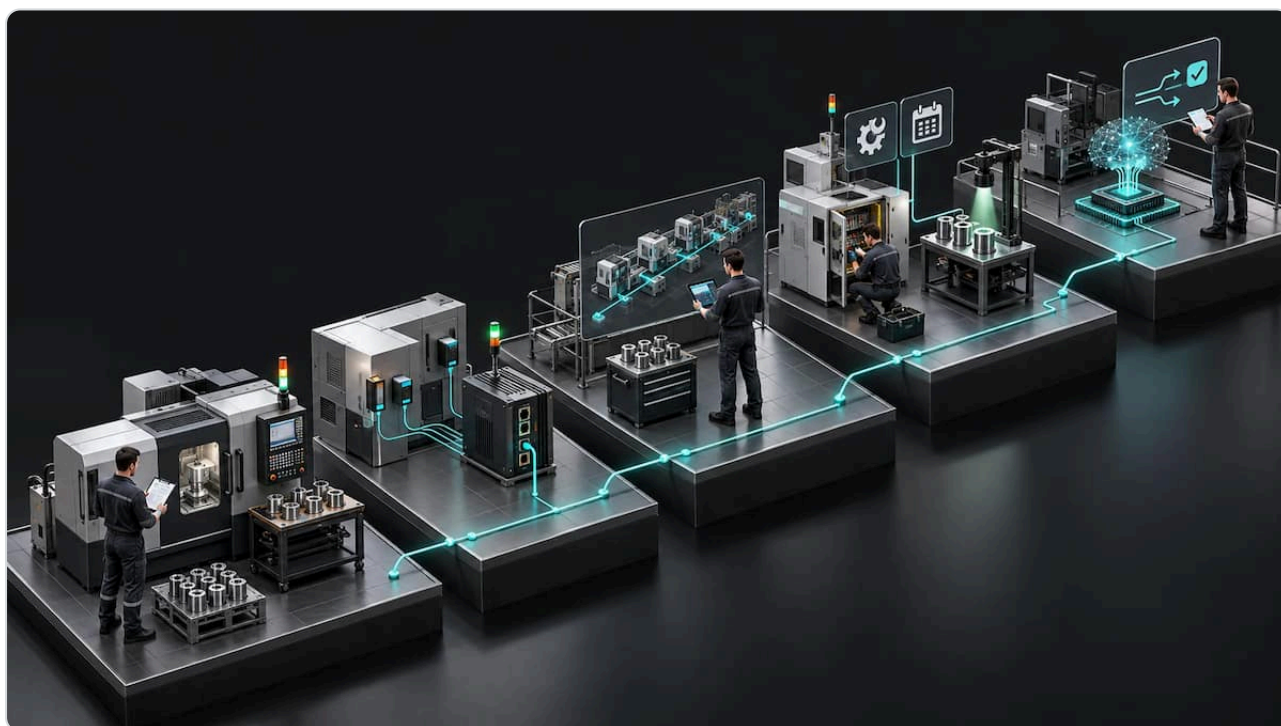


Figure 3. These stages are a suggested implementation framework; they are not a mandatory certification or a standard maturity model.

- 1. Define the process.** Map the workflow, losses, owners and measurement definitions. Do not select software before the process to be digitalized is understood.
- 2. Create reliable data.** Validate machine connectivity, master data and operator input. If data is missing or wrong, make that visible.

3. **Move from visibility to action.** Attach an owner, target time and outcome record to downtime and quality deviations.
4. **Integrate processes.** Reduce duplicate entries and gaps between ERP, quality, maintenance, warehouse and planning.
5. **Add optimization and AI.** Evaluate scenario analysis, forecasts and recommendations in a controlled way, based on reliable historical and current data.

At the end of each stage, ask: **Which decision is now made more accurately or more quickly, and which record proves it?** After the initial implementation, monthly improvement meetings and regular data quality checks should continue.

15. How is MES used together with AI?

MES provides the context of production events; AI can help search for relationships in this data, investigate deviations or generate decision recommendations. Reliable use of AI in manufacturing depends on issues such as data management, integration of different systems and explainability of results.⁶



Figure 4. Suggested starting point: analysis with limited access, evidence-based recommendations and human approval. AI output does not replace process safety controls.

