



INDUSTRY SOLUTIONS

Operational AI for Manufacturing

A guide to the recurring work around the plant, and the AI roles that can take it on.



A practical reference for operations leaders deciding where AI is worth building and where it is not.

6

representative AI
roles mapped

45 min

AI Workforce Review
to find the first role

50

open-source workflow
patterns published

RECURRING WORK · AI ROLES · SYSTEMS · OVERSIGHT · VALUE CASE · FIRST ROLE



Start with **the recurring work**, not the technology.

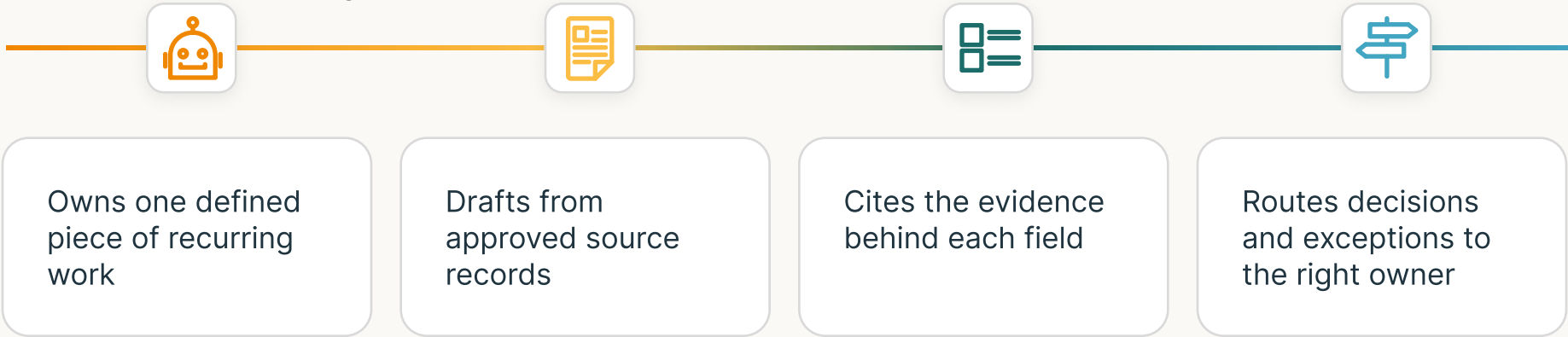
On most plants, the line stops before the machine does. A work order is held, a quality packet is missing evidence, or a supplier date moves, and the answer sits across several systems. When the handoffs depend on someone chasing it, a shift is gone before anyone decides.

Four recurring patterns appear across manufacturing operations:

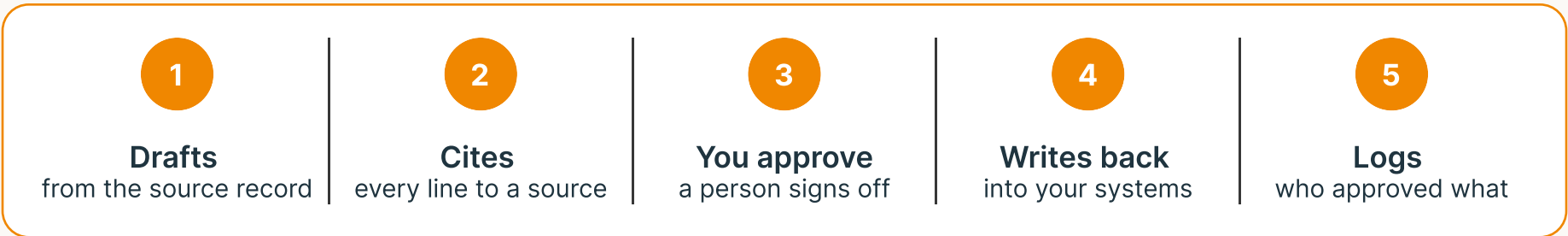
Blocked work orders that become planning crises A material shortage or missing document holds a work order, and the planner spends the shift assembling the facts before any recovery plan exists.	Quality review spent gathering evidence Deviation records, inspection data, and supplier certificates are scattered, so specialists spend review time collecting the packet instead of judging it.
Supplier date changes that arrive too late Confirmations live in email and portals. By the time a slipped date reaches the plan, the window to re-sequence has closed.	Engineering revisions that expose open orders A new revision is released, and nobody can quickly say which open work orders, lots, or purchase lines are still building the old one.

