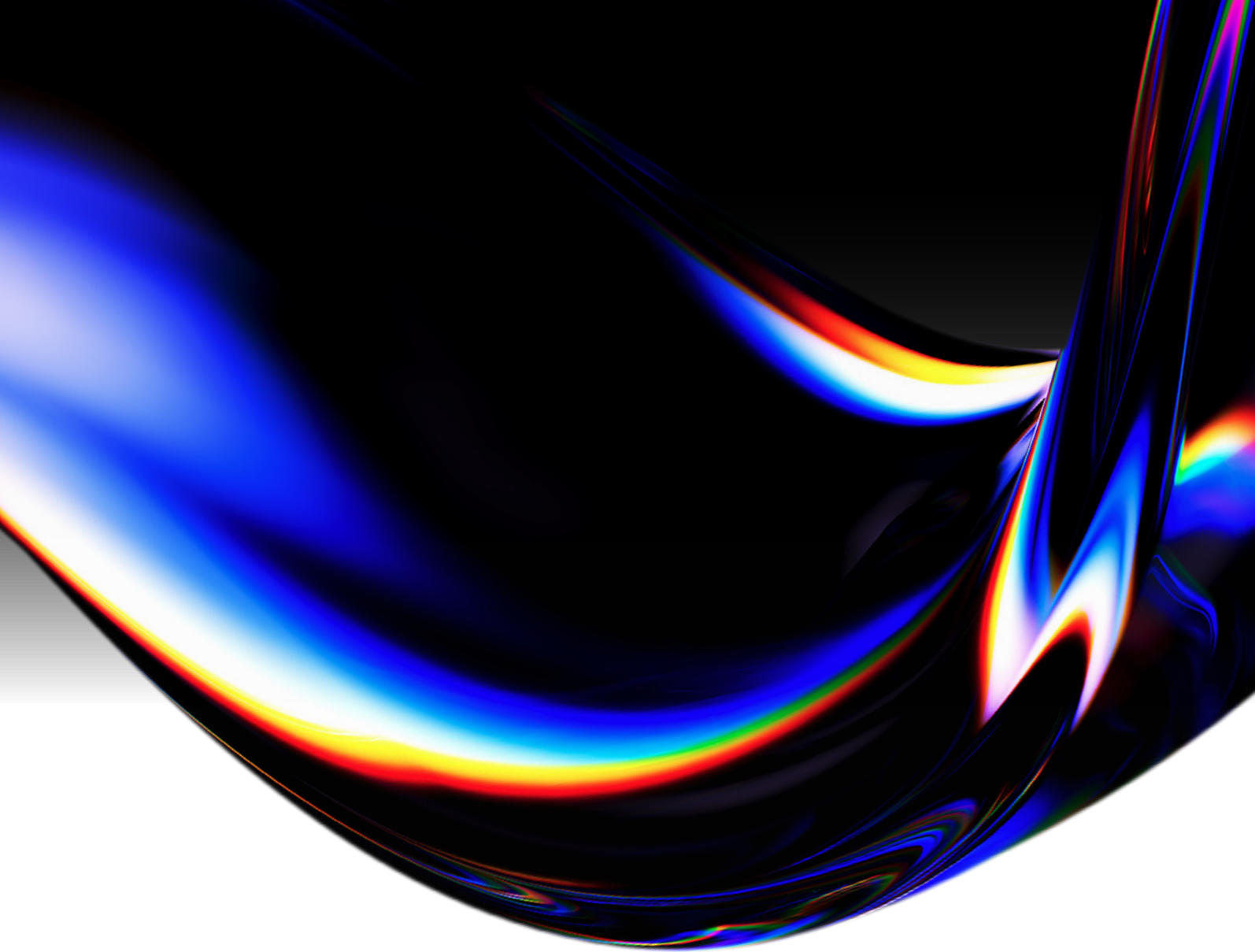




SAP modernization for manufacturers

What stays, what extends, what gets orchestrated

A practical guide to reducing SAP-adjacent process debt, protecting clean core, and orchestrating high-friction work around SAP

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Executive summary

For manufacturers, SAP modernization is no longer an ERP migration program, it is a process modernization and orchestration challenge. As they move towards S/4HANA, clean-core models and AI-enabled operations, they need a clear view of the workflows that sit around SAP today.

These workflows may involve plant exceptions, supplier issues, quality deviations, maintenance events, engineering changes, material and business partner master data, document approvals and AI-assisted decisions. They often cut across SAP, MES, QMS, SCADA, PLM, EAM/CMMS, planning systems, supplier portals, content repositories, analytics platforms and business users.

