

Quality and continuous improvement

One formula and four key rules, each with a worked example, then the two model sheets. They serve IPMA, PMI and APM exams alike.

FORMULA AND KEY RULES

Cost of quality (after Feigenbaum, 1956)

CoQ = getting it right (prevention, appraisal) + getting it wrong (internal, external failure)

Prevention: training, clear criteria. Appraisal: reviews, tests. Internal failure: rework before delivery. External failure: fixes and complaints after it. More prevention pays only up to an optimal point (PMBOK® Guide 8).

Example: Before: €2k + €8k + €30k + €20k = €60k. With €10k more prevention: €12k + €8k + €15k + €5k = €40k, so €20k less in total

Does prevention pay? (key rule)

worth it if its cost < the failure cost it removes

Compare in money or in days. A defect that keeps coming back points to the process: fix the process, not only the item.

Example: An automated check takes 4 days to set up, once, and cuts rework from 10 days to 3 per iteration: 7 days saved, more than 4, so it pays in the first iteration

Four checks (key rule)

assurance → the process · control → each deliverable · verification → the specification · validation → the real need

Assurance prevents defects; control finds them. The project verifies, as early as it can; users or the client validate, ending in formal acceptance.

Example: An online renewal form: every field works as specified (verified); 5 residents in a test renew without help (validated)

Acceptance criteria and the definition of done (key rule)

acceptance criteria → one item · definition of done → every item

Agree criteria before the work starts. The definition of done is a checklist every item must pass to count as finished (PMBOK Guide; the Scrum Guide).

Example: Item: renew a permit online. Criterion: a test user renews in under 3 minutes. Done, for every item: 4 checks (code reviewed, tests pass, accessibility checked, help text written)

Plan-do-check-act (after Shewhart, 1939, and Deming)

plan a target and one change → do it small → check against the target → act: adopt, or go again

A retrospective or a lessons-learned review is one turn of the loop when its action has an owner and is checked next time.

Example: Staff ask 12 questions a day about one chapter of a guide. Target: half, 6 a day. After a rewrite, 2 staff use it for a week: 5 a day, so the other chapters are rewritten the same way

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Quality assurance vs quality control

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Plan-do-check-act (PDCA)

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Sources: IPMA ICB4 (2015); PMI, PMBOK® Guide, 8th ed.; PMI, PMP® Examination Content Outline (2026); APM Body of Knowledge, 8th ed.; APM, PMQ handbook (v6, 2026); IPMA International Certification Regulations (ICR) v4.4 (2025); Kerzner, Project Management: A Systems Approach (11th ed.); Crosby, Quality Is Free (1979); Feigenbaum (1956), Total quality control; Shewhart, Statistical Method from the Viewpoint of Quality Control (1939); Deming, Out of the Crisis (1986); Moen & Norman (2010), Circling back; Schwaber & Sutherland, The 2020 Scrum Guide™

Key: IPMA = International Project Management Association; ICB4 = IPMA's Individual Competence Baseline; PMI = Project Management Institute; PMBOK® Guide = PMI's body-of-knowledge guide; PMP® = PMI's Project Management Professional; APM = Association for Project Management; PMQ = APM's Project Management Qualification; ICR = IPMA's International Certification Regulations. Unofficial study material for IPMA®, PMI® and APM exams. Not affiliated with, endorsed by or approved by IPMA, PMI or APM, and not an accredited or endorsed training provider. IPMA® and IPMA ICB® are registered trademarks of IPMA in Switzerland and other countries. PMI, PMP, CAPM and PMBOK are registered marks of Project Management Institute, Inc. APM is a trade mark of the Association for Project Management. Other marks belong to their owners. PMP® exam facts are from PMI's public PMP® Examination Content Outline (2026); check the current version on [pmi.org](https://www.pmi.org). APM's qualifications are its own; this series is not an APM Accredited Provider or APM Endorsed. Examples use a fictional city and its projects.

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Quality assurance vs quality control

Keep four quality checks apart: process, deliverable, specification and real need.

CHECK	LOOKS AT	ASKS	DONE BY
Assurance	The process	Are we working as planned?	Often independent reviewers
Control	Each deliverable	Does it meet its criteria?	The team and testers
Verification	Output vs specification	Built as specified?	The project, early and at phase ends
Validation	Outcome vs real need	Does it meet the need?	Users or the client

The series' own summary of four checks. Assurance prevents defects; control finds them.

WHAT IT IS

Quality has two sides: how the work is done, and what it delivers. **Assurance** checks the process against the quality plan, with audits and reviews, to prevent defects. **Control** checks each deliverable against its acceptance criteria, by test or inspection, to find them. **Verification** asks whether an output was built as specified; **validation** whether the outcome meets the real need, ending in formal acceptance.

