



ORANGE BELT

LEAN SIX SIGMA

SKILL SET

LEAN & SIX SIGMA ORANGE BELT SKILL SET

A GUIDELINE FOR
TRAINING AND CERTIFICATION

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A guideline for training and certification

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INTRODUCTION

Within the domain of Lean and Six Sigma individuals can be trained and certified at different levels. The levels are listed in the Table below.

Belt level	Level
Lean Yellow Belt	Awareness
Lean Six Sigma Yellow Belt	Awareness
Lean Six Sigma Orange Belt	Foundation
Lean Green Belt	Practitioner
Lean Six Sigma Green Belt	Practitioner
Lean Black Belt	Expert
Lean Six Sigma Black Belt	Expert
Master Black Belt	Master

Table 1 - Overview of Lean Six Sigma Belt levels

The LSSA - Lean Six Sigma Academy® was established in September 2009 with the objective to develop an international recognized certification scheme for all Lean and Six Sigma Belt levels. For each level the LSSA Exam Board has developed Skill sets with clear criteria for skills and competences. These Skill sets specify which of the overall Lean and Six Sigma techniques are expected to be included within certain Belt level competencies.

The LSSA Orange Belt Skill sets describe the assessment criteria for the theoretical exam. The Orange Belt certification can be achieved independently. There are no pre-requisites for certification and therefore does not require any prior completion of any other Belt. After completion of the Lean Six Sigma Orange Belt you can subscribe for the Lean Six Sigma Green Belt scheme.

Lean Six Sigma training is provided by a global network of ‘Accredited Training Organizations’ (ATOs). These ATOs provide training programs that are aligned to the LSSA Skill sets. Examination is provided through the LSSA directly or through APM Group Limited. The exams are open to all. Individuals can apply directly or sign up via one of the ATOs. It is recommended that candidates receive training through an ATO to prepare for certification. Check the LSSA website for an overview of ATOs and the actual exam requirements. On the website you will also find information about how you can claim your Digital badge. Then share your Digital badge on LinkedIn and show that you are active as an Orange Belt.



Figure 1 – Digital badge

THEORETICAL ASSESSMENT CRITERIA

The assessment criteria for the theoretical exam are as follows:

- The theoretical exam consists of 50 multiple choice questions.
 - The duration of the exam is 90 minutes.
 - The pass mark for the exams is set at 63% (32 marks or more required to pass).
 - The exam is Open book, where a maximum of 2 books are allowed.
 - A calculator is allowed.
 - You must be able to identify yourself with photographic ID.
 - There is no practical exam (only for Green and Black Belt certification).
-

CONTINUOUS IMPROVEMENT MATURITY MODEL (CIMM)

CIMM summarizes best practices and techniques of different methodologies in one framework, for different stages of maturity. The CIMM framework describes five consecutive stages: Creating a solid foundation, Creating a continuous improvement culture, Creating stable and predictable processes, Creating capable processes and Creating future-proof processes. Within Lean only the first three levels apply. For Six Sigma all five levels apply.

For each instrumental technique in the CIMM framework, it is possible to indicate the associated desired behavior. The CIMM framework identifies a number of behaviors for each improvement technique, which helps determine whether or not the implementation of the technology in question will be a success and results in a lasting impact.

