

Lean Six Sigma

BENEFITS

- Process improvement and redesign (manufacturing, construction, financial services, healthcare, public sector, high-tech industry)
- Resulting in superior quality and efficiency levels
- Structural financial impact

STRATEGIC VALUE

- Superior cost structure
- Competitive advantages based on customer satisfaction
- Competence development in operations management, project management and continuous improvement

METHOD

- Professional and scientific problem solving
- Working with precise and quantitative problem descriptions
- Starting with a data-based diagnosis
- Designing evidence-based improvement actions

ORGANIZATION

- Improvement projects are led by Green and Black Belts, who are familiar with the process and Lean Six Sigma
- Improvement projects follow the DMAIC approach
- Lean Six Sigma program management coordinates projects by strategically choosing projects and making sure that benefits are realized

DEFINE

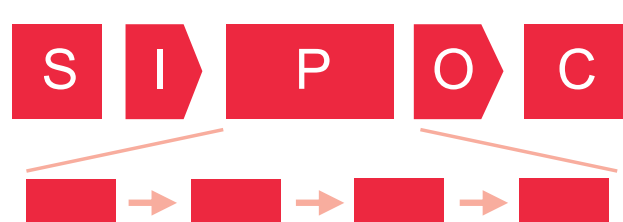
MEASURE

ANALYZE

IMPROVE

CONTROL

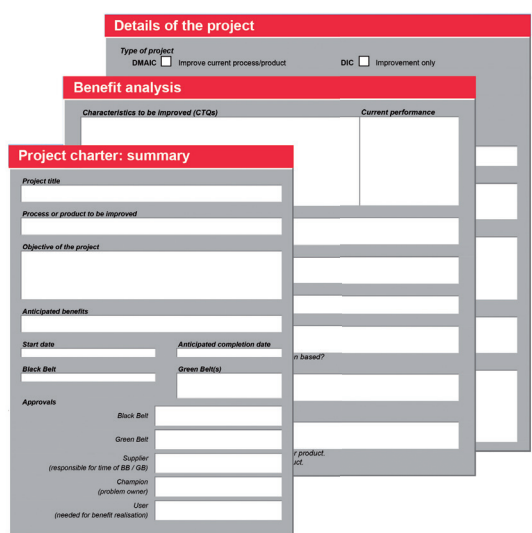
0. DEFINE THE PROJECT



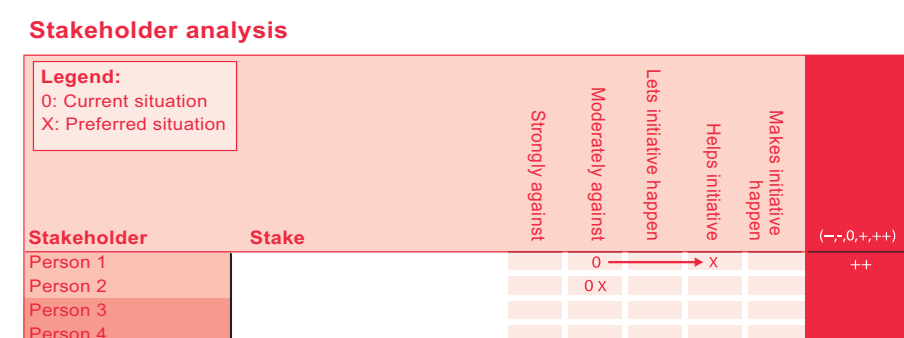
SIPOC



- Project charter
- SIPOC and process flow chart
- Benefit analysis
- Organization (time and review board)
- Stakeholder analysis

