

Quality America, Inc.

Online Black Belt Training

Overview

1. Why Do Six Sigma
 - a) Definition and graphical view of Six Sigma
 - (i) Overview of business applications
 - (ii) Example Sigma Levels
 - (iii) Introduction to DPMO and cost as metrics.
 - b) Comparisons between typical TQM and Six Sigma Programs.
 - c) Origins and Success Stories.
2. How to Deploy Six Sigma
 - a) Leadership responsibilities.
 - b) Description of the roles and responsibilities.
 - c) Resource allocation.
 - d) Data driven decision making.
 - e) Organizational metrics and dashboards.
3. Six Sigma Projects
 - a) Project Focus.
 - b) Selecting Projects.
 - c) Overview of DMAIC methodology.
 - d) Project Reporting.
4. Incorporating Voice of the Customer
 - a) Goal Posts vs. Kano.
 - b) Customer Focus and the Leadership Role.
 - c) Overview of QFD.
 - d) Customer Data.
 - e) Big Y's, Little Y's.
5. DEFINE: Project Definition
 - a) Tasks.
 - b) Work Breakdown Structure.
 - c) Pareto Diagrams.
 - d) Process Maps.
 - e) Matrix Diagrams.
 - f) Project Charters.
 - g) Reporting.
6. DEFINE: Project Financials
 - a) Quality Cost Classifications.
 - b) Quantifying Project Benefits.
 - c) Calculations.
7. DEFINE: Goals & Metrics

- a) CTC, CTQ, CTS Parameters.
 - b) CTx Flow-down Model (Big Y's, Little y's).
 - c) Measurement & Feedback.
 - d) Calculating Sigma Levels.
8. DEFINE: Project Scheduling
- a) Activity Network Diagram.
 - b) PERT Analysis.
 - c) GANNT Chart.
9. DEFINE: Change Management / Teams
- a) Problems with Change.
 - b) Achieving Buy-In.
 - c) Team Formation, Rules & Responsibilities.
 - (i) Stages of Team Development.
 - (ii) Overcoming Problems.
 - d) Consensus Building
 - (i) Affinity Diagram.
 - (ii) Nominal Group Technique.
 - (iii) Prioritization Matrix.
10. MEASURE: Tools
- a) Measure Stage Objectives
 - b) Flowcharts.
 - c) Process Maps.
 - d) SIPOC.
 - e) Box-Whisker Plots.
 - f) Cause & Effect Diagrams.
 - g) Check Sheets.
 - h) Interrelationship Digraph.
 - i) Stem & Leaf Plots.
11. MEASURE: Establishing Process Baseline
- a) Enumerative vs. Analytic Statistics.
 - b) Process Variation.
 - (i) Deming's Red Bead.
 - c) Benefits of Control Charts.
 - d) Requirements vs. Control.
 - (i) Tampering.
 - e) Control Chart Interpretation.
 - (i) Relative to Process Baseline Estimates.
12. MEASURE: X-Bar Charts
- a) Uses.
 - b) Construction & Calculations.
 - c) Assumptions.
 - d) Rational Subgroups.

- e) Sampling Considerations.
 - f) Interpretation.
 - (i) Run Test Rules.
13. MEASURE: Individuals Data
- a) Uses.
 - b) Construction & Calculations.
 - c) Assumptions.
 - d) Sampling Considerations.
 - e) Interpretation.
 - f) Overview of Other Individuals Charts.
 - (i) Run Charts.
 - (ii) Moving Average Charts.
 - (iii) EWMA Charts.
14. MEASURE: Process Capability
- a) Histograms.
 - b) Probability Plots.
 - c) Goodness of Fit Tests.
 - d) Capability & Performance Indices.
 - (i) Relative to Process Control.
 - (ii) Interpretation.
 - (iii) Estimating Error.
15. MEASURE: Attribute Charts
- a) Uses.
 - b) Selection.
 - c) Construction & Calculations.
 - d) Sampling Considerations.
16. MEASURE: Short Run SPC
- a) Uses.
 - b) Calculations.
 - (i) Nominals chart.
 - (ii) Stabilized Chart.
17. MEASURE: Measurement Systems Analysis
- a) Stability Studies.
 - b) Linearity Analysis.
 - c) R&R Analysis.
 - (i) Range Method Calculations.
 - (ii) Interpretation.
 - (iii) Using Control Charts.
 - (iv) Destructive Tests.
 - (v) ANOVA Method.
18. ANALYZE: Lean Thinking
- a) Definition of Waste.

