



Six Sigma + Lean Six Sigma

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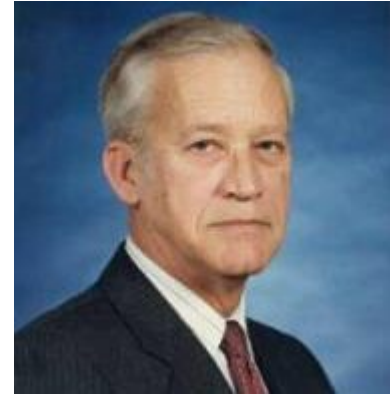
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Content of presentation

- History and definition of Six Sigma
- Six Sigma certification
- Six Sigma Belt Level Ranking
- Tools and Techniques of Six Sigma
- History and definition of Lean Six Sigma
- Tools and Techniques of Lean Sigma

History of Six sigma

- 1989 by engineer Bill Smith while working at Motorola (inspired by Japan's Kaizen model)
- 1990s Allied Signal, Honeywell and Ford adopted this methodology (Hayes 2024)



Honeywell

Definition of Six Sigma

Six Sigma

- set of techniques and tools for process improvement
- goal = improving the quality of processes, identifying and removing the causes of defects and minimizing variability in business processes
- term "Six Sigma" refers to a statistical measure of quality that indicates how far a process deviates from perfection

(Hayes 2024)