If these workflows are not addressed, organizations risk modernizing SAP without improving how work actually gets done. Critical processes remain fragmented across systems, reliant on manual coordination, difficult to monitor, and hard to govern at scale.

Point of view

SAP should remain the system of record for core transactions and master data. Process orchestration should manage the cross-system workflows, approvals, exceptions, documents, human decisions, AI-assisted actions and operating KPIs that surround the ERP core.

This guide offers a practical approach to:

1. Identify SAP-adjacent process debt and where it creates business friction.
2. Classify each workflow into one of four paths: keep in SAP, use SAP-native extension, retire/simplify, or orchestrate around SAP.
3. Prioritize one or two lighthouse use cases where business value is visible and implementation is feasible.
4. Build reusable orchestration patterns for approvals, exceptions, documents, case handling, monitoring, auditability and AI controls.





Why now: the modernization window is real

SAP states that mainstream maintenance for SAP Business Suite 7 core applications runs until the end of 2027, followed by optional extended maintenance until the end of 2030. This makes modernization planning a priority for organizations still running SAP ECC or heavily customized SAP landscapes.

But modernization doesn't automatically guarantee value realization. Gartner predicts that by 2027, more than 70% of recently implemented ERP initiatives will fail to fully meet their original business-case goals highlighting that technical go-live and business value are not the same thing.

For manufacturers, the timing matters because operational work does not wait for the end of a multi-year ERP roadmap. Supplier delays, quality deviations, production exceptions and maintenance issues continue today. A practical orchestration approach can reduce risk and deliver value before, during and after SAP migration.

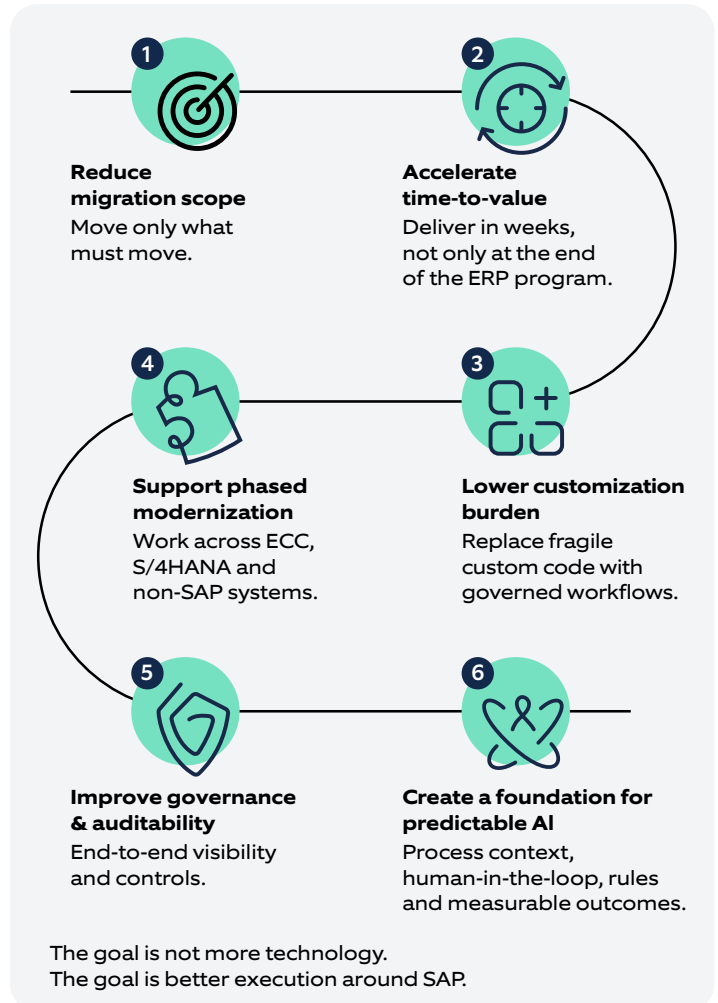


Figure 1: Why process orchestration matters during SAP modernization

Market trigger	What it means for manufacturing leaders
SAP 2027/2030 timeline	Modernization decisions need to be made with a clear view of process scope, custom workflows and operational risk.
Clean-core agenda	Standardize what belongs in SAP; avoid rebuilding every exception and local variant in the new core.
ERP value-risk	Treat value realization as a process execution challenge, not only a migration milestone.
AI adoption	Embed AI into governed workflows with rules, human review, audit trails and KPIs.



What SAP-adjacent process debt looks like in manufacturing

Process debt is the accumulation of workflows, approvals, custom logic, manual handoffs, spreadsheets, shadow applications, local variants and integrations that sit around the ERP core. It is often created with good intent. A plant needs a workaround. A supplier process needs speed. A compliance team needs an approval trail. A business unit needs a custom field, form or report. Over time, these additions become difficult to govern and expensive to modernize.

