

TPS: people, quality and synchronized flow

Trace an order across departments, connect quality response to demand-paced flow, and choose an improvement that can be checked at the customer boundary.



The faster machine did not improve delivery

Fictional training case: Willow Valves promises 80 verified valve sets today. Machining celebrates 110 bodies, but assembly ships only 68 sets. Team leader Imani walks one order from release through inspection and assembly with operators. These supplied facts describe a teaching day; they do not establish long-term capability.

Your role and the reference condition

Value-stream leader working with machining, quality and assembly representatives.

Normal: The system provides the required verified sets at the promised time without overburdening people or producing unwanted stock.

Gap: Machine output rose while the required sets remained incomplete. Staff were encouraged to keep cutting even when the correct components were unavailable.

Work within these conditions

1. A set needs a verified body and its matching seal kit.
2. Quality and safe work remain necessary conditions; the illustration is not an authorization to change equipment.

Fictional teaching case. Supplied observations support the exercise; proposed actions are not verified customer results.

See how the method works

Begin with a customer need and the work that delivers it. Quality and flow must develop together: a faster stream that passes defects creates rework, while reliable processes still disappoint customers if work waits between them. People need a clear normal condition, permission to surface problems and support when they do. Choose one observable gap and improve it with the team. Follow the result through the whole route, rather than celebrating one machine or department. Use the drawing as a connected explanation of the system, not a mandatory sequence for installing tools.



Connected method map: Customer purpose, People and learning, Jidoka, Just-in-Time, Daily improvement. Every authored connection is shown with a numbered arrow and named legend.

Follow the evidence and decisions

Inspect the supplied case inputs

Observation	Supplied evidence
Customer need	80 verified sets due today
Machining	110 bodies completed; local target 100
Quality	12 bodies held after an unresolved bore alarm
Assembly	68 complete sets shipped
Components	Matching seal kits unavailable for further assembly
Operator voice	Alarm response takes two calls; no named backup

01 / Start at the customer boundary

Imani records the shortfall as $80 - 68 = 12$ sets, keeping it separate from machined-body output. She asks which promised orders were affected and whether shipped sets met acceptance requirements.

Why: A machine count is an intermediate measure. It cannot show whether the customer received a complete, suitable order.

Evidence / check: Customer shortfall: 12 verified sets; not 12 bodies.

02 / Follow both material and information

The team follows a body and seal kit to assembly, then traces how consumption authorizes upstream replenishment. It marks the missing kit and the unresolved quality signal at their actual handoffs.

Why: The route exposes dependence between components. A pile of one component cannot substitute for another or resolve uncertain quality.

Evidence / check: Observed links: release, machining, quality status, kit availability, assembly and shipment.

03 / Connect the two pillars

The quality owner defines who responds to the bore alarm and what evidence permits release. The flow owner checks the kit replenishment signal and lead time. Operators help make both responses practical.

Why: A quality stop needs a response, while synchronized flow needs eligible material. Pursuing flow by passing held work would undermine the system.

Evidence / check: Two owned actions: alarm-response coverage and kit-signal trace; held bodies remain controlled.

04 / Choose a bounded learning trial

For one approved replenishment cycle, the team verifies kit availability before release and records alarm-response times, complete-set delivery and operator interruptions. It declines an extra machining batch unsupported by customer need.

Why: The trial tests a cause-and-effect prediction across departments. It does not declare that both problems have already been solved.

Evidence / check: Prediction: fewer incomplete releases and unresolved waits, with verified delivery improving and no hidden work.

05 / Review the system result with the people

At the agreed review, compare complete sets, holds and workload with the prediction. If the shortage persists, follow the new evidence rather than asking machining to raise its local target again.

Why: Daily improvement develops the team's ability to see and solve problems; the display is a means to learning, not a scorecard to blame operators.

Evidence / check: Adopt, adapt or stop decision tied to order-level evidence and operator feedback.

