

Choose the quality tool for the question

Turn a vague quality concern into an answerable question, select a suitable evidence display, and state what that display cannot establish.



A pile of records is not yet a question

Fictional case: Vale Dispatch has delivery complaints, measured packing times and a list of possible causes. Coordinator Lina is asked to produce a quality chart for the weekly meeting. The manager wants to know where to begin, while a technician wants to know whether packing time changes with batch size. These are different questions; one attractive chart cannot answer both.

Your role and the reference condition

Dispatch coordinator and process analyst

Normal: Every proposed display has a stated question, an observation unit, a defined window and an honest limit of inference. Raw records retain their original identities.

Gap: A draft slide mixes complaints, hours and suggested causes into one descending bar chart. Its title says the biggest bar is the root cause.

Work within these conditions

1. The seven-tool overview is a selection aid, not a compulsory sequence.
2. A severe isolated complaint can require immediate response even when it ranks low by frequency.

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

See how the method works

Choosing a tool starts with the decision, not with a favourite diagram. A check sheet collects observations consistently; a Pareto ranks a stated burden; a histogram displays a distribution; and a scatter plot explores paired variables. A control chart adds time and a baseline model. A fishbone organizes possible causes, while stratification separates sources that pooling may hide. These tools can be used together, but each answers a different question. First write the question in plain language. Then choose the smallest useful display and state what further evidence is needed before acting.

Record consistently

Check sheet: define categories and denominator.

Rank a burden

Pareto: choose count, cost or time.

See a distribution

Histogram: retain time and source records separately.

Explore paired variables

Scatter plot: association does not prove cause.

Organize possible causes

Fishbone: branches remain hypotheses until tested.

Separate mixed sources

Stratification: compare relevant groups with denominators.

Monitor over time

Control chart: choose data model, baseline and response.

Choose from the question, then state the limit of inference. This is not an imposed problem-solving sequence.

Follow the evidence and decisions

Inspect the supplied case inputs

Available evidence	What it can support
Complaint log	Category, date and shipment identity; counts can be compared within the same window
Packing observations	Paired batch size and packing minutes for each observed job
Cause list	Three untested explanations suggested by the team
Measurement history	Ordered packing times with operating context; baseline assumptions not yet assessed

01 / Write the decision first

Lina separates "Which complaint category contributes most occurrences this week?" from "Do larger batches tend to take longer?" She records the intended user of each answer.

Why: The question determines the evidence and display. Starting from a preferred graphic invites conclusions that the available records cannot support.

Evidence / check: Two written questions, each tied to a decision rather than "make a chart".

02 / Check the collection unit

She defines one complaint occurrence and checks duplicates against shipment IDs. For the timing question she keeps each batch-size/time pair together instead of sorting the two columns separately.

Why: Comparable counts need a consistent category rule. A paired relationship disappears or becomes fictitious if the observations lose their pairing.

Evidence / check: Complaint records retain their window; every time has its matching batch size.

03 / Choose the first two views

She assigns a Pareto chart to complaint frequency and a scatter plot to the paired observations. A check sheet is the next collection method if future categories are inconsistent.

Why: Pareto ranks a chosen burden; scatter explores association. Neither is a root-cause verdict, and neither replaces the record definitions.

Evidence / check: The chart request identifies tool, input and permissible interpretation.

04 / Place other questions deliberately

A histogram can summarize packing-time distribution; stratification can separate routes or product groups; a fishbone can organize competing hypotheses. Time behavior needs ordered data and an appropriate run/control view.

Why: These tools reveal different structures. Mixed sources, timing and causal hypotheses should not be folded into an unexplained "quality score".

Evidence / check: A selection record covers all seven roles without claiming that every project must use every tool.

05 / Approve a bounded next step

Lina asks the manager to prioritize a category for investigation and asks the analyst to assess the paired data. She removes the root-cause title and records the unresolved checks.

Why: A useful display ends with a defensible decision and the next evidence needed. Restraint about causation is part of using the tool correctly.