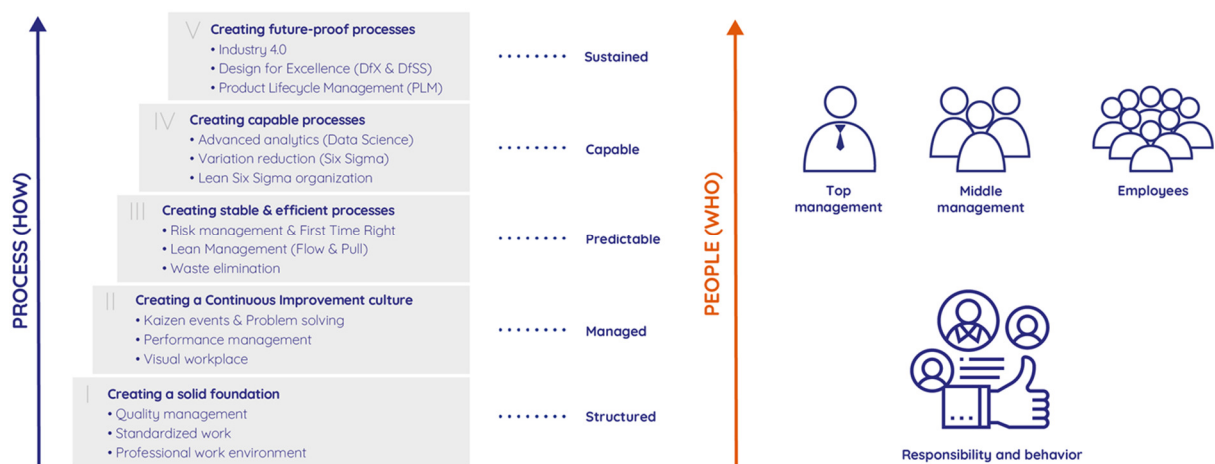


Figure 2 – CIMM Process (HOW) and People (WHO)

The following chapters describe the theoretical skill set elements. The structure consists of a number of 'Units', 'Elements' and 'Performance Criteria'.

- **Unit:** The skill set areas are called 'Unit'. The chapters in the book 'Climbing the Mountain' reflect the 'Units' described in this skill set.
- **Element:** Each 'Unit' consists of a number of 'Elements'. The sections]in each chapter of the book 'Climbing the Mountain' reflect the 'Elements' in this skill set.
- **Performance Criteria:** Each 'Element' consists of a number of 'Performance Criteria' and each 'Performance Criteria' has an explanation. These describe the tools, techniques and competencies that are required to be achieved by the Belt. A 'Cognitive Level' has been assigned to each 'Performance Criteria' according to Bloom's Taxonomy [Appendix A].

U1. WORLD CLASS PERFORMANCE

The Unit 'World Class Performance' reviews the general philosophy of continuous improvement. It discusses the overview of different process improvement methods and the history of the most important methodologies. It also explains why continuous improvement is important.

E1. CONTINUOUS IMPROVEMENT

The Learning Element 'Continuous Improvement' reviews the history, values and principles of the most common process improvement methodologies. Also, the culture within a continuous improvement organization as well as roles and responsibilities are reviewed.

U1.E1.PC1	Continuous Improvement history Recall the origins of quality management, Kaizen, Lean and Six Sigma.	Remember
U1.E1.PC2	Continuous Improvement values and principles Understand that Lean philosophy and principles realize improvements in process lead times and efficiencies.	Understand
U1.E1.PC3	Continuous Improvement Maturity Model Understand the different maturity levels of process management as described in the Continuous Improvement Maturity Model.	Understand
U1.E1.PC4	Continuous Improvement roles and responsibilities Understand the various continuous improvement roles and responsibilities.	Understand

E2. CUSTOMER VALUE (VOC & CTQ)

The Learning Element 'Customer first' reviews customer identification (internal/external), customer requirements and the CTQ-measure.

U1.E2.PC1	Voice of the Customer (VOC) Understand the Voice of the Customer (VOC). Understand that different customers have different needs, expectations, requirements and desires.	Understand
U1.E2.PC2	Critical to Quality (CTQ) Understand that Voice of the customer requirements need to be translated into CTQ targets and specifications.	Understand

U2. POLICY DEVELOPMENT AND DEPLOYMENT

The Unit 'Policy development and deployment' reviews how policy development and deployment help organizations in defining a continuous improvement strategy and to run efficiently in achieving their objectives.

E1. POLICY DEVELOPMENT

The Learning Element 'Policy development' explains the importance of a so-called True North and how to develop an operational excellence strategy.

- | | | |
|------------------|---|-------------------|
| U2.E1.PC1 | Vision & True North
Understand the meaning and importance of the organization's True North. Understand the meaning of Operational Excellence. | Understand |
| U2.E1.PC2 | Transformation roadmap
Understand the meaning of a transition roadmap for implementing continuous improvement. | Understand |
| U2.E1.PC3 | Performance and financial metrics
Understand the cost of poor quality (COPQ) metric. | Understand |

E2. POLICY DEPLOYMENT

The Learning Element 'Policy deployment' is focusing on the execution process of the improvement strategy. Within this element financial and performance metrics will be reviewed.

