



MANUFACTURO®

MES MODERNIZATION

PLANNING KIT

MODERNIZATION STARTS WITH A PLAN

Aerospace and defense manufacturers are operating under more pressure than ever before: rising program complexity, stricter audit expectations, and increasing demands for traceability, efficiency, and performance.

But many enterprise systems — especially MES platforms — were built for a different era. They weren't designed to handle today's data, documentation, and compliance requirements at scale.

Modernization isn't a luxury. It's a business-critical move toward a more connected, compliant, and competitive future.

This planning kit is built for the teams doing the work — operations leaders, quality managers, system owners, and digital transformation champions — **who know change is needed and are ready to make it happen.**

Inside, you'll find a framework for evaluating your current systems, aligning stakeholders, and defining the right path forward — whether you're preparing for a phased deployment or looking to build your case for change.

Who this kit is for:

- OPERATIONS AND QUALITY MANAGERS READY TO LEAD CHANGE
- CROSS-FUNCTIONAL TEAMS EVALUATING THEIR NEXT-GENERATION MES
- LEADERS TASKED WITH IMPROVING COMPLIANCE, VISIBILITY, AND EXECUTION
- DIGITAL TRANSFORMATION CHAMPIONS BUILDING INTERNAL MOMENTUM

What's inside:

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MES MODERNIZATION ROADMAP

Successful MES modernization doesn't happen all at once — and it doesn't need to. The most effective transformations follow a phased roadmap that allows organizations to build alignment, reduce risk, and prove value early.

This roadmap outlines four key stages of a typical modernization journey. Use it to assess where your organization stands today — and to clarify what needs to happen next.

PHASE 1

ALIGN ON WHAT NEEDS TO CHANGE

- Get clear on what's working — and what isn't
- Identify pain points tied to compliance, quality, traceability, or cost
- Map existing systems and manual workarounds
- Begin sketching your modernization vision

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PHASE 2

GET STAKEHOLDERS ON THE SAME PAGE

- Identify internal champions across quality, operations, and IT
- Clarify what's important to each group (audit readiness, real-time visibility, etc.)
- Align on priorities, terminology, and timing
- Avoid misalignment that can stall implementation later

2

PHASE 3

FOCUS YOUR STARTING POINT

- Choose a process or line where problems are visible and improvement is measurable
- Define success metrics and system requirements
- Pilot something small that addresses real friction
- Build a foundation for scale — not a siloed solution

3

PHASE 4

BUILD MOMENTUM AND SCALE STRATEGICALLY

- Roll out improvements based on real user feedback
- Expand to additional teams, sites, or workflows
- Standardize what worked, adapt what didn't
- Use early wins to build internal buy-in and future investment

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STAKEHOLDER ALIGNMENT WORKSHEET: SET THE FOUNDATION FOR CHANGE

MES modernization isn't just an IT or operations project. It's a strategic shift that affects how people, processes, and systems work together across the enterprise. That's why alignment between stakeholders — especially early in the process — is critical to success.

Use this worksheet to identify who should be involved in planning and decision-making, understand their priorities, and map out the roles each stakeholder will play throughout the transformation process.

STEP 1 IDENTIFY KEY STAKEHOLDERS

Consider including representatives from:

- Operations leadership
- Quality and compliance teams
- Production supervisors
- Engineering and manufacturing systems leads
- IT and cybersecurity
- Program managers
- Finance and procurement
- Executive sponsors

STEP 2 MAP STAKEHOLDER PRIORITIES

Use this simple table to document and track what matters most to each group. Here are some starting examples:

STAKEHOLDER ROLE	PAIN POINTS	PRIORITIES	ROLE IN MODERNIZATION
Quality Manager	Manual data entry, audit prep overload	Automated traceability, compliance	Define compliance requirements
IT Director	Legacy integrations, security concerns	System scalability, cloud compliance	Oversee tech architecture
Ops Supervisor	Rework, disconnected work instructions	Process control, visibility	Provide workflow feedback

STEP 3 CLARIFY ROLES AND COMMUNICATION TOUCHPOINTS

For each stakeholder group, document:

- What they need to know
- When they need to be involved
- How best to engage them

QUICK TIP:

USE THIS WORKSHEET TO GUIDE AN INTERNAL ALIGNMENT SESSION. ASK EACH STAKEHOLDER TO REVIEW AND VALIDATE THEIR LINE IN THE TABLE, THEN REVISIT AND UPDATE IT REGULARLY THROUGHOUT THE PROJECT.

MES REQUIREMENTS BUILDER

Not all MES platforms are created equal.

This quick, focused exercise helps you define what your next system needs to support — based on the real-world challenges and workflows your team is managing today.