How an AI role responds

The work keeps moving while accountable people remain in control.



Every Metacto AI role follows the same operating loop.





What an AI role in manufacturing **actually** does.

Illustrative example: a blocked work order cleared before the shift is lost

ANATOMY OF AN AI ROLE

line blocker desk ai role · wo 5521

✓ SYSTEM OF RECORD

✓ EVERY LINE CITED

1

TRIGGER

Work order hold · ERP · 10/14 · WO 5521

Line 2 held. Bracket subassembly short 140 units.

No recovery plan. Second shift starts at 3 o'clock.

2

Block brief B-209 · WO 5521 recovery

1 SHIFT AT RISK

LINE BLOCKER DESK

Shortage · bracket 7731, 140 units

Alternate lot · L-2290, 60 units

Resequence · WO 5534 forward

cited: MRP shortage report, PO 88412 line 3

cited: lot inspection record, QA hold release

cited: production schedule wk 42, routing 7731

ETA 10/16

60 avail.

+0 days

Shift recovered if approved

1 shift

3

PLANNER DECISION

Approve

awaiting planner

edit · override · reject, all logged

4

WRITE-BACK

written back

WO 5521 resequenced · WO 5534 moved forward · approved by your planner · timestamped

!

EXCEPTION

Supplier date unconfirmed? The brief is held, and the question goes to the supplier and your buyer.

✓ HUMAN IN THE LOOP

✓ ASKS, NEVER GUESSES

✓ MEASURED TO A BASELINE

Success metric: Blocked work orders cleared before a shift is lost.



The same standard, across the work that runs the plant.

Each AI role is deliberately narrow: it owns one repeated piece of work, uses approved records, cites its sources, and routes decisions to an accountable owner.

Line Blocker Desk AI Role	Assembles each blocked work order and routes it to the owner who can clear it.	WO 5521 · brief ready	Blocker age
Quality Packet Builder AI Role	Compiles deviation evidence into a complete packet for specialist review.	D-077 · 2 records missing	Packet prep time
Supplier Promise Chaser AI Role	Confirms unconfirmed purchase-line dates with suppliers and flags changes.	9 lines unconfirmed	Confirmation latency
Maintenance Job Prep AI Role	Gets parts, history, and instructions ready before the maintenance window.	Asset P-14 · ready	Ready-work backlog
Change Effectivity AI Role	Finds open orders, lots, and purchase lines exposed to a new revision.	Rev C · 6 orders exposed	Exposed work at release
Promise Risk Watch AI Role	Flags customer orders with schedule conflicts while there is time to act.	SO 30219 · at risk	Promise-risk age

Any work that recurs across orders and shifts and carries real cost in throughput, quality, or customer promises may be a candidate. Before funding a build, evaluate it against the Five Conditions of a Fundable AI Workflow:

THE FIVE CONDITIONS OF A FUNDABLE AI WORKFLOW

Business impact	Workflow repeatability	Source readiness	Decision ownership	Implementation path
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Do not automate everything at once. Start with one AI role that has a credible baseline, a clear owner, and a measurable outcome.



AI roles work **inside the systems** you already run.

An AI role should not create another destination for your team. It reads and writes at the record level inside approved systems, using role-based access, explicit approval gates, and controlled write-back.