Practical test

If a process lives across SAP, MES, QMS, PLM, SCADA, EAM/CMMS, supplier portals and email, it is unlikely to be solved by ERP migration alone.

Manufacturing area	Typical process debt pattern
Supplier collaboration	Supplier onboarding, supplier data changes, quality documentation, compliance checks and external communication outside governed workflows.
Quality	Quality deviations, NCR/CAPA, inspection follow-ups, audit evidence and supplier corrective actions spread across QMS, SAP, email and documents.
Maintenance	SCADA alerts, work orders, planner coordination, spare-parts readiness and maintenance approvals that require manual follow-up.
Engineering change	PLM-to-SAP handoffs, BOM impact, supplier readiness, production cutover, quality sign-offs and local plant variants.
Master data	Material, vendor, customer and business partner updates handled through email, spreadsheets or loosely governed approvals.
AI initiatives	AI recommendations or copilots operating outside approved workflows, with unclear ownership, evidence, approval path or measurable outcome.



Where process orchestration helps across the SAP journey

Process orchestration is not only a post-go-live optimization lever. It can help before migration starts, during design, mid-flight and after go-live. The practical value comes from managing work in increments while the broader SAP roadmap progresses.

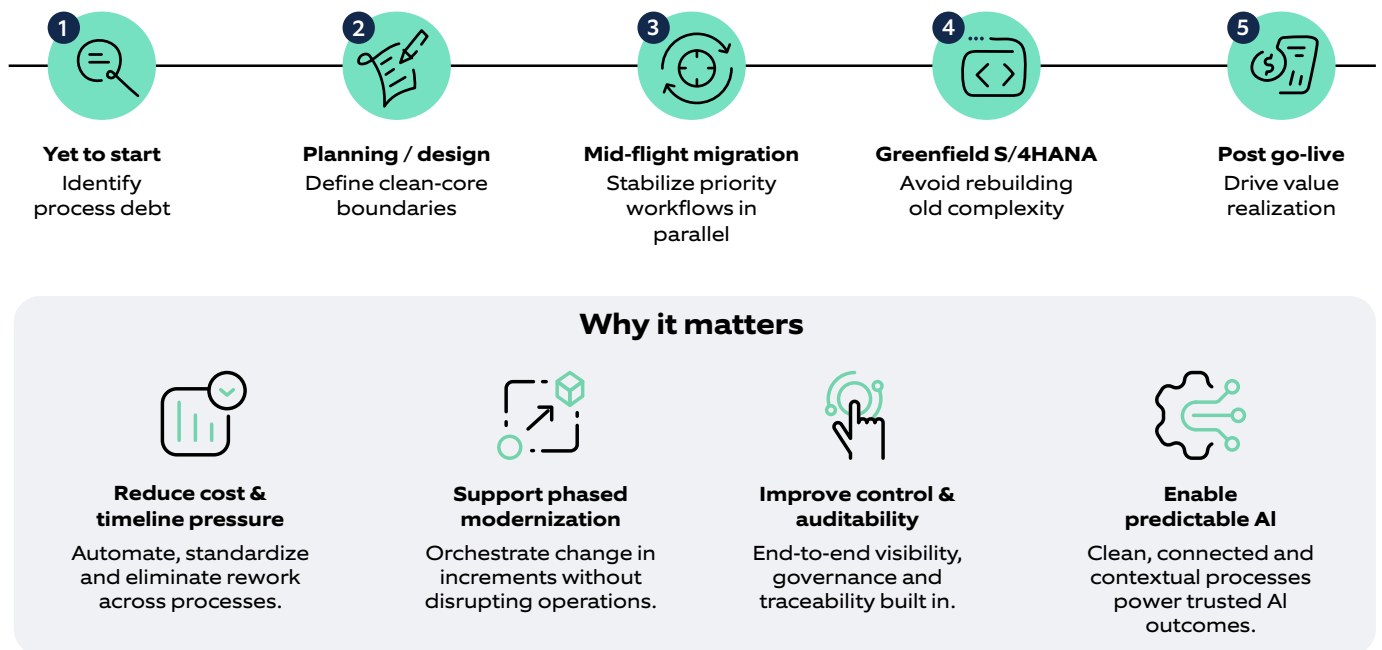


Figure 2: How process orchestration helps across the SAP modernization journey.