Check all boxes that apply, and any fields not listed below.

Part 1: Core Capabilities Checklist

- ☐ Digital work instructions for operators
- ☐ Serialized part and program-level traceability
- ☐ Built-in quality checks and signoffs
- ☐ Automated compliance logs and audit trails
- ☐ Real-time dashboards or alerts
- ☐ Role-based user access and version control
- ☐ Mobile/tablet accessibility on the floor
- ☐ Other: _____

Part 2: Integration & Infrastructure Priorities

- ☐ ERP integration (e.g., SAP, Oracle, Infor)
- ☐ PLM, QMS, or CAD system compatibility
- ☐ Cloud deployment preferred
- ☐ On-premise or hybrid support required
- ☐ Cybersecurity/ITAR compliance
- ☐ Support for multiple programs or sites
- ☐ Low-code/no-code configuration options
- ☐ Other: _____

Part 3: Top 5 User Needs

Fill out the section below for each user group and their needs. Frame each need as an action with purpose. This method ties the need to business outcomes, rather than potentially limiting it to a task context. Try this structure:

[Role] needs to [do something] so they can [achieve something].

EXAMPLE

A quality inspector needs to identify repeat NC trends by part number and shift so they can focus inspection efforts where risk is highest.

SAMPLE ROLE-NEED GRID

USER ROLE	WHAT THEY NEED FROM MES
Operator	Step-by-step work instructions, barcode scanning, rework visibility
Quality Inspector	NC disposition tools, checkpoints, historical trends
Production Coordinator	Real-time status, shift planning, WIP traceability
Engineer	Redline visibility, revision tracking, access to floor feedback
IT / Digital Lead	Integration flexibility, low-maintenance infrastructure

Your MES Requirements Builder

Use the space below to capture the top 2–3 needs for each key user group in your organization. Keep it simple and focus on what they need MES to do — not just what they do today.

USER GROUP	WHAT THEY NEED FROM MES
Operator	
Quality Inspector	
Production Coordinator	
Engineer	
Other (custom role)	

NEXT STEPS:

Consider which of these needs are non-negotiable vs. which ones are nice to have?



Bring this completed list into stakeholder alignment conversations or vendor evaluations.



I'd like to talk through our needs with a modernization advisor

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THE HIDDEN COSTS OF DOING NOTHING

Modernization might feel disruptive — but for enterprise aerospace and defense manufacturers, the bigger risk is often inertia. Every day spent with legacy systems adds up in ways that aren't always visible on the surface — through preventable rework, delayed deliveries, missed opportunities, and long hours spent chasing data across disconnected tools.

Below are six of the most common — and costly — consequences of standing still in a fast-moving industry.

The Cost of Doing Nothing: Legacy vs. Modern MES

COST CATEGORY	LEGACY SYSTEMS	MODERN MES
Scrap and Rework	\$1.2M annually (case example, but often more)	Reduced by 60% in first 6 months
Audit Preparation Time	100+ hours/month	Down to 10–12 hours/month
Missed Deliveries or Delays	20–30% program-level delivery delay risk	<5% with real-time prioritization and WIP tracking
Rework Investigations	Up to 3 days to complete root cause analysis	Completed in hours with smart RCA tools
Data Entry and System Navigation	6 FTEs (full-time equivalent) across quality & ops	Streamlined with role-specific interfaces and automation
Lost Contracts from Inadequate Traceability	Lost Tier-1 OEM contract (real scenario)	Contract won by proving audit-ready traceability in MES

Bottom Line:

Every month spent relying on outdated tools and disconnected systems increases risk, reduces responsiveness, and undermines your ability to compete. These are not hypothetical costs — they're real, recurring, and rising as complexity grows.

Fortunately, they're also preventable.

Modern MES platforms enable measurable improvements within weeks — often starting with a single process or line. By taking the first step, your team can begin shifting resources from reaction to strategy and start realizing the return on modernization earlier than expected.

NEXT:

LEARN HOW TO GUIDE YOUR TEAM THROUGH MODERNIZATION WITHOUT DISRUPTION.

MAKING MODERNIZATION STICK: THE ROLE OF CHANGE MANAGEMENT

Even the best MES strategy will stall without cross-functional buy-in and a realistic rollout plan. In enterprise aerospace and defense organizations, successful modernization isn't just about systems — it's about **people, processes, and mindset**.

That's where change management comes in.

Modernizing your MES means shifting the way work gets done — and that impacts everyone from operators and inspectors to engineering and executive teams. To gain momentum (and keep it), you'll need to go beyond technology decisions and **lead with intention**.

