



Management Consultant

Six Sigma  
Training course  
synopsis & Outline

**6 $\sigma$**  *the way to believe*

**Presented by**  
**EFR Management Consultant**  
(JM0451327-U)

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# *Welcome to EFR Training*

With a warm welcomes, it is our pleasure to share the knowledge with you.

EFR offers a wide selection of comprehensive courses and training solutions to support continual improvement in productivity and quality that impact on business performance included customized course to suit your esteem organization needs. EFR also work closely with local universities, National Productivity Corporation and other major education and training provider to enhance the knowledge provide to you. Courses are designed to be stimulating and enjoyable, and we hope that this course meets with your expectations.

EFR was founded by renowned consultant Mr. Edly Ferdin Ramly which conducted various high impact, quality, productivity, occupational health and safety and environmental training and consultation for various organization. *EFR management consultant* offers expert resources for quality & productivity improvement through training, consultancy, publication and audio video production. Currently, the focus of EFR in consultancy and training while the research for publications and audio video productions are still ongoing.

For consultancy, EFR provide the most efficient way to certify to various management system certification i.e. ISO9001, ISO14001, OHSAS. EFR also work as associate for many other organizations and EFR also work closely with major certification body.

In Malaysia EFR shared best practice and EFR understand the local culture very well and all the EFR services are adaptable to local customer needs, cultures and customs. EFR look forward to share the world class best practice with you.

If you have any enquiries regarding us, please contact us via email [enquiries@efrmanagement.com](mailto:enquiries@efrmanagement.com), website [www.efrmanagement.com](http://www.efrmanagement.com) or fax to 07-5980594. Alternatively, you can directly contact me on 012-7748331. Enjoyed and Excel with us.

Thank you

*Edly Ferdin Ramly*

Principal Trainer and Consultant

● Excellence ● Forward ● Resourceful ●

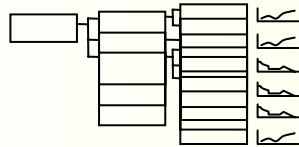
# 6σ Roadmap

*the way to believe*



*Recognize*

**Create Master Improvement Plan**



**Focus**



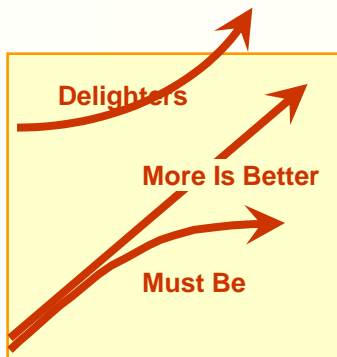
**Project Selection & Project agreement**