SAP journey stage	What to do practically
Yet to start	Inventory SAP-adjacent workflows and identify process debt before migration scope is locked.
Planning / design	Define clean-core boundaries and classify workflows into SAP standard, SAP-native extension, retirement or orchestration.
Mid-flight migration	Stabilize priority workflows in parallel to reduce business pressure and avoid uncontrolled scope expansion.
Greenfield S/4HANA	Avoid rebuilding old complexity in a new core. Orchestrate exception-heavy and external-stakeholder workflows around SAP.
Brownfield / selective transformation	Classify ABAP logic, custom workflows and local variants. Retire low-value items and externalize cross-system process logic where appropriate.
Post go-live	Close the gap between technical go-live and business value through visibility, KPI measurement, exception handling and continuous optimization.



How to build an SAP modernization strategy?

A credible SAP modernization strategy needs clear architectural decisioning. The risk is two-sided: rebuilding every business-specific workflow inside SAP can dilute the clean core, while externalizing too much can create another fragmented layer outside SAP.

The right answer depends on process fit, data ownership, stakeholder participation, change frequency, integration complexity and governance needs.

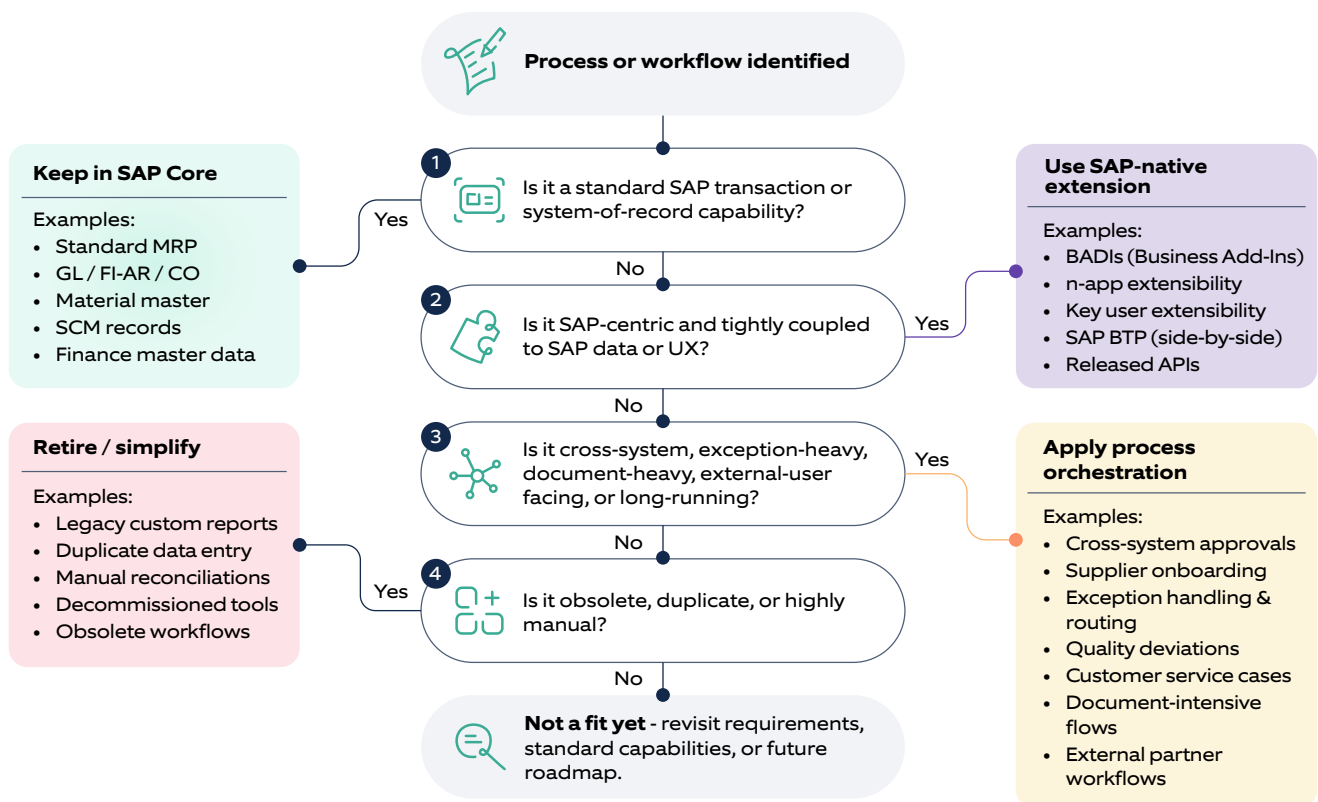


Figure 3: What stays in SAP, what extends SAP, what gets orchestrated, and what should be retired or simplified

Decision path	Use when	Manufacturing examples
Keep in SAP core	The capability is a standard SAP transaction or system-of-record function.	MRP, standard procurement, finance records, material master, inventory records.
Use SAP-native extension	The requirement is SAP-centric and tightly coupled to SAP data, SAP UX, released APIs or SAP extension mechanisms.	SAP-centric validation, in-app extensibility, Fiori-based process steps, BADIs/user exits where appropriate.
Retire / simplify	The workflow is obsolete, duplicate, low-value, highly manual or not business-critical.	Legacy custom reports, duplicate trackers, manual reconciliations, local workflows no longer needed.
Apply process orchestration	The workflow is cross-system, long-running, exception-heavy, document-heavy, external-facing or AI-assisted.	Supplier onboarding, quality deviations, maintenance coordination, engineering change, AI-assisted triage.