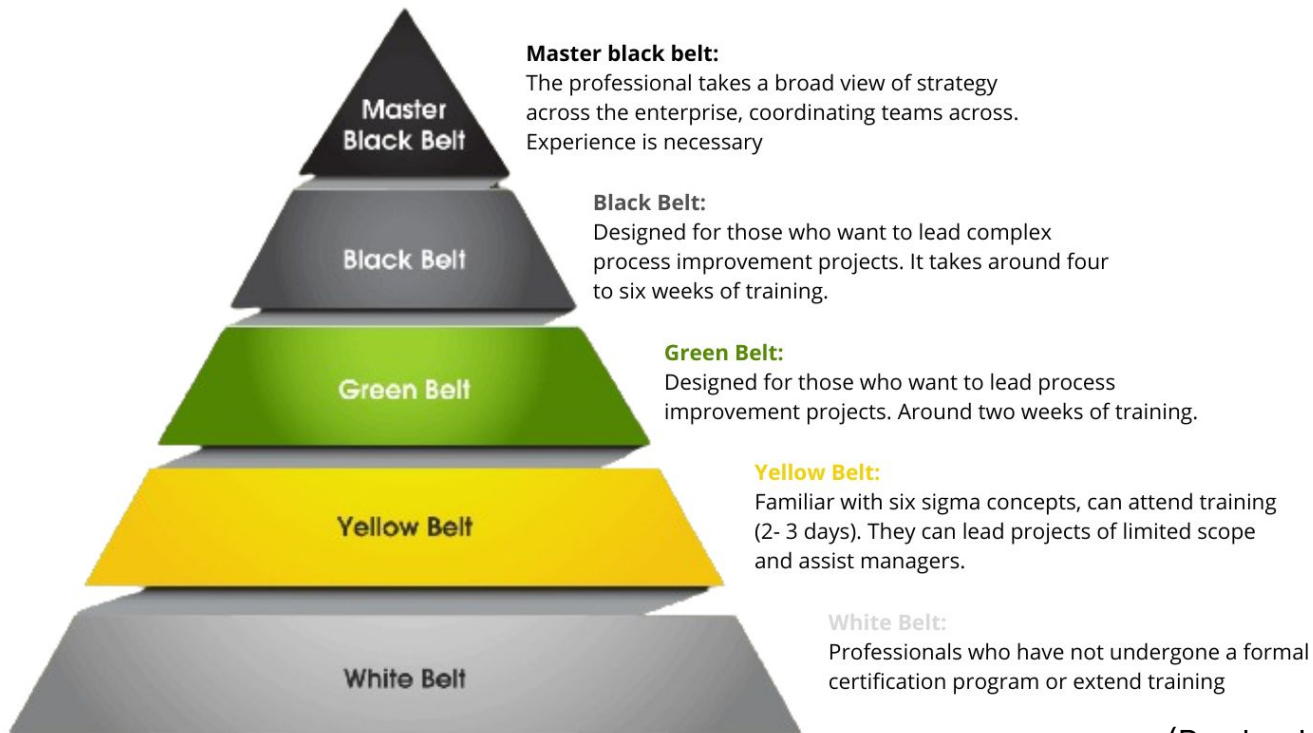
6σ

Six Sigma Certification

- professional credential that validates an individual's expertise in the principles, methodologies and tools
- demonstrates a deep understanding of statistical analysis, problem-solving techniques, and project management skills
- **Benefits:**
 - improved productivity
 - reduced cost
 - boost clients confidence
 - gain credibility and stakeholder trust

(SimpliLearn 2024)

Six Sigma Belt Level Ranking



Three key elements of six sigma

Customer

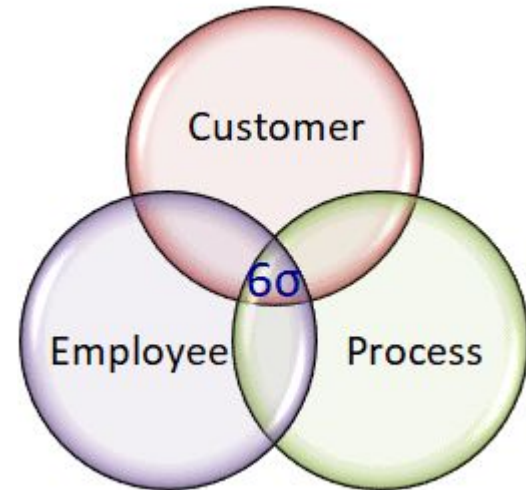
- Customers are the key to business (top priority)
- **Their expectations** → on-time delivery, high performance, great service
- meeting customer requirements is not enough in the business world

Process

- Defining the process is the key aspect of Six Sigma
- **Looking at the quality from customer's perspective** → this helps to identify the gaps in processes.

Employee

- Leadership commitment is important
- Involving all employees with their roles and clear objectives



Tools and Techniques of Six Sigma

- **DMAIC**

- structured problem-solving methodology
- data-driven process
- helps to think through a process and plan improvements
- followed in a strict sequence of five steps: (Hessing 2020)



Define



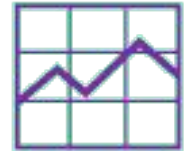
Measure



Analyze



Improve



Control

Five phases in the DMAIC method

Define

- Collate what we already know about the existing process.

Measure

- Collect further data about the existing process.

Analyze

- Identify the core problems that we'll address.

Improve

- Plan, test, and implement solutions.

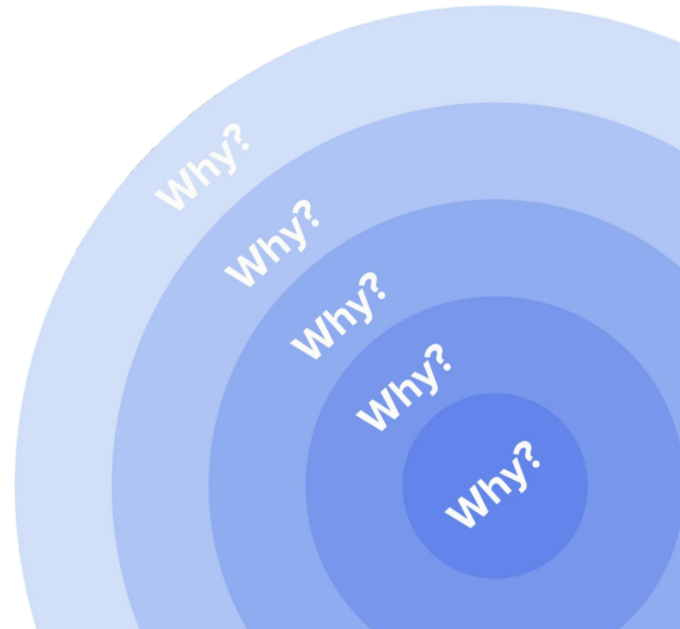
Control

- Set up supports to ensure that successful solutions are sustainable.
(Hessing 2020)