- | | | |
|------------------|--|-----------------|
| U2.E2.PC1 | Management of change
Recall that an organization's culture can influence the success of Lean Six Sigma deployment. | Remember |
|------------------|--|-----------------|

U3. PROJECT MANAGEMENT

The Unit 'Project Management' outlines the way improvement projects should be executed. A number of process improvement roadmaps is reviewed. The Unit also reviews project selection.

E1. MANAGING A PROJECT

The Learning Element 'Managing a project' reviews how to set up, plan and execute a project.

U3.E1.PC1	Project selection Understand the process of project selection.	Understand
U3.E1.PC2	Project charter Prepare a problem statement in relation to customer requirements or complaints.	Apply

E2. PROCESS IMPROVEMENT ROADMAPS

The Learning Element 'Process Improvement Roadmaps' reviews a number of roadmaps, including PDCA and DMAIC.

U3.E2.PC1	Kaizen roadmap (PDCA) Understand project management methods that are used at the shop floor for Kaizen initiatives (e.g. PDCA, A3-report).	Understand
U3.E2.PC2	Lean Six Sigma Roadmap (DMAIC) Understand and follow the DMAIC roadmap.	Understand
U3.E2.PC3	Problem Solving Process (8D) Understand and be familiar with the problem-solving process (e.g. 8D approach).	Understand

U4. CREATING A SOLID FOUNDATION

The Unit 'Creating a solid foundation' reviews how to achieve a solid foundation for further process improvement programs. This foundation consists of a proper and organized work environment and standardized work.

E1. PROFESSIONAL WORK ENVIRONMENT

The Learning Element 'Professional work environment' is about good housekeeping and how to set up a proper and safe work environment in a structured manner.

U4.E1.PC1 Organized work environment (5S) Apply
Organize the work environment by applying 5S (Sort, Straighten, Shine, Standardize, Sustain). Understand that an organized environment will improve safety and moral.

E2. STANDARDIZED WORK

The Learning Element 'Standardized work' is about implementing and improving standards and protocols.

U4.E2.PC1 Standard Work Understand
Understand that standardized tasks are the foundation for continuous improvement. Interpret standard operating procedures (SOPs) and one-point-lessons.

U4.E2.PC2 Training Within Industry Understand
Understand the basic principles of Training Within Industry.

E3. QUALITY MANAGEMENT

The Learning Element 'Quality Management' is about developing procedures to identify and detect defects. Also preventing mistakes and avoiding problems is part of this element.

U4.E3.PC1 Quality Management System Understand
Understand the basic principles of Training Within Industry.

U5. LEVEL II – CREATING A CONTINUOUS IMPROVEMENT CULTURE

The Unit 'Creating a continuous improvement culture' reviews how to create a continuous improvement culture at the shop floor. This Unit reviews setting up Kaizen teams. It also reviews a number of problem-solving techniques and tools.

E1. VISUAL MANAGEMENT

The Learning Element 'Visual management' reviews how to set up a workplace that is organized and self-explaining.

U5.E1.PC1 Visual workplace Apply
Apply elements of Visual Workplace and understand how these can help to control the improved process.

E2. PERFORMANCE MANAGEMENT

The Learning Element 'Performance management' reviews how to set targets, and how to organize the work to be done. The Learning Element also reviews how to facilitate improvement teams at the shopfloor that work on Kaizen improvement initiatives and Problem Solving.

U5.E2.PC1 Daily stand-up meetings Apply
Participate in stand-up meetings and Scrum sessions.

U5.E2.PC2 Kaizen events and problem solving Apply
Describe and understand the importance of the Kaizen principles. Participate in Kaizen events and continuous improvement initiatives. Apply root cause analysis and understand the issues involved in identifying a root cause.

E3. BASIC QUALITY TOOLS

The Learning Element 'Basic quality tools' reviews techniques to visualize data and guidelines how to facilitate and participate in brainstorm sessions.