SAP BTP and process orchestration: complementary, not competing

SAP-native extension and broader process orchestration should not be positioned as rivals. SAP BTP and SAP-native extension are highly relevant for SAP-centric innovation, side-by-side applications, integration services, user experiences and clean-core aligned extensibility.

The question is not whether SAP-native extensions work. It is whether the process lives within SAP or extends across the enterprise.

Balanced position

Use SAP for what SAP is best at: core transactions, authoritative data and SAP-centric innovation. Use process orchestration for complex work that cuts across systems, functions, documents, exceptions and human decisions.

Scenario	Likely direction	Reason
SAP-centric workflow	SAP-native extension / SAP BTP may be the right fit	The process stays close to SAP data, SAP roles and SAP transaction context.
Cross-system workflow	Process orchestration may be required	The process spans SAP and non-SAP systems, people, documents and external stakeholders.
Long-running case	Process orchestration may be required	The process needs state management, SLA, exception handling and audit across multiple steps.
External user workflow	Process orchestration may be required	Suppliers, customers, regulators or partners participate without full SAP access.
AI-assisted execution	Process orchestration may be required	AI recommendations need process context, human review, rules, controls and traceability.



Where manufacturers should look first

The best place to start is a process that is visible, painful, cross-system, and easy to measure, with a scope small enough to prove value quickly. The following are common candidates in SAP-heavy manufacturing environments.

