Quality Guideline

Training Program

Six Sigma Master Black Belt
Training

European
Six Sigma Club Deutschland e.V.
www.sixsigmaclub.de

Version: 1.1

Status: 23/09/2021

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Descriptive statistics			
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Analysis of variance (simple)			
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Chi Square / Proportion test			
Simple linear regression			
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Fractional factorial DOE			
Co-variables			
Response Surface Methodology			
Multi-vari analysis			
Multiple regression			
Tolerance chains analysis			
Monte Carlo			
Control strategy			
SPC			
Others			
Sum of competencies	0	0	0
Min 216 of 290 (75%)	min 3	min 25*2	min 23*3

Foreword

Background

The Master Black Belt (MBB) is the highest level of training in the Six Sigma programme. The tasks that can be performed by an MBB are diverse and very extensive.

He can be deployed as a coordinator and coach for Six Sigma activities (champion) or he can lead extensive and complex projects.

Other tasks may include training employees to become Green Belts, Black Belts or in the area of Design for Six Sigma (DFSS).

In addition to all organisational and training activities, the further development of the Six Sigma methodology is an additional task of a Master Black Belt.

These comprehensive and responsible activities of an MBB require solid and equally demanding training.

With this Quality Guideline, the European Six Sigma Club Deutschland e.V. creates the basis for training at a high level.

This guideline is binding for all companies that refer to Six Sigma Master Black Belt training in their tenders, training courses and/or certifications in accordance with the ESSC-D statutes.

The present guideline was developed between 2007 and 2009. It was based on the discussions, workshops and presentations at the European conferences in Madrid in 2003 and Lisbon in 2004.

Many experienced Master Black Belts who were and are active in the various functions described above have contributed their knowledge to the guideline. The most important stages in the development of this guideline were

- ESSC-D conference in Heltersberg - March 2007
- Workshop at the ESSC-D conference in Bielefeld - March 2008
- ESSC-D retreat - June 2008
- Discussion and feedback in the ESSC-D WIKI - August 2008 - June 2009
- Release at the ESSC-D retreat - June 2009

On behalf of the European Six Sigma Club Deutschland e.V., we would like to thank all those who have contributed to the development of this Quality Guideline for the training of Six Sigma Master Black Belts.

The Board of Directors

Changes

The following changes have been made to the version dated 28th August 2012:

a) Adaptation of the document layout to the new design
b) Addition of data mining advanced course (recommended additional training).