**SIPOC**

**VOC**

**CTQ**



*Measure*



*Data Measure*

**Data Collection Plan**

**Data Verification**

**Data Verification & Process Capabilities**

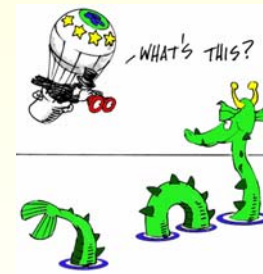
*Process Physical Measure*

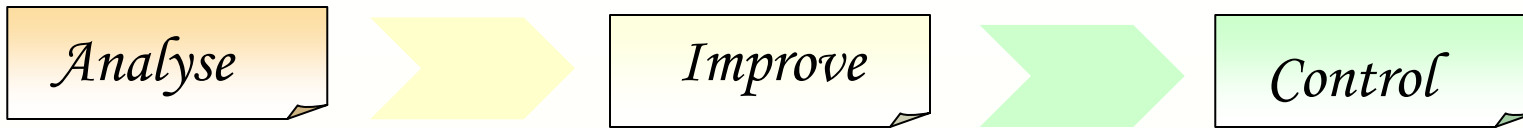
**Value Stream Map**

**Process Map**

**Value Analysis Matrix**

**Result Display**





**Recognize causes**



**Cause and Effect**



**Causes validation**

**Breakthrough  
Benchmark  
Re- Engineer**



**Cost Benefit  
analysis**



**Risk Assessment**

**Process Change  
Management**



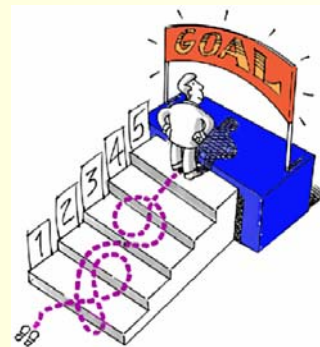
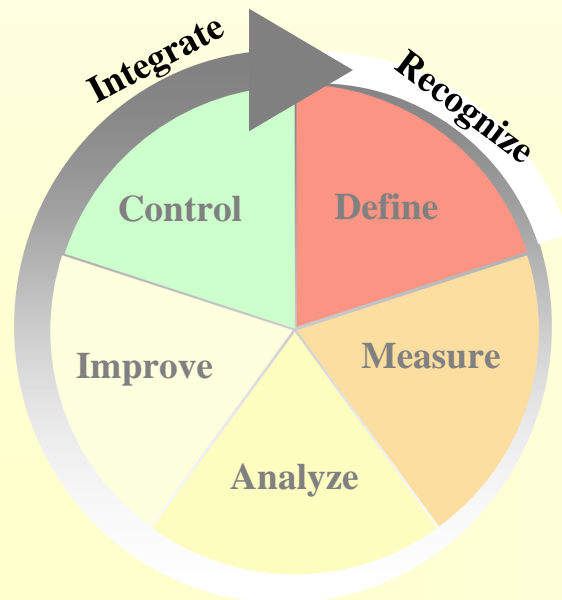
**Documentation**



**Multiply Gains**



**Future Plan & Recommendation**



# Tools in Six Sigma



Tool name	*2-days course	Process Improvement					Product Development	
		Define	Measure	Analyze	Improve	Control	Core development process	Core application Process
Affinity Diagram	/	/		/			/	/
Agreement/ Charter		/		/	/		/	/
APQP								/
Brainstorming		/		/	/		/	/
Business Case	/	/						
Cause & Effect diagram	/	/		/			/	/
Consensus	/				/			
Control Plan			/	/	/	/		/
Control Chart								
I-chart	/		/	/	/	/		
X bar R			/	/	/	/		
p, np			/	/	/	/		
c, u			/	/	/	/		
Cost-benefit analysis					/		/	/
CTQ (Critical to Quality)	/	/					/	/
Data collection			/	/	/	/		
Design of Experiment				/	/			
Full Factorial				/	/			
Reduced Fraction				/	/			
Screening				/	/			
More than two level				/	/			
Response Surface Methodology				/	/			
Flow diagram	/	/	/	/	/	/		/
Frequency Plot			/	/	/			
FMEA			/		/			
DFMEA							/	/
PFMEA			/		/			
Gage R&R			/					
Hyphothesis test				/			/	/
t-test				/			/	/
Paired t-test				/			/	/
ANOVA				/			/	/
Chi Square				/			/	/
Kano Model	/	/					/	/
Modelling							/	/
Multi-generation Product plan							/	
Planning tools					/		/	/
Pareto	/	/	/	/	/			

Tool name	*2-days course	Process Improvement					Product Development	
		Define	Measure	Analyze	Improve	Control	Core development process	Core application Process
Prioritization matrix			/		/		/	/
Process Capability	/	/	/			/		/
Process Mapping	/		/	/	/			/
Process Sigma	/	/	/		/			
DPMO	/	/	/		/	/		
Pugh selection Method							/	/
QFD (Quality Function Deployment)		/	/				/	/
Quality Control Process Chart						/		
Regression				/				
Reliability testing & analysis (Weibull)							/	/
Rolled Throughput Yield	/	/	/		/	/		/
Sampling			/	/	/	/		
Scatter plots				/				
Simulation							/	/
SIPOC	/	/						
Stakeholder analysis		/			/			
Standardization	/					/		
Stratification			/	/	/	/		
Stratified Frequency Plots				/				
Time series Plot			/					
Triz							/	
Tolerance stack analysis							/	/
Value Analysis Matrix	/		/					
Value Stream Map			/					
VOC		/						

\* 2 days six sigma introduction/ champion training focus on the relationship of the tools in DMAIC. Theory and application in tools are focus in SSGB or SSBB course.