U5.E3.PC1 Brainstorm techniques Apply
Apply brainstorm techniques: affinity diagram, 5-Why's and Ishikawa.

U5.E3.PC2 Visualization of data Apply
Apply basic quality tools to visualize data: Scatter plot, Pareto chart, Bar chart, Pie chart, Time Series Plot, Histogram and Box plot.

U6. LEVEL III – CREATING STABLE AND EFFICIENT PROCESSES

The Unit 'Creating stable and efficient processes' reviews how the logistical flow of processes can be improved and made more stable, predictable and efficient. This Unit reviews tools which can be used to visualize and analyze the process flow as well as a number of tools and techniques that can be used to improve efficiency, effectiveness, productivity and agility of processes. All Level III Learning Elements and Performance Criteria follow the DMAIC structure.

DEFINE

E1. PROCESS MAPPING

The Learning Element 'Process Mapping' reviews a number of tools to map and analyze the flow of a process.

- | | | |
|------------------|--|-------------------|
| U6.E1.PC1 | High-level process description | Understand |
| | Participate by identifying input and output process variables and be familiar with SIPOC technique. | |
| U6.E1.PC2 | Process Flow diagram | Understand |
| | Participate in process mapping initiatives to visualize the flow of activities and decisions within a process. | |

MEASURE

E2. PERFORMANCE METRICS

The Learning Element 'Performance management' reviews performance metrics for both logistics as for quality.

- | | | |
|------------------|--|-------------------|
| U6.E2.PC1 | Performance metrics (Time) | Understand |
| | Understand performance metrics related to time (e.g. takt time, cycle time, lead time, queue time, WIP, yield and OEE). Understand Little's law. | |
| U6.E2.PC2 | Performance metrics (Quality) | Understand |
| | Understand performance metrics related to quality (e.g. PPM, DPMO, DPU and RTY). Understand the difference between a defect and a defective. | |

E3. BASIC STATISTICS

The Learning Element 'Basic statistics' reviews different types of data, measurement scales and data collection tools. Also a set of measures (statistics) that characterizes a given set of data are reviewed.

- | | | |
|------------------|---|-------------------|
| U6.E3.PC1 | Data types and Measurement scales
Understand the difference between quantitative and qualitative data. Understand the difference between continuous (variables) and discrete (attributes) data. | Understand |
| U6.E3.PC2 | Data collection tools
Apply tools for collecting data such as data sheets and check sheets. | Apply |
| U6.E3.PC3 | Descriptive statistics
Understand the basic terms of statistics e.g. proportion, mean, standard deviation and range. | Understand |

ANALYZE

E4. VALUE STREAM ANALYSIS

The Learning Element 'Value Stream Analysis' reviews how to create a Value Stream Map of the current situation.

- | | | |
|------------------|---|-------------------|
| U6.E4.PC1 | Value adding versus Non-value adding
Understand the difference between value adding and non-value adding activities. | Understand |
| U6.E4.PC2 | Value Stream Mapping (Current State)
Understand that Value Stream Mapping is a technique for identifying waste and non-value adding activities. | Understand |

IMPROVE

E5. REDUCING MUDA (WASTE)

The Learning Element 'Reducing Muda' reviews how to identify and eliminate Waste in the organization and its processes.

- | | | |
|------------------|--|--------------|
| U6.E5.PC1 | Waste identification
Identify and eliminate process Waste (Muda): Overproduction, Waiting, Transport, Overprocessing, Inventory, Movement, Defects and Unused expertise. | Apply |
|------------------|--|--------------|

E6. REDUCING MURI (OVERBURDEN)

The Learning Element 'Reducing Muri' reviews how to identify overburden in the organization. This element also reviews how to implement flow and work balancing to reduce overburden.

- | | | |
|------------------|--|-------------------|
| U6.E6.PC1 | Flow
Understand the meaning of Flow. | Understand |
| U6.E6.PC2 | Work balancing
Understand the meaning of Work balancing. | Understand |

E7. REDUCING MURA (UNEVENNESS)

The Learning Element 'Reducing Mura' reviews how to identify unevenness in the organization and its processes. This element also reviews a number of techniques to reduce unevenness.