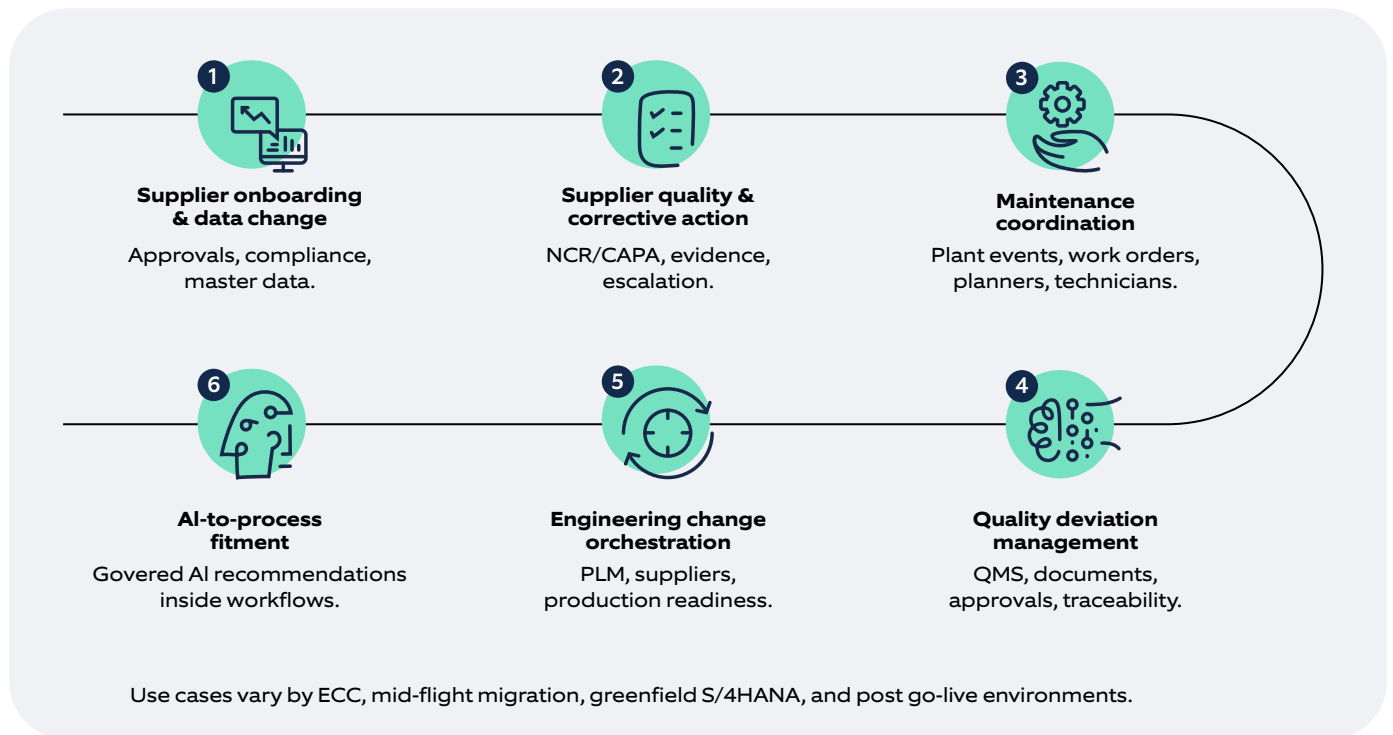


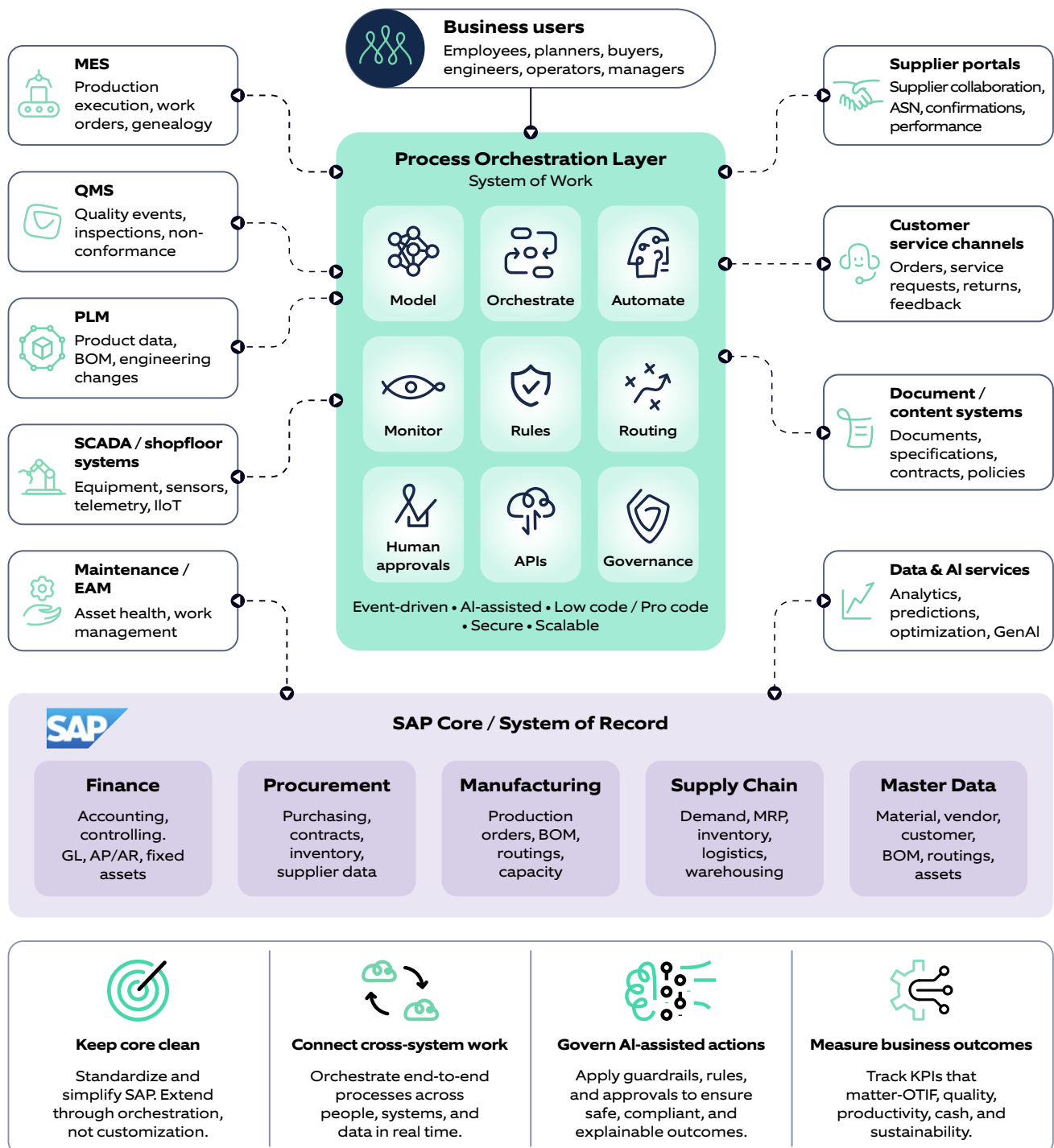
Figure 4: High-probability manufacturing use cases for SAP-adjacent orchestration