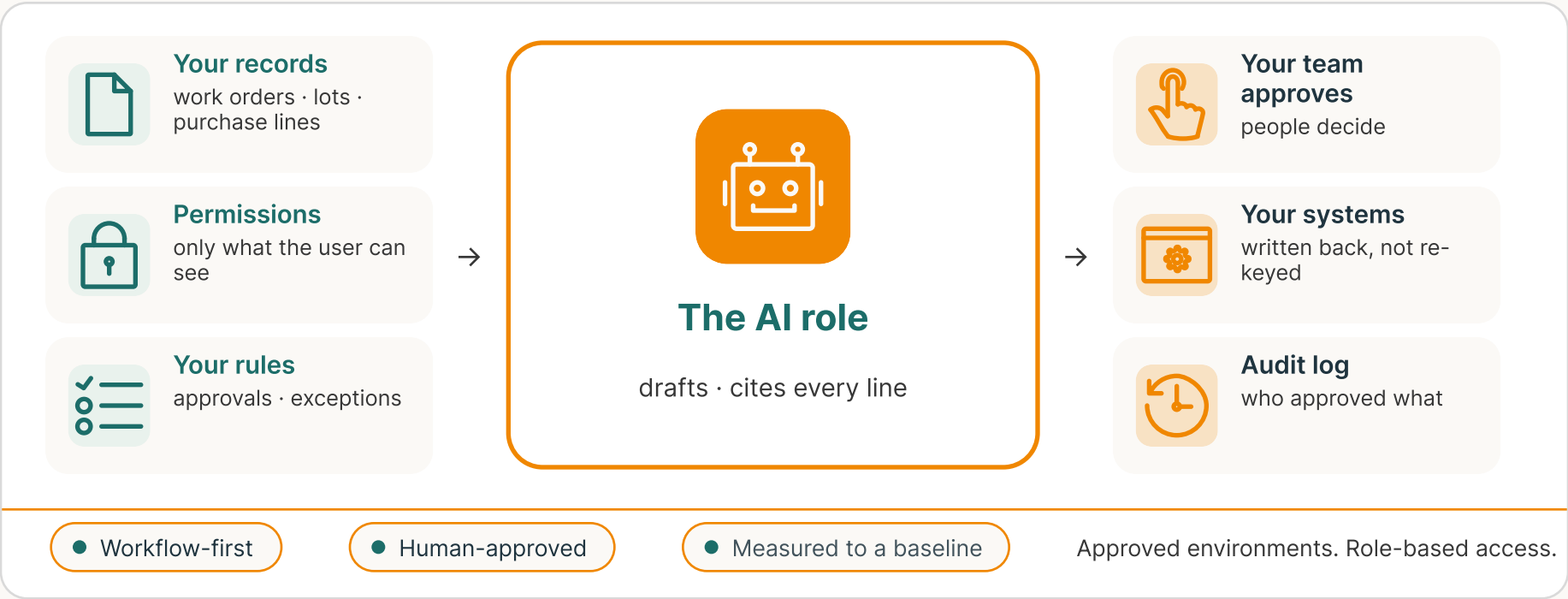
Common system categories

PLANNING & PRODUCTION	QUALITY, ENGINEERING & MAINTENANCE	DOCUMENTS & DATA
ERP work orders, BOMs, purchase lines	QMS deviations, NCRs, CAPAs	Document control SOPs, work instructions
MES holds, operations, labor	PLM revisions, ECOs, drawings	Data warehouse plant and quality data
Scheduling sequence, capacity	CMMS asset work, PM history	Shared drives specs, inspection records
WMS lots, locations, transfers	Supplier portal confirmations, certificates	

Categories only. The specific systems, access, and write-back path are confirmed during the AI Workforce Review.

Governance & risk controls

Production AI requires explicit boundaries: what the system may read, what it may draft, who must approve, where the result is written, and how every action is recorded.





Establish **value** before you build.

The business case should begin with the workflow baseline, not a generic estimate of AI ROI.

Value shows up at the workflow level

Each workflow targets a specific operational lever: speed, quality, margin, or risk control.