Tools and Techniques of Six Sigma

- **The 5 Whys**
 - developed by Sakichi Toyoda
 - primary goal is to determine the root cause of a defect or a problem
 - ask "why" five times
 - **Benefits:**
 - root cause of a problem
 - understand - process can cause a chain of problems
 - relationship between different root causes
 - effective without complicated evaluation techniques.

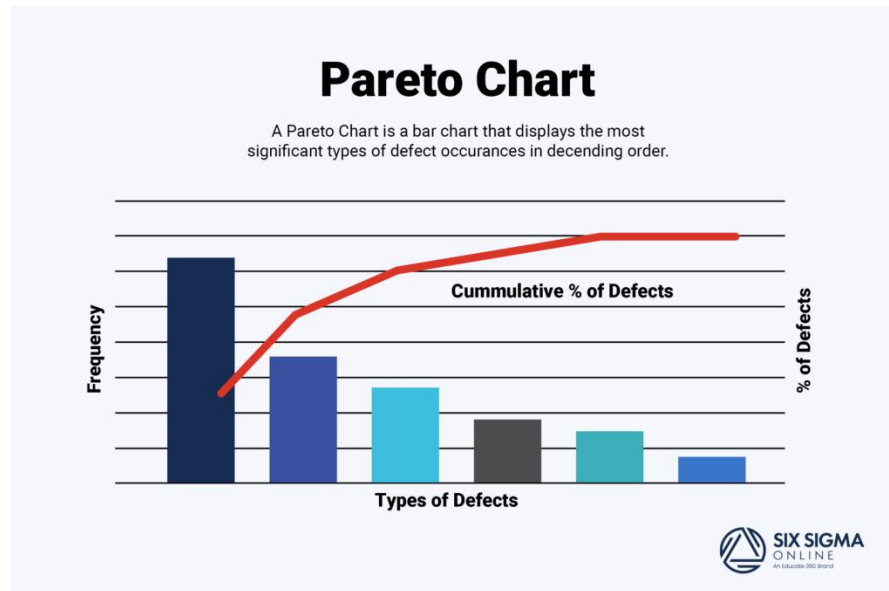
(Tulip 2024)



Tools and Techniques of Six Sigma

- **Pareto Chart**
 - graphical tool used to identify and prioritize the most significant factors contributing to a problem
 - The Pareto principle = 80/20 rule
 - 80% of effects come from 20% of causes

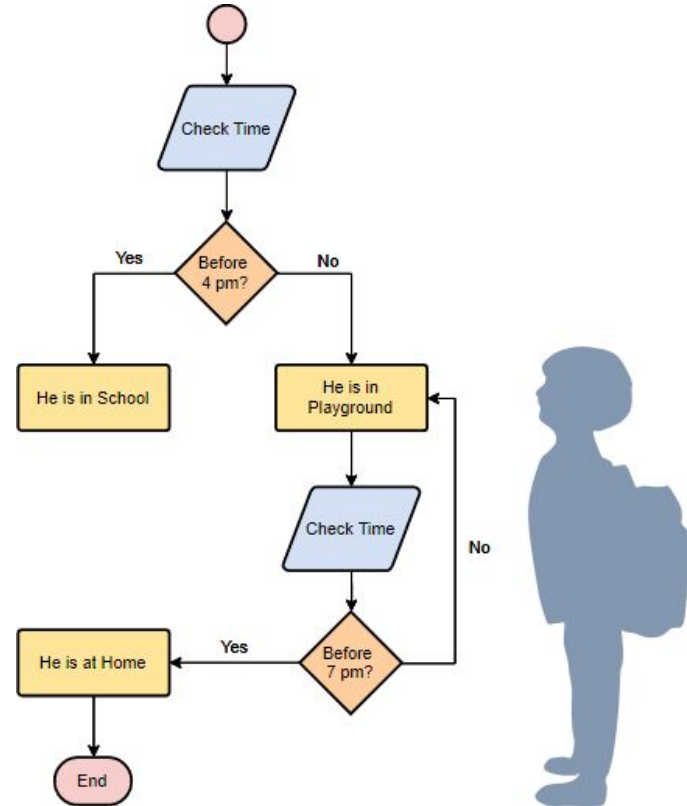
(Six Sigma Online 2024)



