



*Project Title*

Green/Black Belt:

Champion:

Location: (your location)

Date:

# *Problem Statement & Objective* **D***MAIC*

- What is wrong; where it happened; when it occurred; to what extent and I know that because...
- Improve [metric] from [baseline] to [goal] by [when]

*The project objective should be:*

**S**pecific

**M**easurable

**A**ggressive yet Achievable

**R**elevant

**T**ime-bound

- Six Sigma Project Leader
- Champion
- Process Owner
- Finance rep
- Six Sigma Mentor
- Other Project Team Members

- Dollar savings
  - Hard
  - Soft
- Non-financial benefits – “Value Tree Benefits”
  - Revenue Generation
  - Market Strategy
  - Customer Responsiveness & Communication
  - For the Customer
  - On-Time Accurate & Complete Deliverables
  - Marketplace Competitiveness
  - Product / Service / Source Performance
  - Information Accuracy
  - Warranty & Concessions

- Primary Metrics
  - DPU, Z-score, % defective...
- Consequential metric(s)
  - *Metric to measure possible unintended consequences of process changes*



Metric Chart

# *SIPOC/Macro Process Map*

**D**MAIC

SIPOC/Macro Process Map connects the customer to the process and helps identify the key inputs and requirements

- Suppliers Inputs Process Steps Outputs Customers



SIPOC

***Process Map Conclusions***

- Conclusions
- Next Steps
- Barriers

***Define Phase Key Take-Away***

The Detailed Process Map provides a visual representation of the steps in a process. A detailed process map is used because it:

- Gives everyone a clear understanding of the process and the boundaries of the project
- Helps to identify rework and other non-value-added operations
- Is an input to the Cause & Effect Matrix

***Process Map Conclusions***



# *Define Data Collection Systems* **DM**AIC

- What data being collected, what system, who collects, what time period collect for, etc.

A measurement system will not willingly disclose the inaccuracies transmitting to our data. We must actively look for the bias in the measurement system

- Attribute R&R
- Variable R&R

(Paste results from Excel or Minitab)

***MSA Conclusions***

Understand Current Process Capability in terms of DPU, DPMO, Probability of a defect, or Z-Score

Enter Minitab output from your capability analysis

***Capability Conclusions***

- Conclusions
- Next Steps
- Barriers

***Measure Phase Key Take-Away***

# Cause & Effect

The Cause & Effect Diagram is a team brainstorming tool to identify all possible root causes.

Benefit: Team agrees on possible causes to pursue

Common Categories:

- manpower, methods, materials, machinery and environment (manufacturing)
- equipment, policies, procedures, and people (administration and service).

*Suggest: Visio > Flowchart folder > Cause and Effect Diagram*

**Cause & Effect Conclusions**

# *Failure Modes & Effects Analysis* **DMAIC**

The FMEA is a structured approach to identify ways in which a process can fail to meet the customer CTQs, estimate the risk, evaluate current controls plans, and determine improvement actions necessary.



FMEA Forms

*\* Include FMEA in Analyze or Improve or both*

***FMEA Conclusions***

Graphically show from data, where root causes of problems occur

Enter Minitab output from your graphical techniques: box plots, dot plots, main effects, multi-vari, etc.

***Graphical Analysis Conclusions***

Statistically show from data, where root causes of problems occur

Enter Minitab output from your hypothesis testing (remember the Roadmap!) by highlighting the text and doing a copy/paste.



Hypothesis Testing  
Roadmap

***Statistical Analysis Conclusions***



# *Analyze Phase Conclusions*

***DMAIC***

- Conclusions
- Next Steps
- Barriers

***Analyze Phase Key Take-Away***

# Significant X's and Potential Solutions **DMAIC**

<i>Root Cause</i>	<i>Solution</i>

\* *Solutions should consider Lean Techniques, error proofing, standard process, etc.*

**Use Pugh Matrix or other tool to evaluate Alternative Solutions – State Conclusions**

- Use FMEA or other Risk Analysis tool to identify possible risks of implementing solution



FMEA Form

***Risk Analysis Conclusions***

The New Detailed Process Map provides a visual representation of the new process. It should show how non-value added steps have been eliminated, and the opportunities for defects reduced.

***New Process Map Conclusions***

# *Improve Phase Conclusions*

***DMAIC***

- Conclusions
- Next Steps
- Barriers

***Improve Phase Key Take-Away***

- The new process capability should show the actual % improvement.

***New Process Capability Conclusions***

- Document process, develop control plan, use SPC, error proof and/or standardize procedure



Control Plan



MFG Control Plan

- Conclusions:
  
  
  
  
  
  
  
  
  
  
- Opportunities for leveraging:

***Control Phase Key Take-Away***