- b) Analyzing Process for NVA.
 - (i) Cycle Efficiencies
 - (ii) Lead Time and Velocity
 - c) Methods to Increase Velocity.
 - (i) Standardization
 - (ii) Optimization
 - (iii) Spaghetti Diagrams
 - (iv) 5S
 - (v) Level Loading.
 - (vi) Flow
 - (vii) Setup Reductions
19. ANALYZE: Sources of Variation
- a) Multi-vari Plots
 - b) Confidence Intervals on Mean
 - c) Confidence Intervals on Percent
 - d) Hypothesis Test on Mean
 - e) Hypothesis Test on Mean of Two Samples
 - f) Power & Sample Size.
 - g) Contingency tables.
 - h) Non-parametric Tests.
20. ANALYZE: Regression Analysis
- a) Scatter Diagrams.
 - b) Linear Model.
 - c) Interpreting the ANOVA Table.
 - d) Confidence & Prediction Limits.
 - e) Residuals Analysis.
 - f) Overview of Multiple Regression Tools
 - (i) DOE vs. Traditional Experiments & Data Mining
21. ANALYZE: Multiple Regression
- a) Multivariate Models.
 - b) Interaction Plots.
 - c) Interpreting ANOVA Tables.
 - d) Model Considerations.
 - e) Stepwise Regression.
 - f) Residuals Analysis.
22. ANALYZE: DOE Introduction
- a) Terminology
 - b) DOE vs. Traditional Experiments
 - c) DOE vs. Historical Data
 - d) Design Planning.
 - e) Design Specification.
 - (i) Selecting Responses.

- (ii) Selecting Factors and Levels.
- f) Complete Factorials.
- g) Fractional Factorials.
 - (i) Aliasing.
 - (ii) Screening Designs.
- 23. ANALYZE: DOE Analysis Fundamentals
 - a) Estimating Effects and Coefficients.
 - b) Significance Plots.
 - c) Estimating Error.
 - d) Extending Designs.
 - e) Power of Design.
 - f) Lack of Fit.
 - g) Tests for Surface Curvature.
- 24. ANALYZE: Design Selection
 - a) Desirable Designs.
 - b) Performance.
 - (i) Balance.
 - (ii) Orthogonality.
 - (iii) Resolution.
 - c) Other Design Models.
 - (i) Saturated Designs.
 - (ii) Plackett Burman Designs.
 - (iii) Johns 3/4 Designs.
 - (iv) Central Composite Designs.
 - (v) Box Behnken Designs.
 - (vi) Taguchi Designs (mention).
- 25. ANALYZE: Transforms
 - a) Need for Transformations.
 - b) Non-Constant Variance.
 - c) Box-Cox Transforms.
 - d) Calculated Parameters.
 - e) Taguchi Signal to Noise Ratios.
- 26. IMPROVE: Tools
 - a) Improve Stage Objectives.
 - b) Tools to Prioritize Improvement Opportunities.
 - c) Tools to Define New Process Flow.
 - (i) Lean Tools to reduce NVA and Achieve Flow.
 - d) Tools to Define & Mitigate Failure Modes.
 - (i) PDPC.
 - (ii) FMECA.
 - (iii) Preventing Failures.
 - e) Reference to Tools for Defining New Process Levels.

27. IMPROVE: Response Surface Analysis
 - a) Objectives.
 - b) Applications.
 - c) Sequential Technique.
 - d) Steepest Ascent.
28. IMPROVE: Ridge Analysis
 - a) Graphical Method.
 - b) Analytical Method.
 - c) Overlaid Contours.
 - d) Desirability Function.
29. IMPROVE: Simulations
 - a) Applications.
 - b) Examples.
 - c) Applying Probabilistic Estimates.
30. IMPROVE: Evolutionary Operation
 - a) Methodology.
 - b) Example.
 - c) Risks & Advantages.
31. CONTROL: Tools
 - a) Control Stage Objectives.
 - b) Control Plans.
 - c) Training.
 - d) Measuring Improvement.
32. CONTROL: Serial Correlation
 - a) Applications.
 - b) Estimating Autocorrelation.
 - c) Interpreting Autocorrelation.
 - d) Batch Control Charts.
33. Design for Six Sigma Overview
 - a) Methodology.
 - b) Tools for DFSS.
 - c) System, Parameter and Tolerance Designs.