- | | | |
|------------------|--|-------------------|
| U6.E7.PC1 | Pull
Understand the meaning of Pull. | Understand |
| U6.E7.PC2 | Volume and Type leveling
Understand basic principles of volume leveling, type leveling and one piece flow. | Understand |

E8. VALUE STREAM IMPROVEMENT

The Learning Element 'Value Stream Improvement' reviews how the techniques and tools that reduce Muda, Muri and Mura can be applied in constructing a Future State Value Stream Map.

- | | | |
|------------------|--|-------------------|
| U6.E8.PC1 | Value Stream Mapping (Future State)
Understand the difference between current state and future state Value Stream Mapping. | Understand |
|------------------|--|-------------------|

CONTROL

E9. PROCESS AND QUALITY CONTROL

The Learning Element 'Process and Quality control' looks at how results that have been achieved in process improvement projects can be sustained. This element reviews the following techniques and principles: Process FMEA, Control plan, Jidoka and Poka Yoke.

- | | | |
|------------------|---|-------------------|
| U6.E9.PC1 | First Time Right (FTR)
Understand the importance of First Time Right principles. Understand the work has to be stopped when there is a quality problem (Jidoka). Identify opportunities to apply Poka Yoke to avoid quality problems. | Understand |
| U6.E9.PC2 | Process FMEA (pFMEA)
Understand the purpose and elements of Process FMEA, including the risk priority number (RPN) and describe FMEA results for processes. | Understand |
| U6.E9.PC3 | Control plan
Participate in developing a control plan to document and hold gains and assist in implementing controls and monitoring systems. | Understand |

E10. TOTAL PRODUCTIVE MAINTENANCE (TPM)

The Learning Element 'Total Productive Maintenance' reviews the coherence between reliable systems and equipment and continuous improvement.

- | | | |
|-------------------|--|-------------------|
| U6.E10.PC1 | TPM principles
Understand the eight pillars of TPM and understand how it can be used within process improvement. | Understand |
|-------------------|--|-------------------|

SIX SIGMA ORANGE BELT SKILL SET

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U7. LEVEL IV – CREATING CAPABLE PROCESSES

The Unit 'Creating Capable Processes' focuses on reducing variation in a stable process with the objective to create a process capable of meeting customer requirements. This Unit reviews the application of Six Sigma and statistical tools used to assure a valid and reliable performance measurement system, to collect data and to analyze the performance of processes. Six Sigma focuses on quality breakthrough improvement projects. All Level IV Learning Elements and Performance Criteria follow the DMAIC structure.

MEASURE

E1. STATISTICAL TECHNIQUES

The Learning Element 'Statistical techniques' reviews a number of metrics that are often used in Six Sigma projects. The element also reviews a number of sampling methods for assuring data accuracy and integrity.

- | | | |
|------------------|--|-------------------|
| U7.E1.PC1 | Variation
Understand the difference between special cause and common cause variation. | Understand |
| U7.E1.PC2 | Sampling
Understand it is important to follow systematic data collection. Understand the basic terms of statistics e.g. mean and spread. | Understand |

E2. DISTRIBUTIONS

The Learning Element 'Distributions' reviews a number of continuous and discrete distributions. The element also reviews the central limit theorem and a number of probability concepts.

- | | | |
|------------------|--|-------------------|
| U7.E2.PC1 | Continuous distributions
Understand and interpret Normal distribution. | Understand |
|------------------|--|-------------------|

E3. MEASUREMENT SYSTEMS

The Learning Element 'Measurement Systems' reviews how to evaluate measurement systems.

- | | | |
|------------------|---|-------------------|
| U7.E3.PC1 | Measurement systems analysis
Understand the basic principles of performing a Measurement System analysis. Understand the difference between repeatability and reproducibility (R&R) and the meaning of the number of distinct categories. | Understand |
|------------------|---|-------------------|

ANALYZE

E4. HYPOTHESIS TESTING & CONFIDENCE INTERVALS

The Learning Element 'Tests for means, variances and proportions' reviews the basic principles of hypothesis testing.