HOW IT WORKS

- 01 Plan: acceptance criteria, and who checks what, when.
- 02 Assure the process; control each deliverable.
- 03 Verify early; users validate; the client accepts.
- 04 On a finding: root cause, then corrective action.

MID-LEVEL • WORKED EXAMPLE

Apply it well

The situation: A city team has 8 months to move parking permits online with a supplier; 40 wardens will check the permits on handheld devices.

The supplier tests its code (control). The city team checks each delivery against its criteria (verification). An outsider audits whether planned reviews happen (assurance). Before go-live, 4 wardens try the handheld check (validation).

In the exam: Name the check and why: an audit for the process, a test for the product. Then give one verification and one validation from your work, and say who formally accepted the result.

SENIOR • WORKED EXAMPLE

Design and lead it

The situation: A city is joining 14 online services under one login over 30 months, with 2 suppliers and 9 owners of old systems, each with its own quality procedures.

The project manager agrees one common standard with the steering board, tailored from the city's and the suppliers' own. Independent reviews before each gate report to the board. Accessibility groups help validate each group of services, and each service owner accepts before its old portal closes.

In the exam: Show how you joined several organisations' standards into one, who audits it, how findings reach the board, and how validation is organised for each release.

WHERE IT SITS

IPMA • ICB4	PMI • PMBOK® GUIDE 8 • PMP® EXAM	APM • BOK 8 • PMQ EXAM
4.5.6: two sides, process and output; audits (4.5.6.2), verification (4.5.6.3), validation (4.5.6.4)	Guide §2.1.6.5, p. 23: Manage Quality Assurance, QA and QC; verified deliverables to Validate Scope, p. 143. PMP (Project Management Professional) outline: Process, task 7	BoK (APM's Body of Knowledge) §5.3.2–5.3.3: QA prevents, QC detects; QA is not project assurance. PMQ (APM's Project Management Qualification) outcome 18b

Sources: IPMA ICB4 (2015); PMI, PMBOK® Guide, 8th ed.; PMI, PMP® Examination Content Outline (2026); APM Body of Knowledge, 8th ed.; APM, PMQ handbook (v6, 2026)

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Plan–do–check–act (PDCA)

Improve a process or a deliverable in small, tested steps.



Our own loop, after Shewhart and Deming. History: Moen and Norman (2010).

WHAT IT IS

A loop for learning by testing. **Walter Shewhart** (1939) described it. **W. Edwards Deming** taught it in Japan in 1950 as plan–do–check–act, naming it the Shewhart cycle; he later preferred ‘study’ to ‘check’ (Moen and Norman, 2010). A **retrospective** or lessons-learned review is one turn, if tested and checked.

HOW IT WORKS

- 01 Plan: the problem, a target, one change to test.
- 02 Do: try the change small; record what happens.
- 03 Check: compare the result with the target.
- 04 Act: adopt it as the standard, or adjust and go again.

MID-LEVEL · WORKED EXAMPLE

Apply it well

The situation: A city team is moving parking permits online in 8 months. Its service-desk staff ask about 12 questions a day on one chapter of their new desk guide.

Plan: rewrite that chapter, aiming to halve the questions, to 6 a day. Do: 2 staff use it for a week. Check: questions fall to 5 a day, under the target. Act: the other chapters are rewritten the same way.

In the exam: Present a corrective action as a small loop: the target, the change you tested, the evidence that it worked, and what became the new standard.

SENIOR · WORKED EXAMPLE

Design and lead it

The situation: A city is joining 14 online services under one login over 30 months, in groups, with 2 suppliers and a steering board that owns the common quality standard.

After each group goes live, a lessons review with both suppliers compares defects with the targets. The board approves one change to the standard before the next group starts; the next review checks it.

In the exam: Show the loop as governance: how a lesson from one release or supplier changed the standard for the others, who approved it, and how you checked that it worked.

WHERE IT SITS

IPMA · ICB4	PMI · PMBOK® GUIDE 8 · PMP® EXAM	APM · BOK 8 · PMQ EXAM
4.5.6: the Deming cycle in its knowledge list; regular check-ups and improvements (4.5.6.5)	Standard §3.5, quality principle; retrospectives, pp. 194–195. PMP (Project Management Professional) outline: Business Environment, task 6	BoK (APM's Body of Knowledge) §5.3.4 Continuous improvement: the Shewhart cycle as its basis. PMQ (APM's Project Management Qualification) outcome 8b: learning from experience

Sources: Shewhart, Statistical Method from the Viewpoint of Quality Control (1939); Moen & Norman (2010), Circling back; IPMA ICB4 (2015); PMI, PMBOK® Guide, 8th ed.; PMI, PMP® Examination Content Outline (2026); APM Body of Knowledge, 8th ed.; APM, PMQ handbook (v6, 2026)

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