

Control chart

Tell normal variation from a real signal over time, so you act on special causes and change the process for the rest.



Illustrative. Days 1–10: mean 10, $s = 2$, so limits 10 ± 6 . Day 11 is above the UCL (upper control limit); days 14–20 run above the mean.

WHAT IT IS

Walter Shewhart set out the method in 1931. Plot one measure over time with its **mean** and **control limits**: by a common convention, the mean ± 3 standard deviations of a stable period (Kerzner). Points between them are **common cause** variation, the noise of the process. A point outside, or seven in a row on one side, signals a **special cause**. **Specification limits** come from the requirements, not the data.

HOW IT WORKS

- 01 Take a stable period: its mean and standard deviation, s .
- 02 Limits: mean $\pm 3s$. Draw the target apart.
- 03 Signals: a point outside, or 7 in a row on one side.
- 04 In control but off target? Change the process.

MID-LEVEL · WORKED EXAMPLE

Apply it well

The situation: A city team has moved resident parking permits online. Over 20 days, payments fail 5 times a day on average ($s = 1$); the target is at most 7.

Limits: $5 \pm 3 \times 1$, so 2 and 8. Days of 6 or 7 are common cause, left alone. Day 23 has 9, above 8: a special cause. The payment provider had changed a setting.

In the exam: Show the mean and limits with the arithmetic, name each signal, keep control limits apart from the target.

SENIOR · WORKED EXAMPLE

Design and lead it

The situation: A city is joining 14 online services under one login over 30 months, with two main suppliers.

Each key measure has a chart with agreed signals, an owner and a time to react. Supplier service levels are specification limits, and the data is shared. Common cause variation is not a person's fault.

In the exam: Explain the rules for many parties: which signals start action, who acts, how fast, and no blame for noise.

WHERE IT SITS

IPMA · ICB4	PMI · PMBOK® GUIDE 8 · PMP® EXAM	APM · BOK 8 · PMQ EXAM
4.5.6.1: indicators with quality target values (p. 120); 4.4.8.3: data and trends (p. 90)	Guide p. 158: control limits are not specification limits. Exam outline: Process task 7	BoK (APM's Body of Knowledge) §5.3.3: QC measures outputs against the acceptance criteria. PMQ (APM's Project Management Qualification) objective 18b

Sources: Shewhart, Economic Control of Quality of Manufactured Product (1931); Kerzner, Project Management: A Systems Approach (11th ed.); 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)

Key: IPMA = International Project Management Association; ICB4 = IPMA's Individual Competence Baseline (4.5.6 etc.: its competence elements); PMI = Project Management Institute; PMBOK® Guide = PMI's body-of-knowledge guide; PMP® = PMI's Project Management Professional; APM = Association for Project Management. 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. 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. Levels (this series' labels): Mid-level = moderately complex projects (IPMA Level C, PMI's PMP®); Senior = complex projects and people (IPMA Level B, APM's Chartered Project Professional).

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