U7.E4.PC1	Hypothesis testing Under the basic principles of hypothesis testing.	Understand
U7.E4.PC2	Confidence intervals Understand the basic principles of confidence intervals.	Understand

E5. TESTS FOR MEANS, VARIANCES AND PROPORTIONS

The Learning Element 'Tests for means, variances and proportions' reviews the most common hypothesis tests to investigate the difference between population means (μ).

U7.E5.PC1	Tests for means Understand the basic principles of hypothesis testing.	Understand
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E6. CORRELATION AND REGRESSION

The Learning Element 'Correlation and Regression' describes the predictive models using regression techniques to determine the relation between factors on a response.

U7.E6.PC1	Correlation coefficient Interpret the correlation coefficient.	Understand
U7.E6.PC2	Regression analysis Apply linear regression to understand the relationship between factors and response.	Apply

E7. PROCESS CAPABILITY AND PERFORMANCE

The Learning Element 'Process Capability and Performance' explains process capability and performance in relation to specification limits.

U7.E7.PC1	Process Capability (Cpk) Understand basic principles of process capability studies. Understand the importance of stability in process capability studies.	Understand
U7.E7.PC2	Short-term and long-term capability Understand the difference between long-term and short-term capability.	Understand

IMPROVE

E8. DESIGN OF EXPERIMENTS (DOE)

The Learning Element 'Design of Experiments' reviews efficient ways of experimenting. Design of Experiments examines the influence of factors and interactions on a process.

U7.E8.PC1 **Principles and terminology** **Understand**
Understand the importance of efficient ways of experimenting.

CONTROL

E9. STATISTICAL PROCESS CONTROL (SPC)

The Learning Element 'Statistical Process Control' explains the controls methods used to identify out-of-control situations and deviations over time. Different types of SPC charts are reviewed.

U7.E9.PC1 **Control charts** **Understand**
Understand the usefulness of control charts such as Xbar-R.

APPENDIX A – BLOOM'S TAXONOMY FOR PERFORMANCE CRITERIA

In addition to specifying content, each performance criteria in this skill set also indicates the intended complexity level of the test questions for each topic. These levels are based on 'Levels of Cognition' (from Bloom's Taxonomy – Revised, 2001), and can be used to create learning outcomes for students.

The Taxonomy of Educational Objectives, often called Bloom's Taxonomy, is a classification of the different objectives that educators set for students (learning objectives). The taxonomy was proposed in 1956 by Benjamin Bloom, an educational psychologist at the University of Chicago. During the nineties, Lorin Anderson a former student of Bloom revisited the cognitive domain in the learning taxonomy. Bloom's Taxonomy divides educational objectives into three 'domains': Affective, Psychomotor and Cognitive. This Skill set only notices the Cognitive domain. The 'Levels of Cognition' are in rank order - from least complex to most complex. The Orange Belt skill set only uses the levels 'Remember', 'Understand' and 'Apply'.

Remember

Recall or recognize terms, definitions, facts, ideas, materials, patterns, sequences, methods, principles, etc. The LSSA uses the following verb at this level: Recall.

Understand

Read and understand descriptions, communications, reports, tables, diagrams, directions, regulations, etc. The LSSA uses the following verbs at this level: Describe, Follow, Identify, Interpret, Participate, Understand.

Apply

Know when and how to use ideas, procedures, methods, formulas, principles, theories, etc. The LSSA uses the following verbs at this level: Apply, Assess, Assure, Calculate, Convert, Define, Demonstrate, Divide, Eliminate, Empower, Facilitate, Implement, Motivate, Organize, Plan, Prepare, Present, Promote, Propagate, Review, Select, Standardize, Support, Use.

Analyze

Break down information into its constituent parts and recognize their relationship to one another and how they are organized; identify sublevel factors or salient data from a complex scenario. The LSSA uses the following verbs at this level: Analyze, Construct, Deploy, Design, Develop, Distinguish, Evaluate, Lead, Manage, Translate.

Evaluate

Make judgments about the value of proposed ideas, solutions, etc., by comparing the proposal to specific criteria or standards. The LSSA does not use this level in their skill sets.

Create

Put parts or elements together in such a way as to reveal a pattern or structure not clearly there before; identify which data or information from a complex set is appropriate to examine further or from which supported conclusions can be drawn. The LSSA does not use this level in their skill sets.

