Process Improvement Analytics Training Course: Lean, Machine Learning and Control Plans

18 – 29 October 2026
Muscat

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Programme Summary

Process improvement analytics, combining Lean, event data and machine learning, is the subject of this two-week training course for operations, process excellence and transformation leaders, ending in an improvement roadmap for one end-to-end process. Delay, rework and idle capacity hide inside processes that nobody sees whole, and automation is often added before the cause is known. The programme moves from process baselines to flow, event data, prediction, simulation, automation and controls, using prepared operating data. Mars Training Centre UK delivers this programme on process improvement analytics to mixed-organisation cohorts.

The Business Case

Manufacturers, logistics firms, banks and public services all run processes that cross several teams and systems. Leaders who can measure how work flows, read event data, judge where prediction or automation helps and keep gains under control spend improvement effort where it changes results, and can show a board why.

- Cycle Time: Falls when bottlenecks are located from event data before changes are made.
- Rework Rate: Decreases when causes are tested and control plans hold the gain.
- Improvement Return: Rises when automation and prediction choices are ranked on evidence and tracked as benefits.

Principles and Evidence Base

- Lean: A management approach centred on removing waste and delay along a value stream, applied in Sessions 1 and 2 to baseline a process.
- Six Sigma DMAIC: A structured define, measure, analyse, improve and control cycle, applied in Sessions 4 and 8 to gate analysis and control.
- Process Mining: Analysis of event logs to discover how work actually runs, applied in Session 3 to find variants and delays.
- ISO 9001: The quality management system standard built on a process approach, applied in Session 1 to review process ownership.
- ISO/IEC 42001: The management system standard for AI, applied in Session 8 to set ownership of models in operations.

Intended Participants

- Operations leaders who own end-to-end processes and their results.
- Process excellence and continuous improvement managers who select and sponsor improvement projects.
- Transformation and digital leaders who decide where automation and AI belong in a process.
- Quality and risk managers who set the controls that keep gains in place.

Typical settings include manufacturing, logistics, financial services and public services.

Learning Outcomes

1. Participants will be able to construct a process baseline from a value stream map and flow measures.
2. Participants will be able to diagnose bottlenecks and variants from an event log.
3. Participants will be able to evaluate a prediction model for delay or workload by its error and its cost.
4. Participants will be able to compare simulated capacity and scheduling options for a process.
5. Participants will be able to prioritise automation candidates by value, exception rate and risk.
6. Participants will be able to justify a control plan and benefit tracking routine to an operating committee.

Programme Structure

Day 1: Process Improvement Analytics Foundations

Which process problem is worth solving first?

- Improvement Opportunity Long List
- Lean Waste Taxonomy
- Value Stream Map
- ISO 9001 Process Approach Review
- Process Baseline Sheet

Day 2: Flow, Capacity and Variation

How does work move, and where does it wait?

- Cycle and Lead Time Sheet
- Throughput and Queue Model
- Variation Run Chart
- Measurement System Check
- Capacity Constraint Map

Day 3: Event Data and Process Mining

What does the event log show that interviews miss?

- Event Log Specification
- Case, Activity and Timestamp Mapping
- Process Discovery Map
- Variant Analysis
- Conformance Check

Day 4: Bottlenecks and Root Causes

Which delay and rework causes are proven?

- Bottleneck Heat Map
- Rework Loop Analysis
- Pareto Chart Review
- Cause and Effect Matrix
- DMAIC Analyse Gate Review

Day 5: Prediction for Operations

Where can a model forecast delay or workload usefully?

- Prediction Use Case Canvas
- Delay Prediction Model Reading
- Workload Forecast Check
- Feature and Label Plan
- Model Error Cost Table

Day 6: Simulation and Capacity Design

What happens to flow if the design changes?

- Discrete Event Simulation Model
- Staffing Scenario Table
- Scheduling Rule Comparison
- Buffer and Queue Policy
- Scenario Result Sheet

Day 7: Automation and Process Redesign

Which steps should be automated, and which kept with people?

- Automation Candidate Screen
- Human Handoff Design
- Decision Rule Library
- Exception Path Map
- Future State Process Map

Day 8: Controls and Responsible Use of AI

How are gains held and models kept under control?

- Control Plan Template
- Process Monitoring Chart
- NIST AI Risk Management Framework Mapping
- ISO/IEC 42001 Ownership Review
- Model Drift Trigger List

Day 9: Benefits, Change and Governance

How are improvements chosen, tracked and sustained?

- Benefit Tracking Ledger
- Pilot Gate Criteria
- Improvement Portfolio Scoring Matrix
- Adoption Plan
- Operating Review Cadence

Day 10: Improvement Roadmap for One End-to-End Process

Do the findings join into a costed, sequenced roadmap?

- Applying the Session 1 Process Baseline Sheet
- Testing the Session 3 Process Discovery Map
- Comparing the Session 5 and Session 6 Option Sheets
- Checking the Session 8 Control Plan
- Completing the Improvement Roadmap

Methodology

The programme is a data workshop built on prepared event logs and operating records for a service process and a production line. Participants map flow, mine the logs, test models and simulations and defend a roadmap to peers acting as an operating committee.

- Suggested activity: Drawing a value stream map and marking the waiting steps.
- Suggested activity: Reading a process discovery map to find the most costly variant.
- Suggested activity: Comparing two staffing scenarios in a prepared simulation.

Capstone Output

Each participant completes an improvement roadmap for one end-to-end process. It holds the baseline sheet, the discovery map, ranked prediction and automation options, a control plan and a benefit ledger. At work it goes to the operating committee and sets the routine for choosing and tracking later improvement projects.

Frequently Asked Questions

Is process improvement analytics training suitable for leaders who are not data analysts?

Yes. Process improvement analytics is taught through prepared logs, maps and templates. You need responsibility for operations, improvement or transformation, but no programming or statistics background.

Which methods does process improvement analytics rest on in this training?

Process improvement analytics here rests on Lean, Six Sigma DMAIC, process mining, ISO 9001 and ISO/IEC 42001, each applied to a baseline, analysis or control decision.

How is the roadmap from process improvement analytics training used at work?

You take the improvement roadmap to your operating committee, use its ranked options to choose projects, and keep its control plan and benefit ledger as the routine for later improvements.

How does process improvement analytics differ from a programme on robotic process automation?

Process improvement analytics concentrates on finding and proving causes of delay and rework before choosing a fix, while a programme on robotic process automation concentrates on building software robots for chosen tasks.