# Green Belt & Black Belt Week 1

## Week 1 Day 1

Introduction 01\_Agenda

Why Six Sigma 02\_Why Six Sigma-19

DMAIC Overview 03\_DMAICOV-10

Break

Define Overview 04\_BusCase-21

Define: Charter 04\_BusCase-21

1. Case study (Read & develop Charter)

Lunch

Define: SIPOC 05\_SIPOC-13

Define: VOC and CTQ 06\_VOC-20

2. VOC + SIPOC + CTQs using Case Study

Break

Define Review 06\_VOC-20

Measure Overview 07a\_DataColl-39

Data Collection (Intro, Id Meas.) 07a\_DatColl-39

3. Case Study (Cause & Effect Diagram)

Presentations

Plus and Delta

## Week 1 Day 2

Introduction, Plus and Delta Review

Data Collection: Basic Stats 07a\_DatColl-39

Minitab 07b\_Minitab-12

4. Case Study - Basic Stats

Break

Data Collection: Stratification 07c\_DatColl-13

Data Collection: Operational Definition 07c\_DatColl-13

Sampling 08\_Sampling-21

Lunch

MSA (Continuous measures) 09\_MSValidation-32

MSA(Cont. measures;Rubber band exer.) 09\_MSValidation-32

Break

Measurement System Val. (Att measures) 09\_MSValidation-32

MSA (Attribute measures - M&M exercise) 09\_MSValidation-32

5. Case Study - MSA

Presentations

Plus and Delta

## Week 1 Day 3

Introduction, Plus and Delta Review

Patterns in data (Time plots/Control Charts) 10a\_PatDat-60

Patterns in data (Freq. Plots, Pareto Charts) 10b\_PatDat-43

Break

6. Case Study - Data display

Process Capability - Normality, Probabilities, Sigma Method 1&2, Cp/CpK 11\_ProcCap-68

Lunch

7. Case Study - Process Capability

Measure Review 11\_ProcCap-68

Analyze Overview 12\_ProcDataDoor-26

Break

Process Door vs. Data Door 12\_ProcDataDoor-26

8. Case Study - Fishbone,

Organizing causes 13\_Organize Causes-12

Presentations

DMAIC Review 14\_DMAICForward-5

Project Documentation 15\_ProjDoc-13

# Green Belt & Black Belt Week 2

## Week2 Day 1

Introduction

Week 1 Review

Break

Hypothesis Testing (Overview, t-test)

Break

9. Case Study - F-test and T-test

Lunch

Hypothesis Testing (ANOVA)

10. Case Study - ANOVA

Break

Hypothesis Testing (Chi-Sq)

11. Case Study - Chi-square

Hypothesis Testing (Review)

Presentations

Plus and Delta

## Week2 Day2

Introduction, Plus and Delta Review

Regression Analysis 05\_Regression

Break

12. Case Study - Regression Analysis

Break

Design of Experiments (intro) 06ab\_DOE

Lunch

Presentations

Break

Analyze Review 07\_RevAnalyze

Presentations

Plus and Delta

Improve Overview 08\_ImproveOV

Generate, Evaluate, Select Solutions 09\_GenEvalSelectSol

13. Case Study - G/E/S Solutions

Plus Delta

## Week2 Day3

Introduction, Plus and Delta Review

Managing Risk

Implement Solutions

Improve Review

Break

Control Overview

Process Management and Change Control

Standardization and Documentation

Standardization Exercise w/ airplane

Lunch

Monitoring (Intro, Individuals Charts)

Break

Monitoring (X-bar, R Charts; Overview discrete Control charts) (w/case study)

14. Case Study - Monitor Results

Evaluate Results

Key Learning Points

Control Review

15. DMAIC Review - Case Study Evaluate Results

Deliverables

DFSS

Plus and Delta/Wrap-up/eval's

DFSS

Break

DMAIC Review

# Black Belt Week 3

## Week3 Day1

Expectations, Introductions and Agenda  
Bridge to Black Belt  
Review Define  
Review Measure  
Lunch  
Presentation Skills  
Gage R&R and Linearity  
Wrap-up, Plus/Delta

## Week3 Day2

Introduction  
Review Analyze  
Multi-Vari Studies  
Normal Theory  
Lunch  
Testing For Normality  
Transforming Data  
Wrap-up, Plus/Delta

## Week3 Day3

Introduction  
Review Hypothesis Testing  
Hypothesis Testing  
ANOVA  
Lunch  
Hypothesis Testing (cont'd)  
Power Analysis  
Wrap-up, Plus/Delta

## Week 3 Day 4

Introduction  
Review Regression  
Regression  
Lunch  
Regression  
Wrap-up, Plus/Delta

# Black Belt Week 4

## Week 4 Day 1

Introductions  
Review Week 1 and Bridge to Black Belt  
Review DoE  
Lunch  
DoE  
Wrap-up, Plus/Delta

## Week 4 Day 2

Introduction  
Response Surface Methodology (RSM)  
Lunch  
RSM  
Review Innovative Improvement  
Review Control  
Wrap-up, Plus/Delta

## Week 4 Day 3

Introduction  
Control Charts  
Lunch  
Control Charts  
Reliability  
Wrap-up, Plus/Delta

## Week 4 Day 4

Introduction  
Reliability  
DMAIC Case Study  
Lunch  
DMAIC Case Study  
Wrap-up, Plus/Delta

## Week 4 Day 5

Introduction  
DMAIC Case Study  
Exam  
Wrap- Up, Graduation, Evaluation