
Root Cause Analysis and Problem Solving Training Course: DMAIC, A3 and Lean

3 – 7 January 2027
Muscat





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Programme Summary

Root cause analysis and problem solving is the subject of this one-week training course for operations managers, quality leaders and improvement sponsors, ending in a problem-solving file for one recurring problem. Teams often act on the first explanation they hear, so the same defect, delay or complaint returns. The programme follows the DMAIC cycle from problem definition to control, using data, Lean tools and A3 reporting on the participant's own problem. Mars Training Centre UK delivers this programme on root cause analysis and problem solving to mixed-organisation cohorts.

The Business Case

Recurring problems drain capacity in every sector. A defect is reworked, a delay is expedited and a complaint is answered, yet the cause stays in place and the cost returns next month. Managers who define the problem precisely, test causes against data and verify fixes can stop repeat failures at source instead of absorbing them.

- Repeat Failure Rate: Falls as causes are proven with evidence and removed rather than guessed.
- Rework and Scrap Cost: Falls as defects are traced to process causes and controlled.
- Improvement Project Yield: Rises as sponsors can judge the quality of problem statements and analysis.

Principles and Evidence Base

- DMAIC: The define, measure, analyse, improve and control cycle sets the order of Sessions 1 to 5.
- ISO 13053: The international standard on quantitative methods in process improvement for Six Sigma frames the data tools used in Sessions 2 and 3.
- Pareto analysis: Ranking causes by frequency or cost focuses the effort in Session 2.
- A3 reporting: Telling the problem on one page, with cause, countermeasure and follow-up, structures the report in Session 5.

Intended Participants

- Operations managers who are accountable for recurring defects, delays or failures.
- Quality leaders who coach teams in problem-solving methods.
- Improvement sponsors who approve projects and review their evidence.
- Plant, service and process leaders who must show that a fix has worked.

Typical functions include manufacturing, logistics, healthcare operations, banking operations and customer service teams.



Learning Outcomes

1. Participants will be able to construct a problem statement and project charter with a measurable gap.
2. Participants will be able to evaluate whether measurement data is reliable enough to act on.
3. Participants will be able to diagnose root causes with Pareto, cause and effect and 5 Whys analysis.
4. Participants will be able to design countermeasures and test them before full rollout.
5. Participants will be able to prioritise solutions by impact, effort and risk.
6. Participants will be able to justify a control plan and an A3 report to a sponsor.

Programme Structure

Day 1: Defining the Problem and Project Charter

What exactly is going wrong, for whom, and how large is the gap?

- Problem Statement Template
- Project Charter
- Voice of the Customer Capture
- High-Level Process Map
- Stakeholder and Scope Check

Day 2: Measuring the Problem and Checking the Data

Can the data be trusted, and where does the problem concentrate?

- Data Collection Plan
- Measurement Reliability Check
- Pareto Chart
- Baseline Performance Chart
- Stratification Table

Day 3: Root Cause Analysis

Which causes are proven by evidence, and which are only opinions?

- Cause and Effect Diagram
- 5 Whys Chain
- Lean Waste Review
- Cause Verification Test
- Scatter and Run Chart Analysis



Day 4: Improving and Testing Countermeasures

Which fix removes the cause and can be tested safely first?

- Countermeasure Option List
- Impact and Effort Matrix
- Failure Mode Check
- Pilot Test Design
- Before and After Comparison

Day 5: Applying the Tools to One Recurring Problem

Do the charter, data, causes and fix form one evidence file a sponsor can approve?

- Applying the Session 1 Project Charter
- Using the Session 2 Pareto Chart
- Testing the Session 3 Cause Verification Test
- Checking the Session 4 Pilot Test Design
- Completing the A3 Report and Control Plan

Methodology

The programme uses a case analysis method built on anonymised defect logs, delay records and complaint files from manufacturing, healthcare and service settings. Participants work on a recurring problem of their own in peer groups, test each cause against data and receive written facilitator feedback on every exercise set.

- Suggested activity: Rewriting a vague complaint into a measurable problem statement.
- Suggested activity: Ranking defect causes with a Pareto chart from a supplied log.
- Suggested activity: Challenging a 5 Whys chain to find where evidence is missing.

Capstone Output

Each participant completes a problem-solving file for one recurring problem. It holds a charter, a baseline chart, a verified cause analysis, a tested countermeasure and a control plan, summarised on an A3 report. The file is used at work to seek sponsor approval, hand the fix to the process owner and check results at agreed review points.



Frequently Asked Questions

Is root cause analysis and problem solving suitable for managers with no statistics background?

Yes. Root cause analysis and problem solving here assumes operational experience, not statistics, and introduces simple charts and checks step by step on real data.

Which standard or model does root cause analysis and problem solving rest on?

Root cause analysis and problem solving here rests on the DMAIC cycle, supported by ISO 13053 for quantitative methods, Pareto analysis and A3 reporting.

How is the file from root cause analysis and problem solving used at work?

You use the problem-solving file to gain sponsor approval, pilot the countermeasure, hand control to the process owner and review results at set intervals.

How does root cause analysis and problem solving differ from general quality management training?

Root cause analysis and problem solving centres on defining, measuring and fixing one recurring problem, while general quality management training centres on systems, audits and policy.