Tools and Techniques of Six Sigma

- **Process mapping**
 - Process mapping involves visually representing the process from start to finish
 - inputs, outputs, decision points, and interactions
 - primary goal is to identify areas of:
 - inefficiency, waste, or improvement

(More 2024)



Tools and Techniques of Six Sigma

- **RACI matrix**

- helps clarify roles and responsibilities within a project
- **Responsible** = do the work
- **Accountable** = make decisions
- **Consulted** = feedback, opinions
- **Informed** = keep informed

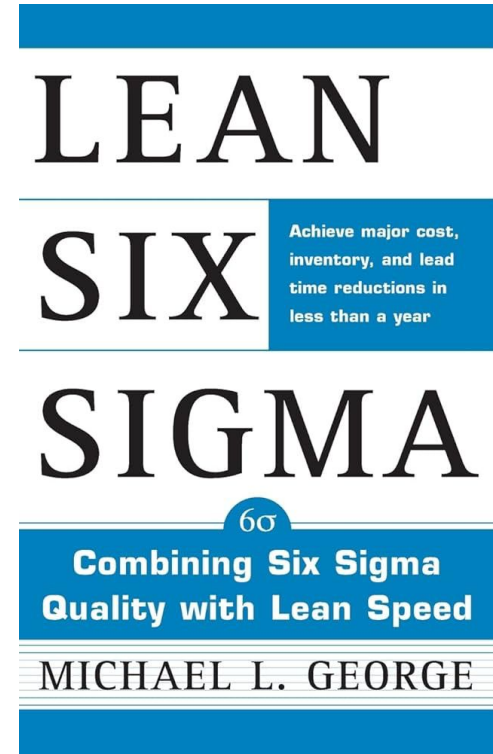
(Harned 2024)

	Project manager	Strategist	Designer	Front-end developer	Back-end developer
Create sitemap	C	R	A	I	I
Design wireframes	C	A	R	I	I
Create style guide	A	C	R	C	I
Code templates	A	I	C	R	C

History of Lean Six Sigma

- 1940s established by Japanese automaker Toyota
- 1990s large U.S. manufacturers attempted to compete with Japan's better-made products
- 2002 book *Lean Six Sigma: Combining Six Sigma with Lean Speed* by M. George and R Lawrence J.

(The Knowledge Academy 2024)



Definition of Lean Six Sigma

Lean Six Sigma

= is a collaborative managerial strategy aiming to enhance performance through the elimination of resource waste and defects.

= it combines Six sigma methods and tools with the lean manufacturing (Kenton 2023)



Tools and Techniques of Lean Sigma

- **5S pillars**

- Sort - eliminating items that do not add value to the process
- Set in order - organizing workstation with only items they need for their job
- Shine - cleaning and further tidying area, changes are made
- Standardize - setting standards for consistency
- Sustain - maintaining and reviewing standards (Staff 2022)