Lighthouse use case	Why it matters	Typical systems / stakeholders
Supplier onboarding and data change	Reduces manual onboarding, duplicate entry, approval delays and compliance gaps.	SAP, supplier portal, procurement, quality, compliance, document repository.
Supplier quality and corrective action	Coordinates defects, evidence, escalation, supplier response and closure.	QMS, SAP, supplier systems, quality teams, procurement.
Quality deviation / NCR / CAPA	Connects plant issue, quality review, corrective action, audit evidence and SAP updates.	MES, QMS, SAP, suppliers, document systems, quality teams.
Maintenance coordination	Convert plant events into governed work orders, prioritization, spares readiness and closure.	SCADA, EAM/CMMS, SAP PM, planners, maintenance, inventory.
Engineering change orchestration	Coordinates PLM-to-SAP impact, production readiness, supplier readiness and plant rollout.	PLM, SAP, MES, QMS, suppliers, engineering, operations.
AI-to-process fitment	Embeds AI recommendations into governed workflows with human review and measurable outcomes.	SAP, data platform, AI services, process orchestration, audit logs.



Reference architecture: connected execution around SAP

A clean-core aligned orchestration architecture keeps authoritative data and core transactions in SAP, uses SAP-native extension where appropriate, and orchestrates cross-system workflows around the core. The architecture should make work visible, assignable, measurable and governable without duplicating master data or bypassing SAP controls.





Reference architecture: connected execution around SAP

Architecture layer	Role in the model
SAP core / system of record	Owns authoritative transactions and master data across finance, procurement, manufacturing, supply chain and master data.
SAP-native extension / integration services	Supports SAP-centric extensions, APIs, events, Fiori experiences and integration patterns where relevant.
Process orchestration layer	Models, orchestrates, automates, monitors and governs cross-system work across people, systems, rules, tasks and decisions.
Manufacturing systems	MES, QMS, PLM, SCADA, EAM/CMMS, supplier portals, service systems, content repositories and AI/data services.
Business users and external stakeholders	Employees, planners, operators, engineers, buyers, suppliers, customers, regulators and partners.

Architecture guardrail

The orchestration layer should coordinate work, decisions, exceptions and visibility. It should not duplicate SAP master data or become a second system of record.



Predictable AI needs governed workflows

AI cannot generate value if it sits outside the processes. A standalone copilot may summarize a case, classify a document or recommend an action.

But business value depends on what comes after: who reviews, which data is used, which rule applies, what evidence is captured, where SAP is updated and how the outcome is measured.

AI principle

Predictable AI requires process context, governed data access, business rules, human-in-the-loop control, exception handling, audit trails, monitoring and measurable KPIs.

AI use case	What orchestration must govern
Quality deviation triage	Route to quality owner, retrieve plant and supplier data, capture evidence, apply severity rules, update closure status.
Maintenance prioritization	Combine plant signals, asset criticality, spare-parts readiness and planner approval before triggering work.
Supplier risk recommendation	Route supplier risk signals into procurement, quality and compliance workflows with documented decisioning.
Document classification	Validate extracted data, request human review, create audit trail and update SAP only through approved paths.
Invoice exception handling	Use AI to classify discrepancy, but route commercial approval, vendor communication and posting through governed workflow.



Readiness self-check: is process debt slowing your SAP modernization?

Score each statement from 1 to 5: **1 = not true / low risk**; **5 = very true / high risk**. The score is indicative and should be followed by detailed assessment if the result is moderate or high.

#	Diagnostic statement	Score 1-5
1	We have custom SAP or ABAP workflows that are difficult to understand, test or migrate.	
2	Approvals often happen through email, spreadsheets, shared drives or local trackers.	
3	Business users need SAP data but do not need full SAP access.	
4	Important processes cross SAP and non-SAP systems such as PLM, MES, QMS, CRM, service or supplier portals.	
5	External suppliers, customers, partners or regulators participate in workflows that touch SAP data.	
6	We have legacy workflow tools, SharePoint workflows, local plant applications or shadow IT around SAP.	
7	Exception handling is manual, poorly visible or difficult to audit.	
8	We do not have a clear decision framework for what stays in SAP versus what should be orchestrated.	
9	We cannot consistently measure cycle time, rework, exception volume, SLA breach or value leakage.	
10	AI use cases are being explored, but they are not embedded into governed processes with human review and auditability.	

Total score	Interpretation	Suggested next step
10-20	Low visible process debt	Start with targeted optimization and keep monitoring migration impact.
21-35	Moderate process debt	Run a focused discovery and prioritize one or two SAP-adjacent workflows.
36-50	High process debt	Conduct a SAP-adjacent workflow modernization assessment and define a lighthouse use case.