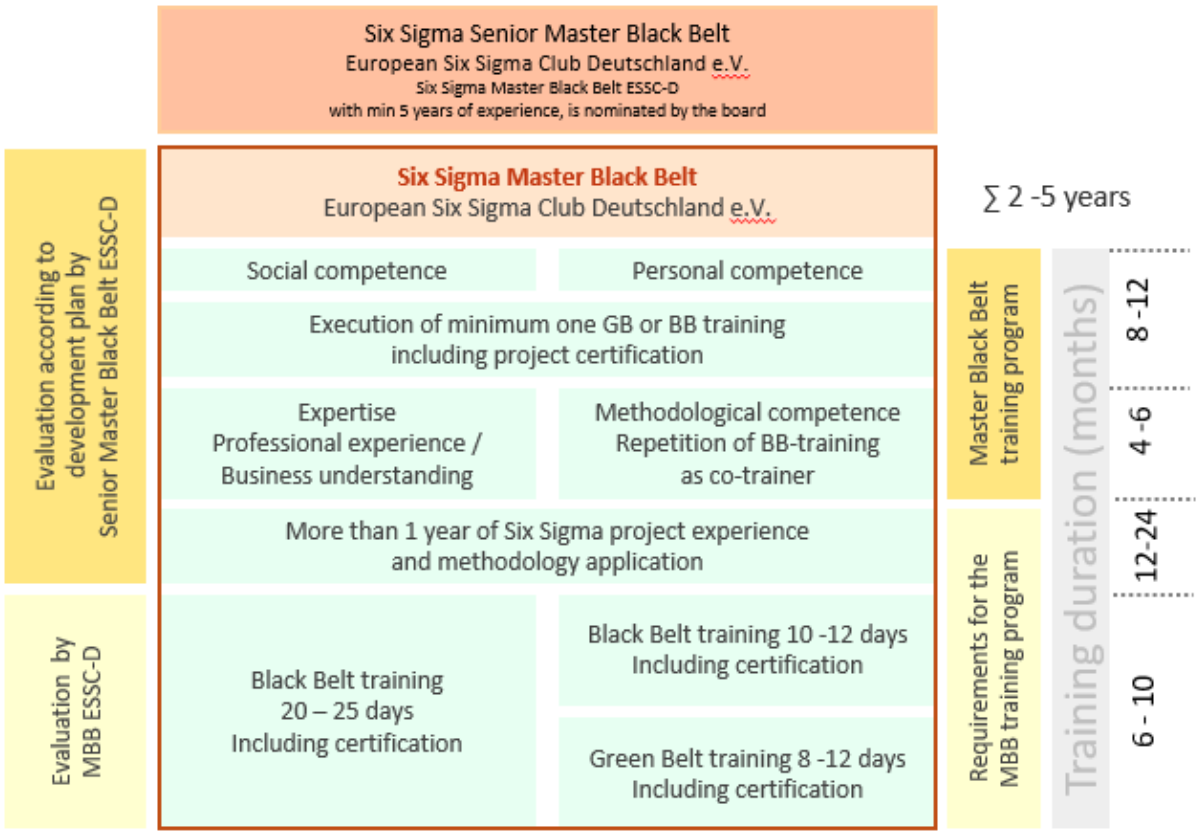
Previous editions

Version from August 28th, 2012

Version from August 15th, 2011

Version from November 15th, 2009

1 Graphical summary of the minimum requirements



2 General information

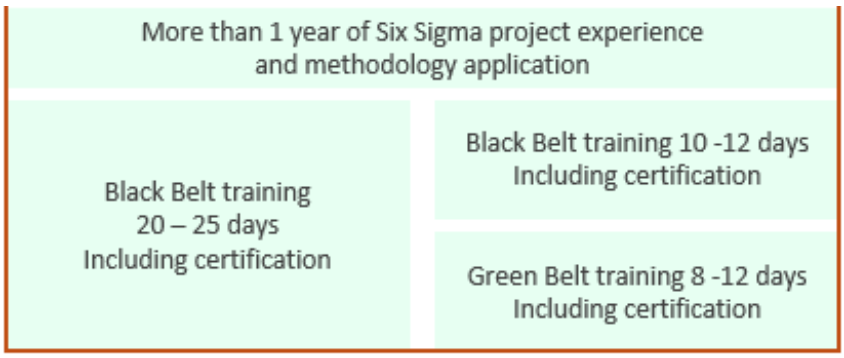
The Master Black Belt training is supervised by a "Six Sigma Master Black Belt ESSC-D", the certification is carried out by a "Six Sigma Senior Master Black Belt ESSC-D". A Senior Master Black Belt ESSC-D performs the Master Black Belt function for a minimum of 5 years and has successfully supervised more than 10 Black Belts up to certification and is appointed by the ESSC-D Board.

The supervising Master Black Belt is responsible for the creation and evaluation of the individual Master Black Belt development plan. This consists of the following points, which must be planned and assessed by him:

- Prerequisites for Master Black Belt training
- Methodological competence
- Expertise, professional experience, business understanding
- Personal and social skills
- Assessment and certification

Certification is based on the ESSC-D assessment table for the certification of a Master Black Belt.

3 Requirements for the Master Black Belt training program



The prospective Master Black Belt must be able to provide evidence of recognised training as a Black Belt, including successful certification in accordance with the *"**ESSC-D Black Belt certification criteria".***

See below "Details about the Black Belt Toolbox" and "Evaluation of the Black Belt Tools" (requirements/tool list for Black Belt training).