Table 9

Use case	Data required	How is the result validated?
Production assistant	Authorized reports, KPI definitions, work order and downtime history	The answer's record, date range and calculation source are shown.
Downtime / quality anomaly analysis	Consistent time series, reason codes, product and mold context	The false alarm rate and events actually found are tracked.
Vision-based quality inspection	Labelled samples, suitable camera and lighting, quality decision	Missed defect and unnecessary rejection rates are measured separately.
Predictive maintenance	Breakdown history, sensor data, maintenance records	Failures detected in advance, false alerts and the benefit of actions are tracked.
Scheduling recommendation	Capacity, routings, due dates, materials and actuals	The recommendation is first tested in a scenario; the planner approves it.

Summarising a report in natural language may not require a large model training project. In contrast, reliable failure prediction requires sufficient event history and high-quality data. Having one in place does not mean the other is ready.

When starting with AI, read-only access, preserving data permissions and recording recommendations is a good approach. Changes that affect recipes, machine parameters or plans should be managed with approvals and safety limits. Both a local model and a cloud service can be options; hardware, usage volume, maintenance and total cost should be assessed together. **Running locally does not mean running at no cost.**

Is a 3D factory view the same as a digital twin?

No. A 3D view can present layout and status clearly. A digital twin, by contrast, is a model linked to its physical counterpart through data and validated for a specific purpose. If forecasting or simulation is to be performed, the model's validity and limits must also be demonstrated. A good-looking 3D model does not on its own count as a digital twin that produces accurate predictions. ⁷

16. What kind of demo should we ask for when selecting a vendor?

After the presentation, ask for scenarios using a few real examples from your own factory: normal production, a breakdown, a work order change, a wrong lot, a quality rejection and a connection outage. See how each step is recorded and how it is reflected in ERP.

Get written answers to the following questions before purchasing:

- ☐ Are the initial scope and out-of-scope work clear?
- ☐ Are the technical owners of the machine and ERP interfaces identified?
- ☐ Are hardware, installation, shop-floor network and travel included?
- ☐ Are user, machine, site, data volume and API limits defined?
- ☐ Who owns the records, and in what format will they be handed over at the end of the contract?
- ☐ Is the retention period for history, raw data and the audit trail defined?

- ☐ Will the operating scenario during internet and server outages be tested?
- ☐ How will version upgrades affect custom developments?
- ☐ To whom will shift training, support and system operation be handed over?
- ☐ Are success criteria, user acceptance and scope change fees defined?

Ask about the scope of phrases such as "unlimited license" too. Even if the number of users is unlimited, hardware, sites, integration, infrastructure and support items may be limited separately.

17. The OETECH approach: measurable progress that starts on the shop floor

In the MES and automation work we have been developing at OETECH since 2013, we treat production software together with shop-floor conditions. Different processes such as plastic injection molding, rubber, thermoforming and metalworking show that the same screen cannot be applied the same way in every company.

Our approach is built on first understanding the need and the data source, using existing automation where appropriate, adding data collection and operator interfaces where necessary, and then validating production, quality, maintenance and ERP flows together. Capabilities that can be addressed within IoE+ MES and ERP Core are scoped according to the needs of the facility; not every feature is assumed to be included in every project from the outset.

We care about evaluating a project less by its first screen and more by how it behaves during shift changeovers, missing materials, breakdowns, incorrect entries and connection outages. We also treat AI and 3D factory visualization as tools that can be added on top of this reliable foundation. The experience shared here is not a performance guarantee or a claim of customer results.

First step: answer three questions together

What do we want to improve? How do we measure it today? Which result will we validate in the first pilot?

Clear answers to these three questions are the foundation for choosing software, hardware and modules. With OETECH, you can assess your current production flow and initial pilot scope, and build a roadmap that fits your needs.

Sources and scope note

This content was prepared on 18 October 2026. The technical definitions and frameworks are supported by the sources below. Project schedules, the budget scenario, checklists and implementation recommendations are consulting frameworks prepared for this guide; they are not presented as standard

requirements or market research. The images are AI-generated conceptual illustrations; they do not depict a real facility, a validated technical architecture or customer performance.

1. [IBM — What is a manufacturing execution system \(MES\)?](#): MES definition and functional scope.
2. [MESA — Understanding Our Heritage](#): historical framework of MESA's founding and model development.
3. [ISA — ISA-95 Standard: Enterprise-Control System Integration](#): information exchange between business and manufacturing operations.
4. [Siemens — Manufacturing execution system software](#): production tracking, execution and traceability capabilities.
5. [NIST — SP 800-82 Rev. 3, Guide to Operational Technology Security](#): addressing performance, reliability and safety together in OT security. This guide is based on the final Rev. 3; Rev. 4 was in draft status at the time of writing.
6. [NIST — 2026 Roadmap on Artificial Intelligence and Machine Learning for Smart Manufacturing](#): AI, data and trustworthiness in manufacturing.
7. [NIST — Digital Twins for Advanced Manufacturing](#): digital twins, validation and limits of use.