Lighthouse use-case prioritization canvas

Use this canvas to select the first orchestration use case. The aim is to identify a workflow that is important enough to matter but bounded enough to prove value quickly.

Question	Why it matters	Notes
What is the current pain?	Clarifies whether the issue is delay, rework, audit risk, cost, poor experience, lack of visibility or all of these.	
Which systems and stakeholders are involved?	Reveals whether this is truly SAP-centric or cross-system and multi-party.	
What is the measurable outcome?	Prevents the initiative from becoming generic automation without business value.	
What data is authoritative and where?	Protects SAP data ownership and reduces duplication risk.	
What decisions, rules and approvals are involved?	Defines workflow logic, human review and governance requirements.	
What exceptions occur most often?	Identifies the real work that breaks outside the happy path.	
What can be piloted in 8-12 weeks?	Keeps the first use case practical and measurable.	

A practical 30 / 60 / 90-day action plan

Start with a short discovery, select one lighthouse use case, build a measurable pilot and scale only when value is visible.

Timeframe	Focus	Suggested next step	Outputs
Days 0-30	Discover and classify	Run stakeholder interviews, review process pain points, inventory workflows, classify what stays/extends/retires/orchestrates.	Process-debt heatmap, candidate workflow list, clean-core decision view.
Days 31-60	Design lighthouse use case	Select one use case, define target process, ownership, data, integrations, approvals, exceptions, controls and KPIs.	Lighthouse blueprint, solution architecture, backlog, success metrics.
Days 61-90	Pilot and prove value	Build a thin-slice workflow, integrate with key systems, test with users, measure cycle time, exceptions, visibility and adoption.	Pilot demo, value readout, scaling roadmap, reusable orchestration patterns.



How Nagarro helps

Nagarro helps manufacturing enterprises move from SAP modernization intent to orchestrated execution. We combine SAP expertise, manufacturing context, iBPM capability, integration thinking, quality engineering and AI-first delivery to help clients modernize work around SAP without weakening the ERP core.

Nagarro is an SAP Gold Partner. That matters because SAP-adjacent orchestration should be designed with SAP understanding, not as a workaround that bypasses SAP standards or governance.

Offering	What it delivers
SAP-adjacent workflow debt discovery	Identify custom workflows, ABAP logic, manual approvals, local variants, shadow applications and process gaps around SAP.
Clean-core decision workshop	Classify workflows into SAP standard, SAP-native extension, retirement/simplification or process orchestration.
Lighthouse use-case design	Select one measurable workflow such as supplier onboarding, quality deviation, maintenance coordination or master data approvals.
Process orchestration implementation	Design, integrate and deliver cross-system workflow orchestration across SAP and non-SAP systems.
AI-to-process fitment	Embed AI recommendations into governed workflows with rules, approvals, exception paths and auditability.
Scale and run	Build reusable patterns, governance, KPIs, operating model and managed enhancement capability.





Design guardrails: what not to do

Process orchestration should not become another layer of uncontrolled complexity. Use the following guardrails to keep the model practical, secure and aligned.

- **Do not externalize standard SAP transactions unnecessarily.** If the process is standard and stable, keep it in SAP.
- **Do not duplicate master data without a clear reason.** SAP or approved master-data systems should remain authoritative.
- **Do not rebuild inefficient legacy workflows as-is.** Simplify before you orchestrate.
- **Do not bypass SAP governance or security.** Respect role-based access, segregation of duties, GRC and enterprise architecture.
- **Do not run AI outside process controls.** AI needs process context, human review, logging and outcome measurement.
- **Do not use orchestration to avoid hard simplification decisions.** The purpose is to reduce process debt, not preserve it in a new layer.



Source notes and validation references

- SAP maintenance strategy for SAP Business Suite 7 and SAP S/4HANA: <https://support.sap.com/en/release-upgrade-maintenance/maintenance-information/maintenance-strategy/s4hana-business-suite7.html>
- Gartner ERP initiatives insight: ERP value realization risk: <https://www.gartner.com/en/information-technology/insights/what-it-leaders-must-do-to-avoid-disappointing-erp-initiatives>
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Leads the iBPM Practice at Nagarro, focusing on process orchestration, intelligent automation, process intelligence, and AI-enabled business transformation. With 15+ years of experience across practice building, partnerships, presales, delivery, and go-to-market strategy, he helps enterprises modernize complex workflows across systems, functions, and business operations. His current focus includes SAP-adjacent process orchestration, clean-core aligned modernization, and scalable automation models that help organizations improve execution, governance, and business outcomes.