Quality Guideline

European Six Sigma Club – Deutschland e.V.

Education

Six Sigma Green Belt

Minimum Requirements

Training

Valid: May 2015

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Background

Origin

 In March 2008 the Executive Board of the European Six Sigma Club - Germany eV put together a list of training content detailing the minimum requirements for a Six Sigma Green Belt Training.

As a result, a quality standard was developed together with the club membership.. During a conference in November 2008 in Kassel the contents were finally clarified and subsequently approved.

Modification

In comparison to the edition from 28.08.2012 the following changes have been made:

a) New Club design
b)   New logos incorporated onto cover sheet
c) Table of contents
d) Text revised + new sections added
e) Chapter 3: Duration of training defined more precisely
f)   Chapter 3: Minimum participation time for certificate issuance defined
g) Chapter 4: Revised headlines and acronyms
h) Chapter 4: Content "Analyse" expanded to include the topics "Correlation analysis" and "Simple linear and non-linear regression"
i) Chapter 5: Scope and objectives (profundity of material) of the individual subjects supplemented

Earlier editions

Edition from 14.12.2008
Edition from 15.08.2011
Edition from 28.08.2012

Acronyms

6S	Six Sigma
ANOVA	Analysis of Variance
BB	Black Belt
C&E	Cause and Effect
DMAIC	Define – Measure – Analyse – Improve – Control
ESSC-D	European Six Sigma Club Deutschland e.V.
GB	Green Belt
MBB	Master Black Belt
SIPOC	Supplier – Input – Process – Output - Control
SMBB	Senior Master Black Belt
VOC	Voice of Customer

Terms

Quality Guideline	Policy to ensure the desired quality results
Sponsor	In general, a member of the middle management. Supports Project Manager and team in the execution of the tasks.
Guideline	A statement or other indication of policy or procedure by which to determine a course of action
Policy	A plan or course of action, as of a government, political party, or business, intended to influence and determine decisions, actions, and other matters
Standard	A standard is a document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose.

1. Scope

The guideline describes the minimum requirements on the training content to become a Six Sigma Green Belt. The nature, extent and profundity of the course material are described according to set classifications. This is used for comparison with existing or newly developed training.

The fulfilment of the criteria described below is the basic prerequisite for the certification of experts as Six Sigma Green Belt according to the guideline established by European Six Sigma Club Deutschland e.V.

2. Introduction

The following guideline is now broken down into project phases and in a general part, which however does not mean that the tools need to be trained in the specified phase.

Since many tools can be used in several phases, it is the responsibility of the trainer to teach the content according to the applied didactics at the appropriate time.

3. Duration of training

The teaching contents to become a Six Sigma Green Belt are described. To achieve the required profundity of training, at least 8 days of classes, with at least 80 lessons (each 45 minutes plus breaks) are necessary.

10 days of classroom instruction is typical with a total of 100 lessons (each 45 minutes plus breaks).

In the case of Institutions of Higher Education, it is permissible that the required profundity of material can be imparted by dividing the lessons between lecture attendance time and self-study. The maximum proportion of self-study allowed is 25% of the total teaching time. For the above described standard training (80 lessons) the possible self-study proportion is 20 lessons. The self-study part is less efficient compared to lecture time. A factor of 3 is typical to calculate the real number of lessons. So the described standard training can be divided in 60 lessons of attendance time and 60 lessons self-study time.

In order to receive a certificate of attendance participants have to be present for at least 85% of the total training time.

3. Training content

3.1.   General

- Six Sigma basics and history
- DMAIC Methodology
- Basics of Project Management

3.2.   DEFINE

- Project Charter
- SIPOC
- VOC (Voice of Customer)

3.3.   MEASURE

- Basic statistics (mean, median, range, standard deviation, variance, proportion)
- Histogram
- Boxplot
- Run chart (time series plot)
- Control chart (I chart and X bar / R chart)
- Pareto diagram
- Multi-vari-chart (main effects and interaction)
- Scatterplot
- Matrix plot
- Flow charting techniques
- Output-/Input collection
- Ishikawa-diagram (C&E diagram)
- Cause & Effect-matrix
- Data collection plan
- Measurement system analysis (continuous and attribute data)
- Distribution identification (e.g. Normality test)

- Process capability (continuous data, short term/long term)
- Sigma level calculation

3.4. ANALYSE

- Confidence interval
- Test for equal variance (two or more samples)
- t-test (two samples)
- ANOVA (one way or one factor)
- Chi-square test

3.5. IMPROVE

- Brainstorming
- Decision matrix
- FMEA (risks of improvement action)
- Implementation plan
- Data analysis of pilot improvement run
- Process capability of pilot improvement run

3.6. CONTROL

- Data analysis of improvement (before/after)
- Hypothesis tests of improvement (before/after)
- Process capability of improvement (before/after)
- Individual chart (I chart)
- X bar/R or X bar/s chart
- Control plan
- Project report and summary (incl. standardization)
- Best practice report and lessons learned

4. Scope and objectives of the subjects

The above-defined topics, methods and tools describe the minimum content for a Six Sigma Green Belt training course. In this section, the scope and objectives of these topics are specified based on classification criteria. The training course has to fulfil the prescribed requirements stipulated in the guideline according to the defined classification or higher.

4.1. Key for classification

4.1.1. Classification for the scope (instruction)

Class	Description
A	Method was explained
B	Method was applied together
C	Method was practiced alone or in team
D	Method was practiced incl. feedback to the exercise

4.1.2. Classification of objectives

Class	Description
1	The participant has understood the principle of using
2	"1" plus - participant can select and apply the tool
3	„2" plus - participant is able to interpret important results
4	"3" plus - participant knows the calculation background in detail
5	"4" plus - participant can calculate results by hand

4.2. Classification for Six Sigma Green Belt Training

Thema	Phase	Instruction	Objective
Six Sigma basics and history	K	A	1
DMAIC methodology	K	A	1
Basics of Project Management	K	A	2
Project charter	D	D	2
SIPOC	D	D	2
VOC (Voice of Customer)	D	A	1
Basic statistics (mean, median, range, standard deviation, variance, proportion)	M	C	5
Histogram	M	C	3
Boxplot	M	C	4
Run chart / Time series plot	M	C	3
Control Charts (I Chart and Xbar / R chart)	M	C	3
Pareto diagram	M	C	4
Multivari-chart (main effect and interaction)	M	C	5
Scatterplot	M	C	4
Matrix plot	M	C	3
Flow chart	M	C	3
Output-/Input collection	M	D	3
Ishikawa-diagram (C&E diagram)	M	B	3
Cause & Effect-matrix	M	B	5
Data collection plan	M	C	2
Measurement system analysis (continuous and attribute data)	M	D	3
Distribution identification (e.g. Normality test)	M	D	3
Process capability (continuous data)	M	C	3
Sigma level calculation	M	B	3
Confidence interval	A	C	3

	A	C	3
t-test (two samples)	A	C	3
ANOVA (one way or one factor)	A	B	3
Chi-square test	A	B	3
Brainstorming	I	B	2
Decision matrix	I	A	3
FMEA (risks of improvement action)	I	A	2
Implementation plan	I	A	2
Data analysis of pilot improvement run	I	A	3
Process capability of pilot improvement run	I	A	3
Data analysis of improvement (before/after)	C	A	3
Hypothesis tests of improvement (before/after)	C	C	3
Process capability of improvement (before/after)	C	B	3
Individual chart (I chart)	C	B	3
x bar/R chart or x bar/s chart	C	B	3
Control plan	C	A	2
Project report and summary (incl. standardization)	C	A	2
Best practice report and lessons learned	C	A	2