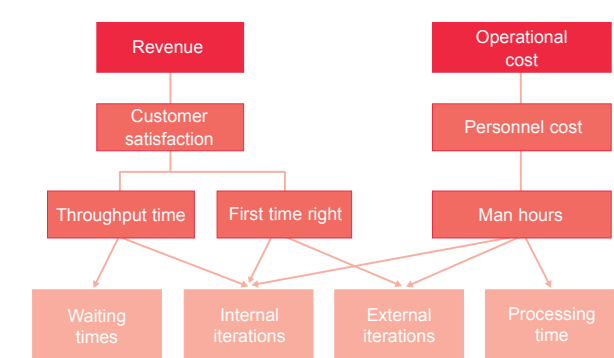


Project charter



Stakeholder analysis

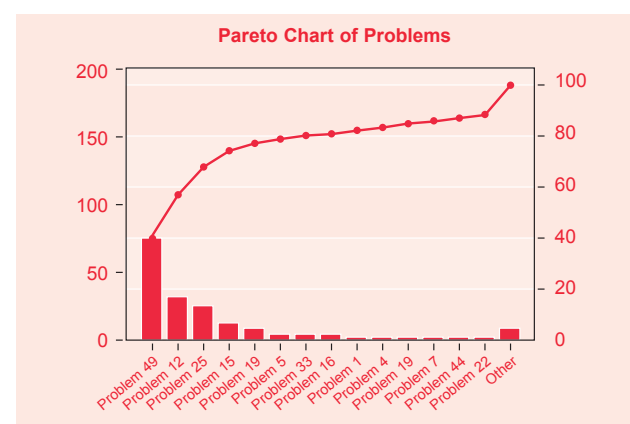
1. DEFINE THE CTQs



CTQ flowdown



- CTQ flowdown
- Operational definitions
- Measurement plan and forms



Pareto analysis

		Throughput time		Processing time (min)			
		Start	End	PT-Arch1	PT-Arch2	PT-Cred	
Case 1	5-4-2004	17-4-2004	7:45	35:56	2:53	7:5	
Case 2	5-4-2004	27-4-2004	7:08	33:29	2:46	7:04	
Case 3	5-4-2004	22-4-2004	8:01	7:04	3:51	8:9	
Case 4	5-4-2004	13-7-2004	8:06	43:52	2:49	8:48	
Case 5	5-4-2004	9-8-2004	7:78	18:42	3:08	10:52	
Case 6	5-4-2004	21-4-2004	8:19	67:04	3:16	5:56	
Case 7	5-4-2004	29-4-2004	7:84	30:5	2:62	9:6	

Data collection form

2. VALIDATE THE MEASUREMENT PROCEDURES



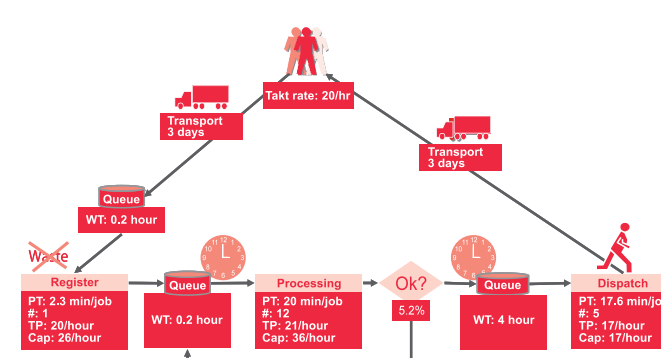
Check definitions and calculations



Face validity

- Validity of the measurements: before, during and after data collection
- Precision: gage R&R or agreement study (kappa)
- Pilot measurement
- Start measuring

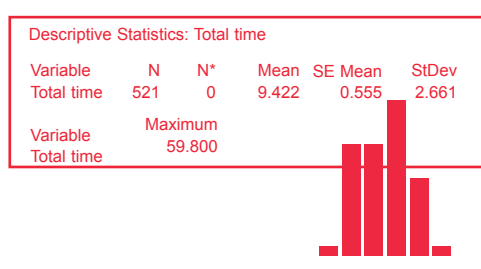
3. DIAGNOSE THE CURRENT PROCESS



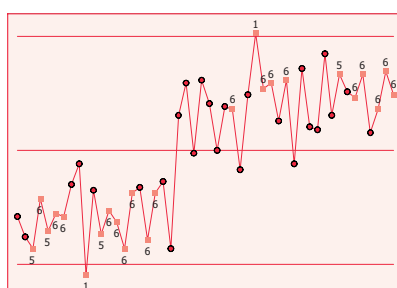
Value stream map



- Process behavior over time
- Process capability analysis
- Value stream map
- Redefine project objectives