PRODUCTION BLOCKS	Shifts recovered before they are lost.
QUALITY	Packets arrive complete for review.
SUPPLIERS	Date changes caught while there is time to act.
MAINTENANCE	Work ready before the window opens.
ENGINEERING CHANGES	Open orders protected from old revisions.

The stakes are concrete, per event

In the illustrative example, brief B-209 puts a 140-unit shortage, a 60-unit alternate lot, and a resequencing option in front of the planner before second shift starts. The question is not whether AI can summarize a hold. It is whether the shift is saved.

How the value case is built

In the AI Workforce Review and Launch & Prove, Metacto baselines the selected work using measures such as block age, packet preparation time, confirmation latency, ready-work backlog, and correction cycles. That baseline supports a build-or-no-build decision before implementation budget is committed, and it stays in place after launch.

A credible production workflow has to work for each stakeholder.

 Owner / CFO: Measurable economics An explicit baseline, value model, and measurement plan before investment.	 CEO / COO: Operational leverage More output from the same lines, earlier visibility into supply and promise risk, and fewer expedites.
 Planning / Quality / Maintenance: Process control Clear ownership, review gates, and exception handling without removing people from accountable decisions.	 IT / Security: Access & governance Role-based access, source citations, audit logs, and controlled write-back into existing systems.



Proof gets built on your work, not borrowed.

There is no borrowed case study here. Every AI role Metacto builds is proven on your own work: a baseline is set first, the role runs behind your review queue, and it scales only when the numbers hold. This is how that looks for a first role.

The test is simple: the first role beats its baseline inside your review queue, or it does not scale.

FIRST ROLE	FUNCTION	MEASURED AGAINST	PRIMARY USERS
Line Blocker Desk AI Role	Work-order holds and recovery planning	Blocker age and schedule recovery time	Planners, supervisors, and purchasing

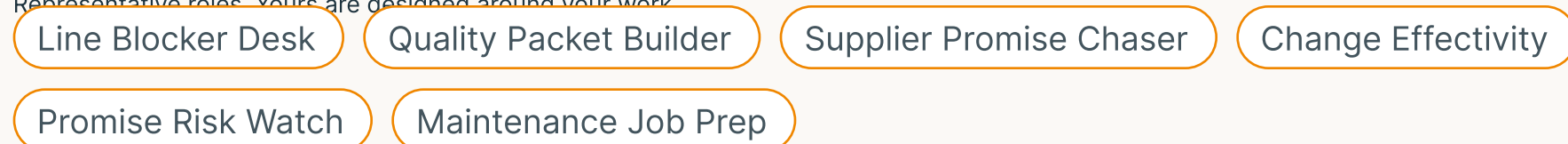
The starting queue

Most plants already know where the queue is: held work orders. A hold posts, and the planner chases purchasing, quality, and the floor to find out why and what can move. That is the work the first role takes on.

The roles mapped around it

Around that first role, six AI roles are mapped across production blocks, quality, suppliers, maintenance, engineering changes, and customer promises. Each one is representative; yours are designed around your plant.

Representative roles. Yours are designed around your work.



What gets measured

Baseline	01	02	03
set before the build and kept after launch, measured across three tracks	Speed Block age and confirmation latency, measured from hold to release	Quality Packets returned incomplete and correction cycles	Capacity Planner, quality, and buyer hours recovered from chasing

No results are claimed here. Each track is measured on your own baseline during Launch & Prove.



What you can check before you buy.

Open by default

Metactio publishes 50 workflow patterns through Vociion, its open-source platform, so your team can read how an AI role is built before committing to one. Roles run in your own environment. If you stop the service, you keep the workforce: deployed roles stay yours on their last deployed version.

What every AI role ships with

Eleven standards, built into every role from day one:

- | | |
|---|---|
|  Named human owner |  Defined scope of work |
|  Source citations |  Approval gates |
|  Exception routing |  Role-based access |
|  Write-back to your systems |  Audit trail |
|  Baseline and success metric |  Cost and usage tracking |
|  Monthly value review | |

Oversight by design

01 Citations

Every claim and number ties back to a source your reviewers can check.