Evidence / check: The meeting assigns evidence collection, not a causal conclusion from a bar height.

Completed question-to-tool record

Question	Chosen view	Boundary
Where are most comparable complaints?	Pareto of complaint occurrences	Priority by frequency, not proven cause
Does time vary with batch size?	Scatter of paired jobs	Association only
Which explanations should be tested?	Fishbone plus test record	Branches remain hypotheses
Are sources hiding different patterns?	Stratified views	Keep denominators and uncertainty
How does behavior evolve?	Ordered monitoring view	Check baseline/model before control conclusions

The manager changes the basis

The manager now asks which complaint type consumes the most recovery hours.

Decision

Rebuild the Pareto using documented recovery time for every included category, label hours and retain the original frequency chart separately.

Reasoning

Changing the basis can change the rank. Adding hours to occurrence counts would produce an uninterpretable total.

What would change the decision?

A revised request names recovery hours and the same declared reporting window.

Practise with a changed case

Select evidence for three different decisions

New fictional case: a clinic has appointment-delay minutes, delay categories and two proposed explanations. The supervisor asks for a distribution, the largest time burden and a way to test explanations.

Request	Available record
Typical spread	Twenty ordered delay measurements
Largest burden	Delay category and minutes for each event
Explanation	Two staff suggestions; no tests yet

Your task

1. Choose a view for each request and identify the input it needs.
2. State one conclusion that would be unjustified from each view.
3. Explain why a category with fewer events could lead a time-based ranking.

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

Your practice worksheet

Select evidence for three different decisions

Decision question

Unit and window

Chosen tool

Permitted conclusion

Next evidence

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

Check your reasoning and transfer it

1. Use a histogram for distribution while retaining order elsewhere, a Pareto of summed delay minutes for the burden, and a hypothesis/test record informed by a fishbone for explanations.
2. A histogram does not establish stability; a time Pareto does not prove cause; a fishbone does not verify a branch. A rare long delay can contribute more minutes than many short delays.

Suggested completed record

Request	Defensible selection	Required boundary
Distribution	Histogram of delay minutes	No stability claim
Time burden	Pareto of minutes by category	One comparable basis
Explanation	Competing hypotheses and tests	Zero causes verified initially

Plausible wrong turns

1. The familiar 80/20 phrase is not a result to impose on the data.
2. Tool names do not replace an operational definition.

Evidence of a sound answer

1. Match each question to a suitable view.
2. Preserve time/pair/source information needed for later analysis.
3. Separate prioritization from causal proof.

Take the learning back to work

Commitment	Agreed follow-through
Owner	Process analyst with the record owner
Record	Question, collection definition, selected display and interpretation note
Review	At the next evidence review
Verification evidence	A colleague can reproduce the display and distinguish findings from hypotheses
If unresolved	Return to data definition or collection when the requested conclusion exceeds the evidence.

Help someone else apply the method

Prepare

1. Blank question-to-tool sheet
2. Three evidence cards
3. Answer kept separately

Minutes	Activity and coaching prompt
4	Frame the meeting request What decision is hidden inside "make a quality chart"?
8	Match and challenge Defend a tool, then name what it cannot tell us.
10	Complete the clinic exercise Which unit belongs on each axis or total?
5	Debrief transfer What raw information must survive the display?

Debrief

1. Accept alternative suitable tools when the question and boundaries are explicit.
2. Challenge any claim of a cause based only on ranking or consensus.

Individual or remote practice

Individually write each request as a question before looking at the seven-tool overview.

Connect the method and check its boundaries

Before application

1. A defined decision question
2. An identified observation source

Outside this lesson

1. A complete problem-solving methodology
2. Automatic root-cause proof

ASQ: Seven basic quality tools

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The classic seven include fishbone, check sheet, control chart, histogram, Pareto, scatter and stratification; some lists substitute flowchart or run chart.

Public primary-source summary; underlying paid standards/forms are not reproduced.

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