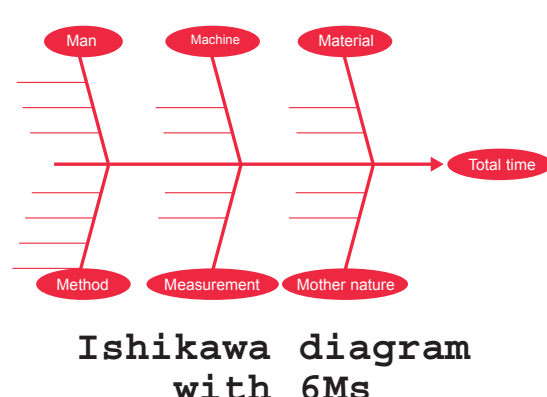


Process statistics and histogram



Control chart

4. IDENTIFY POTENTIAL INFLUENCE FACTORS



Ishikawa diagram with 6Ms



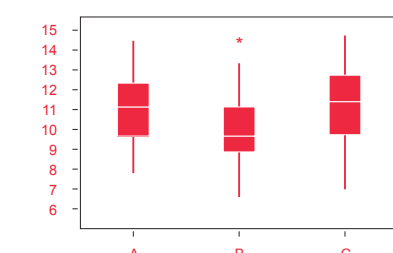
- Brainstorm sessions
- Expert interviews
- BOB vs. WOW and autopsies
- FMEA
- Process inefficiencies in value stream map
- Process matrix



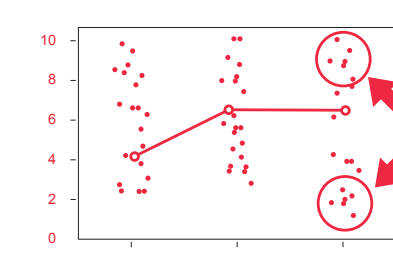
Brainstorming session

Failure mode	O	S	D	RPN
Failure 1	3	2	4	24
Failure 2	8	5	9	360

FMEA



Exploratory data analysis



BOB vs. WOW study and autopsies

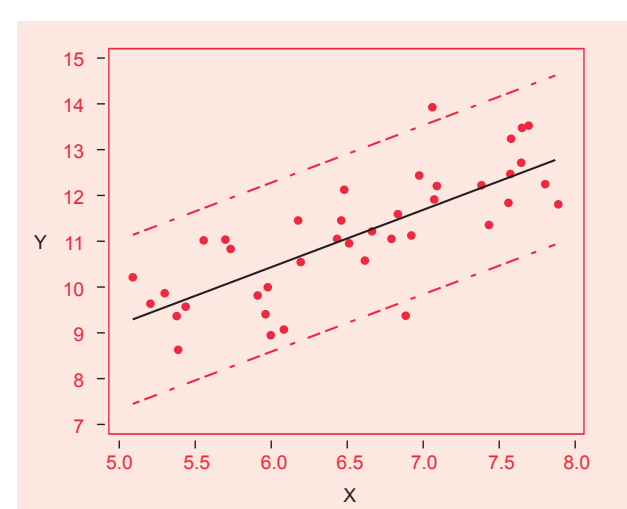
5. ESTABLISH THE EFFECT OF INFLUENCE FACTORS

Control variables			
DMAIC 4: possible influence factors		DMAIC 5: effect	
Influence factor	CTQ1	CTQ2	Impact
Sales person	X	X	+
Using a sales script	X		++
Coaching	X		++
Incentives sales persons	X		++
Incentives advisors	X	X	++
Timing of the call	X	X	++
Product knowledge	X	X	++
Department	X	X	++
Call duration	X	X	++
Courteousness	X	X	++