He must also have at least 1-2 years of professional experience as a Black Belt.

In addition, further practical application of the Six Sigma method is expected and must be demonstrated by suitable means. The application of the tools must be checked and evaluated by the Master Black Belt.

3.1 Methodological competence

The prospective Master Black Belt should acquire and demonstrate good methodological competence during a training course for Six Sigma Black Belts as co-trainer. The following minimum requirements are used as criteria for the assessment:

3.1.1 Details on methodological competence

- Good knowledge of applied statistics and quality tools
- Knowledge transfer, explanations of the methodological and statistical tools in training and project work
- In-depth knowledge of the approach taken in other improvement initiatives (Kaizen, Lean, CIP, TPM, etc.) and how these differ from and interact with Six Sigma
- Analysing and evaluating large amounts of data
- Think in terms of "processes" and the systems in which they work
- Ability to successfully introduce and implement Six Sigma methods
- Expertise in the Black Belt toolbox (concept/interaction) and in statistical and methodological tools that complement or extend it

In addition, the implementation of the DMAIC cycle using the Six Sigma method is evaluated.

3.1.2 Details about the Black Belt Toolbox in the DMAIC phases

- DEFINE:
  Determine the right project scope
  Determine the potential success and benefits

- MEASURE:
  Make sure that the measurements correlate well with the objective and that the amount of information is sufficient for the next steps

- ANALYZE:
  Extracting the information from the data to determine the connections
  Effective use of the right methodological tools and statistical analysis

- IMPROVE:
  Describing the logical relationships and analysing alternatives for improvement

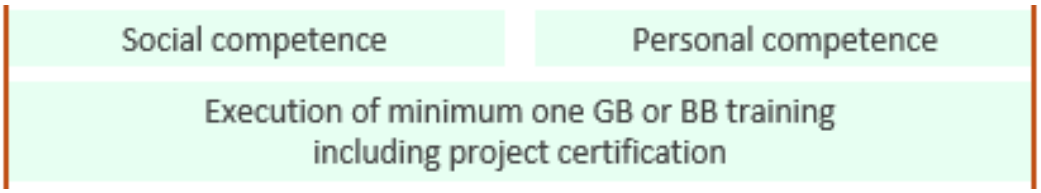
- CONTROL:
  Use creative control mechanisms to maintain improvements (ensure sustainability)
  Push for standardisation and elimination of unreasonable control efforts from the past

3.2 Expertise, professional experience, business understanding

The Master Black Belt should have competences in the areas of customer orientation, process knowledge and business understanding. The following minimum requirements are used as criteria for the assessment:

- Search for opportunities to increase efficiency
- Viewing workflows and processes from the customer's perspective in particular
- Knowledge of process management and own processes, as well as the value chain
- Pro-active identification of opportunities to better fulfil customer needs
- Experience in solving customer problems (internal and external customers)
- Business knowledge (accounting, profit and loss calculation, ...)

3.3 Personal competence



The following minimum requirements are used as criteria for assessment:

- The prospective Master Black Belt should have the trust and acceptance of management and employees
- Necessary competence and reliability even in uncertain situations
- Achievement of the plan targets and taking the responsibility for the results
- Translating strategy into tactics
- Flexible handling of changes
- Systematic handling of problems
- Setting priorities and working through issues in the project according to urgency
- Making decisions based on thorough analysis
- Recognising limitations and barriers, finding ways around them
- Set and achieve ambitious goals
- Support project activities to be completed on schedule

3.4 Social competence

The Master Black Belt has the task of knowledge transfer. In terms of this task, he should be able to convey complex information in an understandable way.

The prospective Master Black Belt should independently conduct a Green Belt or Black Belt training course, including project support and certification.