APPENDIX B – PRACTICAL PROJECT ASSESSMENT CRITERIA

Kaizen & Lean project criteria PDCA

Phase	Nr	Criteria
Plan	1	The project addresses a customer complaint, problem or business case.
	2	There is a clear problem definition.
	3	Objectives are clearly defined and are measurable.
	4	VOC and VOB are defined and specifications are clear.
	5	The scope of the project is clearly defined.
	6	The most important stakeholders have been identified.
	7	Relevant CTQ (s) have been selected and a CTQ flowdown has been made.
	8	A high level process description has been made (e.g. SIPOC).
	9	The reliability of the data has been investigated.
	10	Process performance has been constructed and assessed against specifications.
	11	A detailed process description has been made (e.g. VSM Current State).
	12	Potential causes have been identified.
	13	Analyzes have been used to identify factors of influence (e.g. Fishbone or FMEA).
	14	The main root causes have been identified and explained.
	15	Conclusions are clear and supported.
Do	1	Risks have been defined and addressed (e.g. pFMEA).
	2	The improved process meets the specifications of the VOC and VOB.
	3	There is a clear communication and action plan towards the stakeholders.
	4	The client has approved the improvement proposals.
Check	1	There is a proven improvement of the CTQ compared to the baseline measurement.
	2	Standards have been adjusted and documentation has been updated.
	3	Roles and responsibilities have been described.
	4	Employees are instructed and/or trained.
	5	It has been shown that the improvements are sustainable.
Act	1	It has been indicated how performance will be monitored in the future.
	2	Final report is ready and lessons learned have been communicated.
	3	Champion has indicated that objectives and/or savings have been achieved.

Table 2 - Project Practical Assessment PDCA

Lean en Six Sigma project criteria DMAIC

Phase	Nr	Criteria
Define	1	Project addresses a clear problem description or business opportunity.
	2	Problem description has been clearly defined.
	3	Goals have been clearly defined and are measurable.
	4	VOC and VOB have been clearly defined and requirements are understood.
	5	Scope of the project has been clearly delineated.
	6	Key stakeholders have been identified.
	7	Relevant CTQ(s) have been selected and a CTQ-flowdown has been constructed.
	8	High level process description has been made (e.g. SIPOC).
Measure	1	The collected data has been proven to be representative for the project.
	2	Validity of the data has been verified in an appropriate way.
	3	Historical data has been used to visualize process performance over time.
	4	Performance against requirements has been checked.
	5	Variation in the process has been considered (common cause or special cause).
	6	Short term versus long term performance has been considered.
Analyze	1	Process has been mapped in detail (e.g. VSM Current State).
	2	Potential factors of influence have been determined.
	3	Analysis have been used to identify factors with highest influence.
	4	Hypothesis for root cause has been defined properly.
	5	Input data has been collected and analyzed correctly.
	6	Graphical and statistical techniques have been applied to investigate root causes.
	7	Major root causes have been identified.
	8	Conclusions are clear and have demonstrated strong evidence/are statistically valid.
Improve	1	Risks have been identified and addressed (e.g. pFMEA).
	2	Improved process meets the requirements of the VOC and VOB.
	3	There is a clear communication and action plan towards the stakeholders.
	4	The client (Champion) has approved the improvement proposal.
	5	An improvement of the CTQ compared to the baseline is demonstrated.
Control	1	Standards are adjusted and documentation has been updated (pFMEA, CP).
	2	Rolls and responsibilities have been described.
	3	Employees are instructed and/or trained.
	4	Evidence of 'In-Control situation' is available and sufficient.
	5	Improvements have proven to be sustainable.
	6	Measures have been put in place to monitor process performance.
	7	Project report has been completed. Lessons learned have been communicated.
	8	Champion states that project targets and/or savings have been achieved.
	9	Champion or controller has signed off the project.

Table 3 - Project Practical Assessment DMAIC

A complex network diagram consisting of numerous small grey circular nodes connected by thin, light grey lines. The nodes are distributed across the upper half of the page, with a higher density in the center and more sparse connections towards the edges. The lines vary in length and orientation, creating a web-like structure.

LSSA
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