

IEE Black Belt Curriculum Content

Enterprise DMAIC (extension of standard DMAIC tools)

- Defining the business purpose and metrics
- Measuring high level business performance
- Analyzing the high level business performance
- Identification of optimal improvement efforts
- Implementing controls to maintain business performance.

Project Define

- Improved project definition statements
- Working with Business leadership on project selection
- Planning the project schedule and participation

Project Measure

- Identifying primary metric performance (predictability and capability)
 - Control charting of business level metrics (high level outputs of continuous and attribute data)
 - Distribution analysis and transformations of data
 - Capability assessments (continuous and attributes)
 - Subgrouping concepts for better analysis and understanding.
- Identification of Quick Fix (Low Hanging Fruit) issues
- Process flow charting
 - High level charting
 - Detailed process charting
- Lean assessment tools
 - Value Stream Map
 - Spaghetti Diagrams
 - Combination work charts
 - Work Flow Analysis
 - Physical flow maps
 - Transaction flow analysis
 - 5S
 - General Lean concepts
 - Value added/ Non-value added analysis
 - Time Value mapping
 - Logic flow diagrams
 - Takt time analysis
 - Batch size analysis
- Theory of Constraints analysis.
- Data collection and sampling methods
- Measurement System Analysis
 - Attribute gauge analysis
 - Decision system analysis
 - Continuous gauge analysis
 - Calibration vs. MSA issues
 - Data validation and verification

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- Wisdom of the Organization
 - Process mapping
 - Brainstorming
 - Force Field Diagrams
 - Analytic Hierarchy Process (AHP)
 - Why-Why Diagrams (fault tree diagrams)
 - Nominal Voting Methods
 - Prioritization Matrixes (Cause and Effect Matrix)
 - Failure Modes and Effects Analysis (FMEA)

Project Analyze Phase

- Basic Statistics (t, z, F... testing)
 - Extensive Minitab charting techniques to for insight into performance data
 - Simple regression
 - Multiple regression
 - Simple one way Analysis of Variance (ANOVA) for comparing multiple groups
 - Multiple factor ANOVA
 - Analysis with mixed continuous and discrete terms (Regression and ANOVA methods)
 - Distribution analysis
 - Logistic regression (attribute or pass/fail response)
- Non-statistical (six sigma) methods to provide evidence of significance.

Project Improve Phase

- Tolerance Design testing
- Parameter Design testing
- Factorial and fractional factorial Design of Experiments (DOE)
- DOE for variation reduction
- DOE for data collection (as part of analyze effort)
- DOE for pass fail data and other extensions of methods
- Solution selection methods
- Lean improvement methods
 - Kaizen improvement events
 - 5S improvements
 - Future Value Stream Mapping
 - Visual controls
 - Cellular flow
 - Process flow improvement (pull, supermarkets, pace maker management)
 - Theory of Constraints improvements
 - Batch size improvement validation
 - Kanban implementation
 - Heijunka Box methods
 - Flow leveling (balancing)
 - Constraint analysis
- Improvement plan development
- TRIZ method for innovation

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- Reliability analysis
 - Repairable systems
 - Non-Repairable Systems
 - Generic method to deal with missing data.
- Total Productive Maintenance (TPM) issues

Project Control Phase

- Control Plan development
 - Documentation and deployment issues
 - Reaction plans
 - Continuous performance assessment methods
 - Support group participation
 - FMEA usage
- Implementation planning
- Deployment of improvement
- Leveraging gains across organization
- Archiving and report generation

Soft Skills

- Presentation skills
- Team Facilitation methods
- Team development using the Orming Model
- Creativity in measure phase and improve phase topics
- Change management