The following six steps can help you guide your organization through change — by reducing resistance, building trust, and showing progress early.

4. Start Small

Minimize risk and maximize learning

- ✓ Choose a visible, fixable process as a pilot to prove the value of change without major disruption.

3. Use Data to Overcome Resistance

Facts beat assumptions

- ✓ Show how much time is spent preparing audits or how many errors stem from tribal knowledge.

2. Speak to What People Care About

Tailor your message by role

- ✓ Operators want stability. IT wants simplicity. Executives want ROI. Frame benefits accordingly.

6. Build a Plan People Can Believe In

Create a shared, realistic roadmap

- ✓ Involve users in building the rollout. Show timelines, training, and how feedback will be addressed. Build on the wins and the excitement.

5. Share Success Early and Often

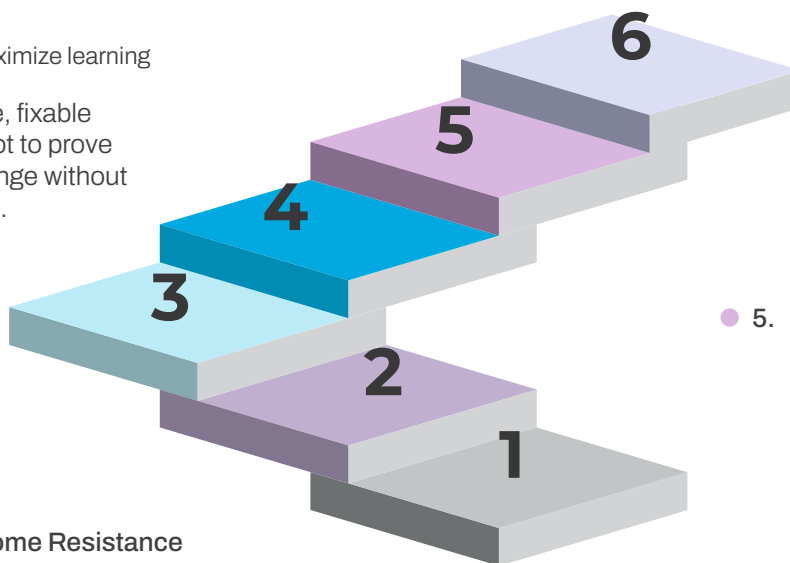
Build credibility through results

- ✓ Publicize early wins — rework reductions, faster RCA, smoother audits — across teams and leadership.

1. Don't Assume Alignment

Uncover hidden misalignment early

- ✓ Survey or interview stakeholders to surface conflicting goals or expectations.



Your Playbook in Action

These six plays are most effective when they're applied deliberately — not all at once. Use them to:

UNCOVER THE REAL REASONS
TEAMS RESIST MODERNIZATION

DESIGN YOUR PILOT PROJECT
AROUND EARLY CREDIBILITY

COMMUNICATE PROGRESS IN WAYS
THAT BUILD TRUST AND SUPPORT

CREATE A PHASED PLAN YOUR
ORGANIZATION CAN COMMIT TO

NEXT STEPS:

Use these steps as part of your stakeholder alignment meetings or rollout planning discussions. You can also incorporate them into internal presentations, kickoff decks, or training documentation to ensure everyone knows what to expect — and why it matters.

FROM PLANNING TO PROGRESS



You've done the hard part — now let's turn momentum into measurable results.

Whether you're just starting to explore MES modernization or already building internal alignment, this planning kit has helped you:

**IDENTIFY KEY GAPS IN TRACEABILITY,
QUALITY, AND VISIBILITY**



**CLARIFY STAKEHOLDER
ROLES AND REQUIREMENTS**



**MAP OPPORTUNITIES FOR EARLY
WINS**



**UNDERSTAND THE TRUE COST
OF STANDING STILL**

The next step doesn't require a full system overhaul — it just takes focus, alignment, and the right starting point.

Choose Your Next Step:

 Schedule a 30-Minute Modernization Planning Call	 Turn This Kit Into an Internal Plan
Work with a Manufacturo advisor to: ✓ Review your priorities and technical landscape ✓ Discuss phased rollout options for your environment ✓ See how other A&D manufacturers are approaching modernization	Need to bring others along? We can help you: ✓ Translate this kit into a stakeholder-ready presentation ✓ Tailor it to your company's goals and modernization timeline ✓ Share data-backed examples to help you build buy-in
Schedule a Strategy Session	Talk to an "Expert to Turn This Kit Into an Internal Plan"

Need Something Else?

We're here to help — whether you're evaluating tools, building a business case, or simply clarifying what “modern MES” looks like for your organization.

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