

## DEFINE

### Define the problem

#### Problem Statement



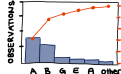
Precisely describe the problem

#### Project Charter



All important project information at a glance and up-to-date

#### Pareto



Smart project scoping - go for the 'big fish' (e.g. runner products, production lines with most downtimes, ...)

#### SIPOC



What's process is behind the problem? Can I solve the problem within this project scope?

#### Voice of the Customer



Understand what internal and external customers expect from the process

#### Business Case



What's the benefit of your organization from your project?

## MEASURE

### Measure the extent of the problem

#### Fishbone



Systematically identify potential causes

#### 5 x Why



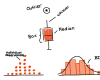
Getting deeper to the root cause

#### Process Map



Map the detailed process

#### Frequency plots



Analyze and understand your y-data

#### Probability plot



Is your data following the normal distribution?

#### Control Charts



Is the process stable / predictable?

#### Process Capability



How good does your process meet the specification?

#### Measurement System Analysis



Are my data reliable?

#### Data Collection Plan



Which data do I need to collect for my analysis?

#### Lean Metrics



Common metrics for characterizing processes

## ANALYZE

### Find and verify the root cause

#### Waste Analysis



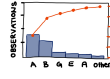
Identify waste in the process

#### Value Stream Mapping



Analyze the value stream from order to delivery

#### Pareto



Identify the vital defects / root causes (What are the 'big fish' causing my problem?)

#### Graphical Tools



Visualize potential cause-effect relationships, so you can investigate them afterwards

#### Hypothesis Testing

	2 Xs	> 2 Xs
$\mu$	2-sample T-Test	ANOVA
$\sigma$	F-Test for equal variances	
$\eta$	Shapiro-Wilk Test	Kruskal-Wallis Test
$\rho$	Chi-Square Test	Chi-Square Test

For discrete Xs: Identify the significant Xs

#### Linear Regression



For continuous X & Y: Identify the significant Xs

#### Design of Experiment



Find the root cause by systematic experimentation

## IMPROVE

### Find and implement a solution

#### Brainstorming



Collect creative solution ideas

#### Dogma Busting & Blue Sky



Challenge established paradigms and achieve self-reflexion

#### Risk Analysis



Analyze and mitigate potential risks of the solution

#### 5S



Create an efficient workplace

#### Standard Work



Define and train best practices

#### Poka Yoke



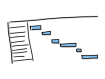
Make processes fail-safe

#### Visual Management



Visualize important metrics and information in an easy-to-understand manner

#### Implementation Plan



Planning the implementation of the solution

#### Agile



Develop and implement solutions iteratively

## CONTROL

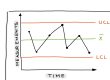
### Maintain the gains!

#### Hypothesis Testing

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Demonstrate the project achieved a significant process improvement (before / after)

#### Control Chart



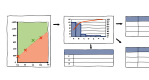
Monitor the process

#### PDCA



Continuously improve the process

#### Dashboard



Your visual control panel for monitoring key metrics and actions

#### RASCI



Clarify roles and responsibilities in processes (Responsible - Accountable - Supporting - Consulting - Informed)