SORT



SET IN ORDER



SHINE



STANDARDIZE



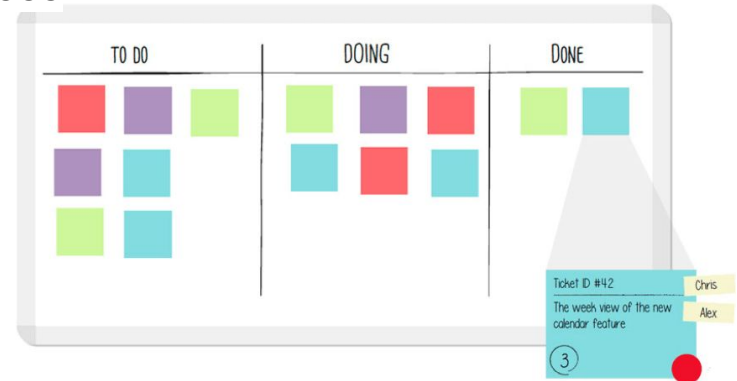
SYSTEMATIZE

Tools and Techniques of Lean Sigma

▪ Kanban

- popular method for managing tasks in Lean and Agile environments
- can be used at all levels (teams to companies)
- developed by Toyota, but it is used in different industries, especially in software development
- the way of thinking about a task and progress
- Kanban board
 - columns to do, doing, done

(Hessing 2024)



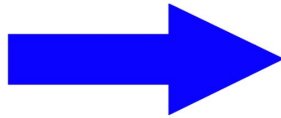
Tools and Techniques of Lean Sigma

- **Poka-Yoke** (error-proofing)= prevention of mistakes
 - mechanisms are always set up so that the process can only be executed in one possible way and the production is thus prevented from possible scrapping
- (Calhoun 2021)

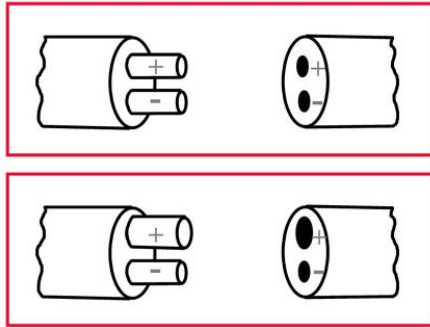
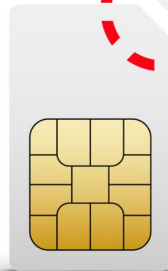
Confusion



Poka-yoke



Clarity



Tools and Techniques of Lean Sigma

- **Gemba walk**
 - "crime scene walk"
 - Improving company processes and productivity and includes a tour of the company's working areas. (Tarlengco 2024)

Elements



Go see



Ask why

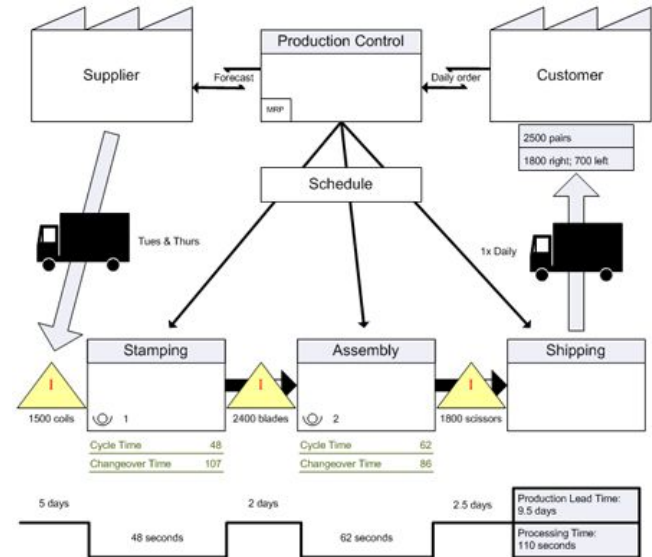


Show respect

Tools and Techniques of Lean Sigma

- **Value-Stream mapping (VSM)**
 - diagramming every step involved in the material and information flows needed to bring a product from order to delivery.
 - tool used in continuous improvement to identify and eliminate waste
 - current state map \Rightarrow future state map

(Lean Enterprise Institute 2022)



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Thank you for your attention!

Bonus