Completed system diagnosis - fictional day

Boundary	Fact	Decision
Customer	12 sets short	Review complete orders
Quality	12 bodies held	Resolve alarm through quality owner
Supply	Seal kits unavailable	Trace replenishment information
Machining	110 bodies made	Do not infer customer benefit
Trial	Result not yet observed	Measure delivery and conditions

The held bodies are released

Quality verifies all 12 held bodies, but seal kits are still absent.

Decision

Keep the kit issue open and do not claim 12 additional shipped sets.

Reasoning

Eligibility at one operation does not remove a separate missing-component dependency.

What would change the decision?

A release record exists; the shipment record remains 68 until complete sets are actually delivered.

Practise with a changed case

The busy office with an incomplete order

Separate fictional case: a quotation team drafts 30 quotes for 24 customer requests. Only 18 complete quotes can be issued; six lack approved freight information. A manager suggests another drafting shift.

Evidence	Value
Requests due	24
Draft documents	30
Complete issued quotes	18
Missing freight approvals	6

Your task

1. Calculate the customer gap and identify which local measure is misleading.
2. Draw the missing information handoff and name its response owner.
3. Propose a small test and two outcome checks before adding drafting capacity.

Use the next page to record your reasoning before reading the answer.

Your practice worksheet

The busy office with an incomplete order

Customer outcome and gap

Material or information dependency

Quality/approval condition

Trial prediction and owner

Observed result / next decision

Complete your reasoning before turning to the answer. Use the separate learner workbook for group practice.

Check your reasoning and transfer it

1. The customer gap is 6 complete quotes. Thirty drafts do not demonstrate fulfillment of 24 requests.
2. Follow the six freight approvals, their acceptance criteria and response capacity. Additional drafts may create more waiting without completing a quote.
3. A valid trial tests approval readiness and response coverage; measure issued correct quotes and waiting/overburden, not just draft count.

Suggested completed record

Item	Evidence	Conclusion
Customer	24 required; 18 issued	6 incomplete
Dependency	Freight approval	Named commercial approver
Trial	Ready information before issue	Check correct delivery and workload

Plausible wrong turns

1. TPS is not a list of isolated efficiency projects.
2. Removing a quality check to make work flow faster is not a demonstrated system improvement.

Evidence of a sound answer

1. Distinguish intermediate output from customer fulfillment.
2. Show both the response to abnormality and the replenishment/approval dependency.
3. Specify evidence that could disprove the proposed improvement.

Take the learning back to work

Commitment	Agreed follow-through
Owner	Value-stream owner with process representatives
Record	One order trace, abnormality-response record and trial prediction
Review	At the next daily review and after the agreed trial cycle
Verification evidence	Verified delivery, unresolved holds, kit readiness and operator feedback
If unresolved	Escalate cross-department response gaps; revise the trial with evidence rather than adding local output targets.

Help someone else apply the method

Prepare

1. Case sheet, order tokens and two colored arrow pens
2. Blank end-to-end record; answer kept separate

Minutes	Activity and coaching prompt
4	Define the system outcome Why can 110 bodies coexist with 68 shipped sets?
8	Trace one order in pairs Which missing link prevents completion, and who can respond?
8	Run the office variant What would an extra drafting shift actually change?
5	Challenge the trial Which result would make you stop or adapt it?

Debrief

1. Ask whether the held-body and seal-kit problems are independent.
2. Invite an operator perspective before accepting a management target.

Individual or remote practice

Trace the order aloud and write the customer-level prediction before checking the answer.

Connect the method and check its boundaries

Before application

1. Named process owner
2. Observable customer need

Outside this lesson

1. TPS is not a tool checklist
2. Just-in-Time does not mean zero protective stock everywhere

Toyota Production System

Toyota Production System

TPS purpose, people, jidoka and synchronized Just-in-Time

Method reference; original OPEX scenario and diagram are synthetic teaching content, not source case results.

[Open this lesson and its visual aids](#)