Process matrix

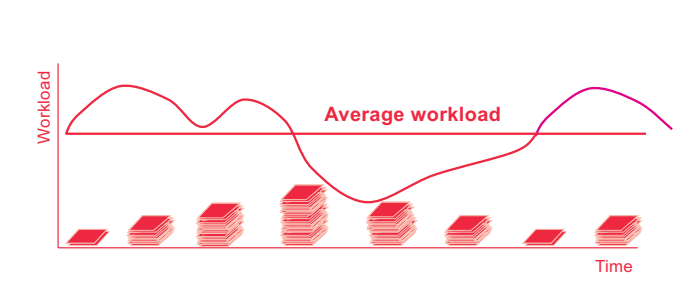


- Select the most important influence factors
- Determine impact and changeability of influence factors
- Summarize evidence



Statistical data analysis

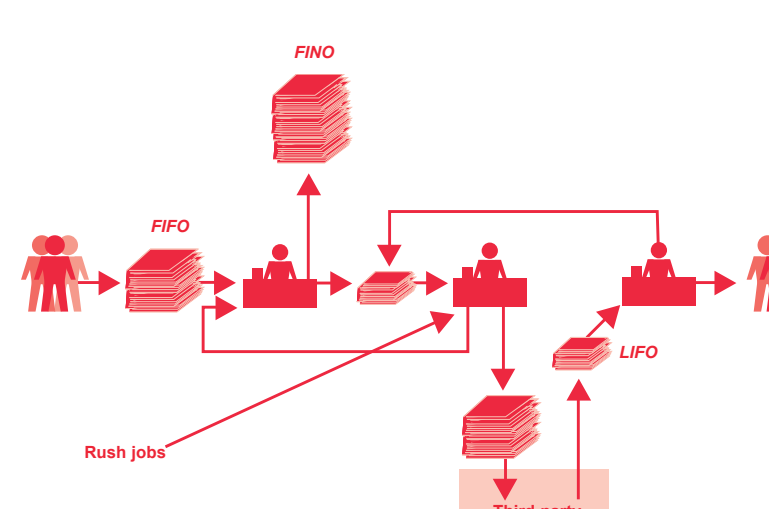
6. DESIGN IMPROVEMENT ACTIONS



Capacity vs. workload

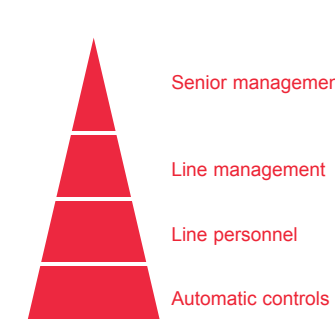


- Improvement actions
- Operations management
- Description of the new process
- Impact on the CTQs



Rationalizing, routing, streamlining and line balancing

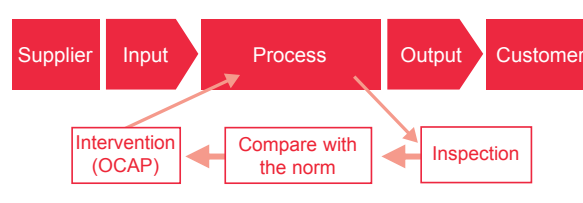
7. IMPROVE PROCESS CONTROL



Control pyramid



- Process description and operating procedures
- Control plan and control loops (feedback and feedforward)
- Roles and responsibilities
- Logs, dashboards and quarterly reports
- Mistake proofing (poka-yoke)



Control loops



Poka-yoke



5S and visual management

8. CLOSE THE PROJECT



Benefit tracking

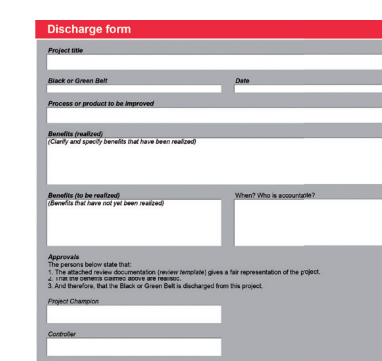


Project documentation

- Benefit realization
- Implementation plan
- Project documentation
- Follow-ups

	Technical	Organizational	Political
Plan			
Initiate			
Implement			
Monitor			
Close			

Implementation roadmap



Discharge form