02 Review Gates

External actions are held for human approval; the system stages drafts and recommends next steps.

03 Audit Trail

Activity is actor-attributed and traceable: what AI suggested, what a human approved, and what moved.

04 Utilization & Cost

Usage is tracked by role, workflow, and surface, providing visibility into adoption, value, and operating cost.



Start with the first AI role **worth funding.**

AI in manufacturing should begin with one repeated queue the plant already complains about, where throughput or a customer promise still depends on chasing information. Pick the queue with the clearest economics, build the role around your real process, and expand from measured results.

What a first build has to answer

01

Where is value leaking?
Identify the holds, packets, and handoffs where shifts, quality time, or customer dates are repeatedly lost.

02

Which work is most fundable?
Select the candidate with the strongest combination of business impact, repeatability, source readiness, decision ownership, and implementation path.

03

What context and controls does it require?
Define the records, systems, permissions, rules, approvals, and exception paths required for reliable operation.

04

How will value be measured?
Establish the baseline, success metric, and value model that will determine whether the build is worth funding.

Estimate the opportunity with your own numbers

Use a small set of operating inputs to create a preliminary annual estimate. Metacto validates the assumptions against your actual baseline during the AI Workforce Review.

Annual opportunity = blocked orders × cost of delay × recoverable share + planner value

BLOCKED ORDERS · YOUR INPUTS	
Blocked work orders per year (across lines)	—
Average cost of delay (\$ per blocked order)	\$ —
Recoverable share (vs. your baseline)	— %
Planner capacity value (recovered hours × loaded cost)	—
Illustrative gross annual opportunity (\$)	—

WORKED EXAMPLE		ILLUSTRATIVE
Blocked work orders per year mid-size plant, all lines	300	
Average cost of delay \$ per blocked order	\$2,400	
Recoverable share cleared before the shift is lost	30%	
Planner capacity value 500 hrs × \$70 loaded	\$35,000	
Illustrative gross annual opportunity approximate opportunity	≈ \$251K / yr	

Illustrative gross opportunity before implementation and operating costs. Validate that benefit categories do not overlap before adding them together. The same approach applies to quality packets, supplier dates, and changes.



Is this work ready for an AI role?

Select one piece of recurring work and rate it from 1 to 5 against each condition. A total of 21 or above, with no factor below 3, signals work ready for an AI Workforce Review.

THE FIVE CONDITIONS OF A FUNDABLE AI WORKFLOW

Business impact	materially affects throughput, quality, or customer promises	___ / 5
Workflow repeatability	the same core steps recur across orders and shifts in a repeatable sequence	___ / 5
Source readiness	the records exist in systems you can integrate	___ / 5
Decision ownership	one accountable role that signs off today	___ / 5
Implementation path	a clean destination for the approved record	___ / 5
Your total		___ / 25

21 to 25 · Ready to map

With no factor below 3, bring it to an AI Workforce Review. The numbers are likely there.

15 to 20 · Needs discovery

Worth mapping. Expect some source or ownership work first.

Below 15 · Prepare first

Line up the records and the approval owner, then score again.

Is this the right fit?

GOOD FIT

You run recurring work like holds, quality packets, supplier follow-up, and changes

Shifts and ship dates slip in manual chasing and handoffs

Your work orders, lots, and purchase lines sit in systems you can integrate

A planner, quality lead, or buyer can stay in the approval loop

You want a production system that runs on real orders

NOT A FIT

You want a generic chatbot or a one-off prototype

There is no source of truth for work orders, items, and lots

No one owns the workflow or the outcome it affects

You are not ready to measure impact against a baseline

Put AI roles to work across your plant.

45 minutes. We look at where recurring work is costing your team the most time and map the first one or two AI roles around it. Nothing to prepare.

Book an AI Workforce Review