The evaluation of the effectiveness of the training is based on feedback from the participants and the supervising Master Black Belt. The following minimum requirements are used as criteria for the evaluation:

- Recognising people's knowledge and building on it
- Creatively deepen and further develop training content
- Conveying technical information to non-technicians as well
- Creating a pleasant learning atmosphere and convincing knowledge transfer
- Active listening and questioning to check understanding
- Encouraging participants to think and participate
- Coordinating Six Sigma activities
- Mentoring and/or coaching of Black Belts and managers
- Effective moderation of discussions
- Managing conflicts on the way to understanding differences and using data and tools to reach agreement
- Providing direction and focus the team on success factors
- Creating an environment that inspires and motivates the team to achieve results
- Recognising the need for individual or group help required to take the next steps
- Assessing situations and recognizing current feelings
- Delegating without personnel responsibility (without disciplinary dependency)
- Encouraging open dialogue between customers, suppliers and the team to learn from and with each other

4 Evaluation according to development plan

(By Senior Master Black Belt ESSC-D)

The assessment by the Senior MBB documents the tool application of the MBB candidates. The following competence areas are assessed:

- Professional (development plan, project work),
- Personal (development plan, project work and coaching, co-trainer),
- Social and (development plan, project work and coaching, co-trainer),
- Methodological (development plan, project work and coaching, co-trainer, tool application).

4.1 Assessment of the Black Belt Tools

BB Six Sigma Tools	Tool understanding (1-4 see legend)	Training experience GB-YB (0-2)	BB Tool application (0-4)
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4.2 Assessment of the Advanced Tools

Master Black Belt Candidate Competence Evaluation (Advanced Tools)					
MBB Six Sigma Tools	**In development plan? Y/N**	**Tool understanding (1-4)**	**Training experience BB-GB (0-2)**	**Tool application (0-4)**	**Total expertise (1-10)**
Analysis Tools					
Multiple regression					
General Linear Models					
Data distributions					
Statistical tolerance analysis					
Data transformation					
Auto- & Cross-correlation					
Test for medians					
Advanced DOE					
Experimental design strategy					
Response Surface Methodology					
Taguchi/Robust Design & Noise					
Constrained random order					
Variance components					
DOE models and diagnosis					
Experiments with Covariables					
Incomplete DOE (evaluation)					
Lean Manufactoring					
Chemical processes					
Multi-vari data analysis					
Multivariate Data Process Control					
iGrafx or other simulation methodologies					
Mixture- and RSM designs					
Development area					
Tolerances					
Reliability					
Scorecard / Sigma calculation					
Simulations					
Quality Function Deployment					
Administration area					
Measurement systems					
Logistic regression					
iGrafx or other simulation methodologies					
Transformations					
Sales area					
Quantitative surveys					
Multi-vari data analysis					
Segmentation, Cluster analysis					
Conjoint analysis					
Production					
Examples of application					
Total competencies					

5 Recommended additional qualification

In addition to our social environment, digitalisation is also changing the way we communicate and work. The key benefit of digitalisation does not lie in the increase in convenience and efficiency, the improved use of resources, environmental protection or process optimisation. Rather, it lies in the enormous gain in transparency and data, which makes it possible to initiate and automate the process of learning and continuous improvement and take it to a new level.

The opportunities and challenges arising from digitalisation have long since found their way into Six Sigma. Not only is more data from an increasing number of sources of varying quality available in an ever-shorter time, but the possibilities for process optimisation and control have also increased. The ESSC-D working group "Six Sigma Thinking Ahead" has gathered well-founded cross-industry experience, put the Six Sigma toolbox to the test and added essential tools for the future-proof belt and all those interested in quality management in the age of digitalisation and big data.

These include, among others:

- Different project management methods
- Preparation of structured and unstructured data as well as large amounts of data
- Visualisation options for complex data structures
- Common methods of data science (or data mining)
- Possibilities and limits of artificial intelligence (AI) and machine learning (ML)
- Application and utilisation of developed correlation models

Further information and recommended training depths can be found in detail here:
https://www.sixsigmaclub.de/download/ESSCD_QualityGuideLine_DM_Aufbaukurs_DE.pdf

"Learning is like rowing against the current. If you stop, you drift backwards."
(Laozi, Chinese philosopher, 6th century BC)