Appendix A — Frequently asked questions

A.1 Do we need to replace our ERP system for MES?

Usually not. Integration can be designed by reviewing the existing ERP's interfaces, data model and scope of use. It should be determined which information is created in which system. If replacing the ERP is a separate need, the transition plan between the projects is prepared together.

A.2 Can we use MES without ERP?

Yes; you can start with a scope in which the required product, work order, routing and resource data is managed within MES or from another source. The data model and unique codes should be designed from the outset with future ERP integration in mind.

A.3 Is it suitable for small businesses too?

Suitability depends more on the problem to be solved than on the number of machines. A company with a clear bottleneck or traceability need can benefit from a small scope. If you cannot define the loss to be addressed and who will run the system, it is wiser to prepare first.

A.4 Can old machines or machines without a PLC be connected?

In many cases, basic information can be obtained with additional sensors or data acquisition hardware. However, which signal represents which production event must be validated during discovery. It should not be assumed that the same level of detail can be obtained from every machine.

A.5 Can manual labor and assembly operations be tracked?

Yes. Tracking can be set up with tablets/kiosks, barcodes, job start-end records, test equipment or suitable sensors. The design should not interrupt the operator's actual work with unnecessary data entry.

A.6 Is installation carried out by stopping production?

Not every task requires a stoppage. However, interventions such as work on control panels, signals or network connections may require planned downtime and authorized maintenance/automation staff. The installation plan should be prepared around the production schedule.

A.7 Does production stop if the internet goes down?

That depends on the architecture and which functions run locally. A properly designed edge or on-premises setup can keep some operations running. The behavior of recording, user sessions and ERP transactions during an outage should be clarified in writing at the offer stage.

A.8 How much historical data should we keep?

There is no single correct period. Customer expectations, contracts, industry requirements, analysis needs and storage costs are assessed together. Different retention policies can be applied to raw signals, production events, quality records and summary reports.

A.9 Does MES automatically ensure regulatory compliance or pass customer audits?

No. Record traceability and control steps can support compliance work, but buying software does not on its own ensure conformity. The record-keeping, validation and approval requirements of the relevant industry must be planned separately.

A.10 What happens if employees do not use the system?

Data becomes incomplete and confidence in the results drops. It is necessary to involve shift representatives in the design, use short screens, provide training and offer on-site support in the early period. Question an unused screen not only in terms of additional training, but also in terms of how well it fits the workflow.

A.11 Will MES push us to produce more?

The goal is production that matches orders, is of good quality and happens at the right time. Unnecessary production and increased work-in-progress are not success. Evaluate efficiency indicators together with the company's demand and bottlenecks.

A.12 Can we see costs for every cycle?

If the required consumption, time and rate data is available, a per-cycle operational cost calculation can be set up. Assumptions such as shared energy and labor allocations should be visible; the result should not be presented as final accounting cost.

A.13 Do we need to collect data for years before using AI?

Not for every use case. Question-and-answer based on authorized reports or rule-based explanations of deviations can start earlier. Applications such as failure and quality prediction, however, require suitable history, sufficient samples and shop-floor validation.

A.14 Should AI change work orders or machine parameters on its own?

The recommended model to start with is decision support and human approval. If automatic action is being considered, authority, limits, rollback, monitoring and process safety must be assessed separately. A language model is not a substitute for a safety PLC.

A.15 What are the most common reasons MES projects fail?

Unclear goals, constantly expanding scope, uncleaned master data, insufficient site discovery, failure to allocate internal team time and late definition of acceptance criteria are major risks. Making these visible at the start is more valuable than simply buying more features.

A.16 Will we lose our data if we change vendors?

To avoid losing it, data ownership, export formats, file attachments, history and migration support should be written into the contract. Having a PDF export of a report does not mean owning all your production records.

A.17 What should we prepare for the first meeting?

Prepare a machine list, a sample work order, a shift report, a basic process flow, ERP information and the three problems you struggle with most. Label samples, quality forms and connectivity options, if available, also speed up discovery. Not all data is expected to be perfect; it is enough for the gaps to be visible.



ABOUT THE AUTHOR

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ABOUT OETECH

Founded in 2013 and based in Bursa, OETECH Solutions develops software and hardware for production management, industrial data collection and automation. With IoE+ MES Cloud, HR+ Cloud PDKS and SoSo Inventory, it carries production data from the shop floor to decisions.

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