

dcm

Starts at 10am

Member Webinar

LSS Yellow Belt Session 2 of 3



What's Coming Up?



Delivered Live via Zoom



All Sessions Recorded



Free and unrestricted for DCM Members

10am

July
1st

**Making Lean Work
For Your
Organisation**

10am

Aug
2nd

**Problem Solving &
Eliminating of
Wasteful Procedures**

10am

Sept
2nd

**Measuring &
Continual
Improvement**

Session Content

- ▶ **Recap**
- ▶ **Problem Domains**
- ▶ **Continuous Improvement**
- ▶ **Kaizen, A3, DMAIC**
- ▶ **Problem Statements**
- ▶ **Process Mapping**

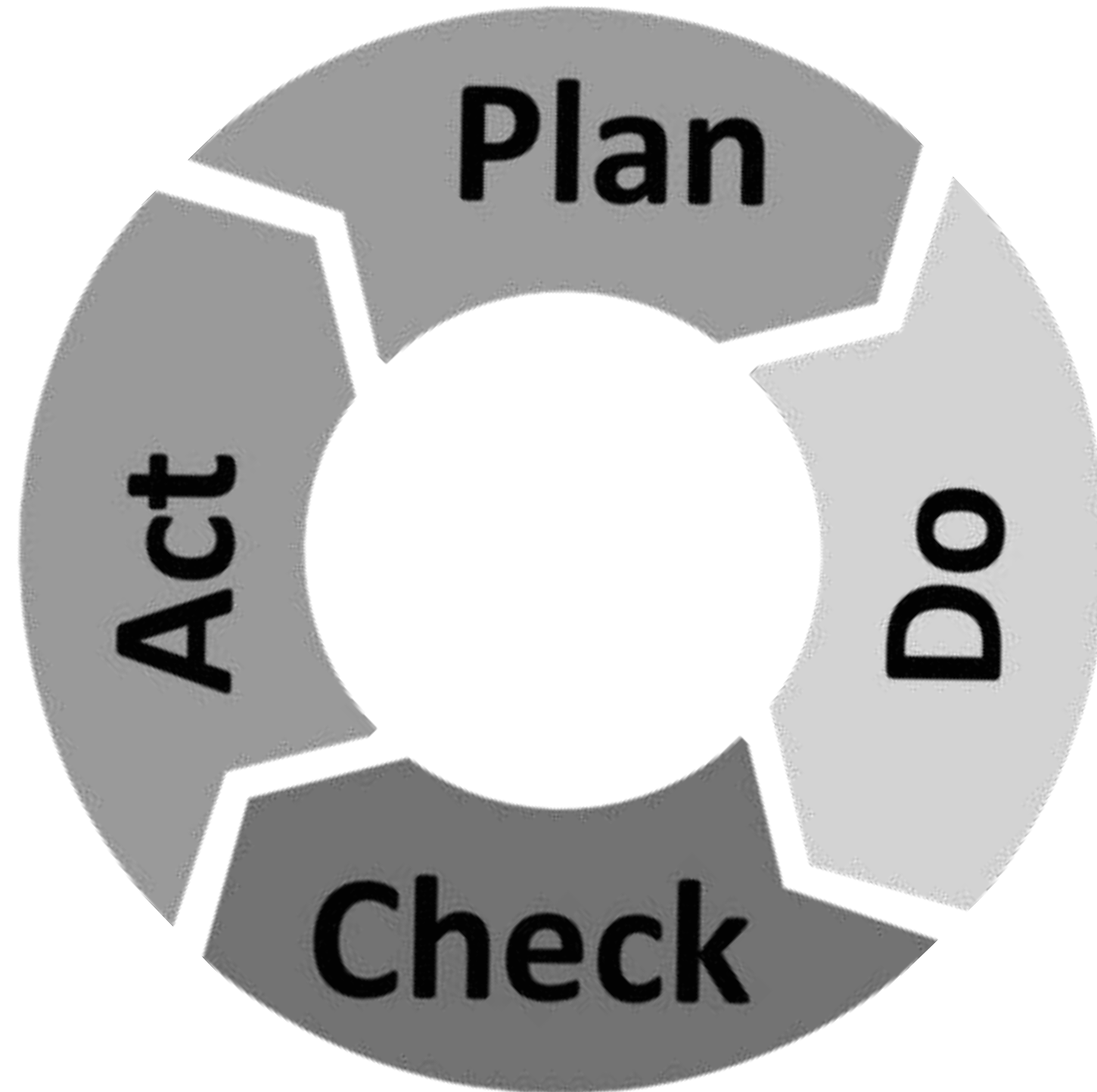
RECAP

Continuous Improvement

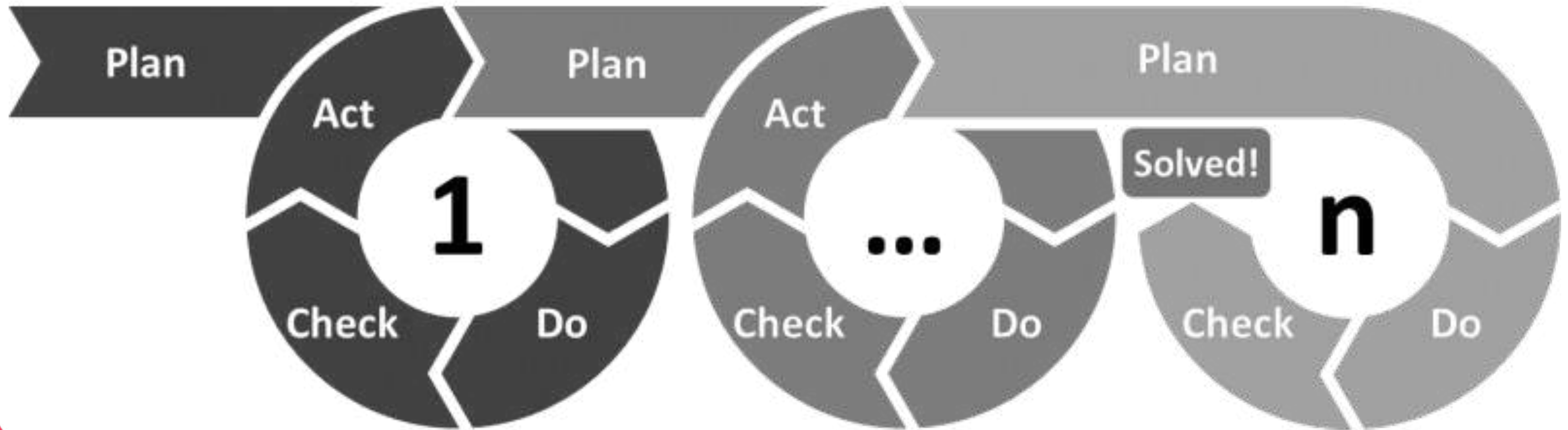
What is Waste

Problem Domains

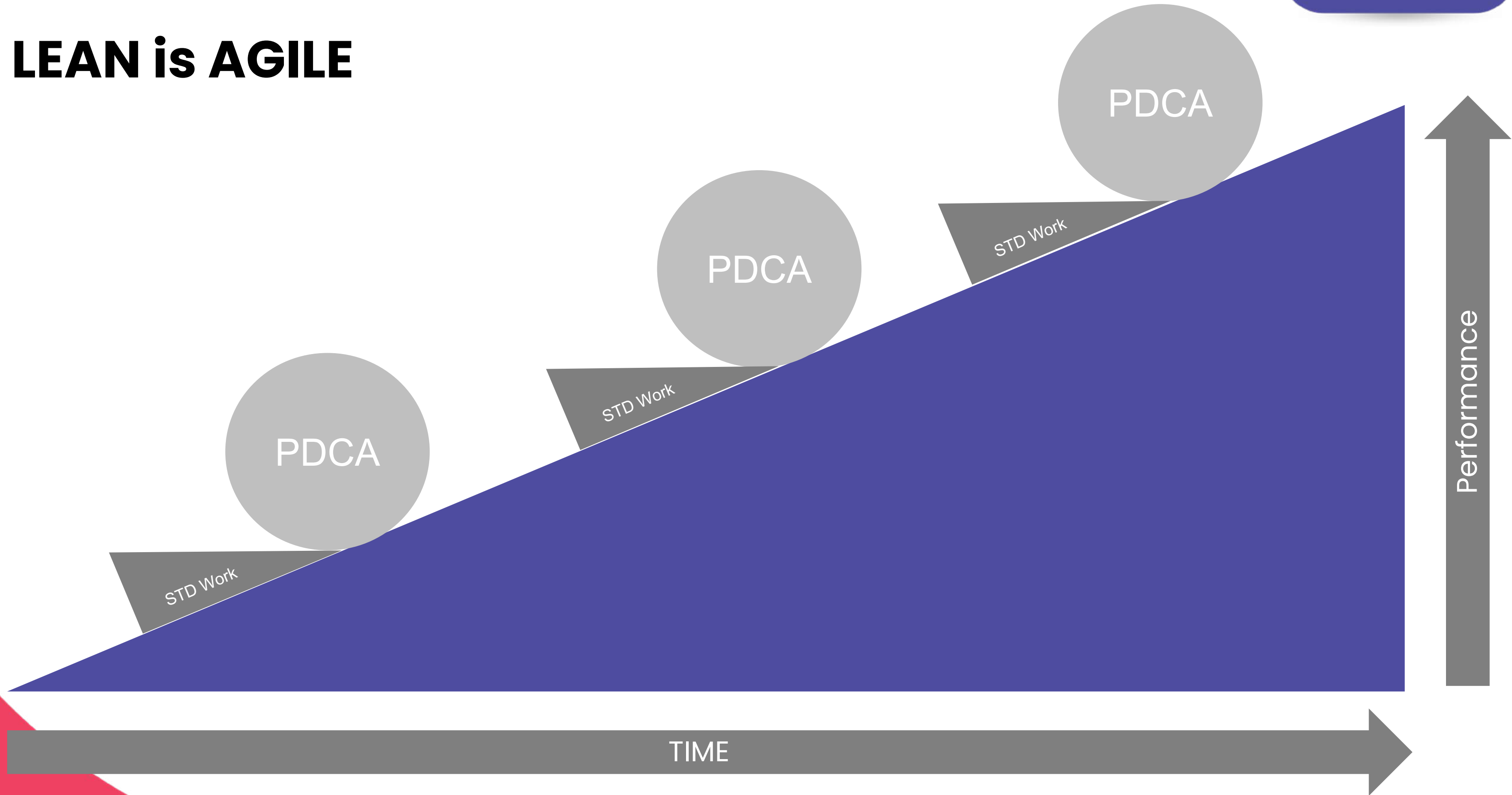
The Deming Cycle



The Deming Cycle



LEAN is AGILE



The nature of “FLOW”

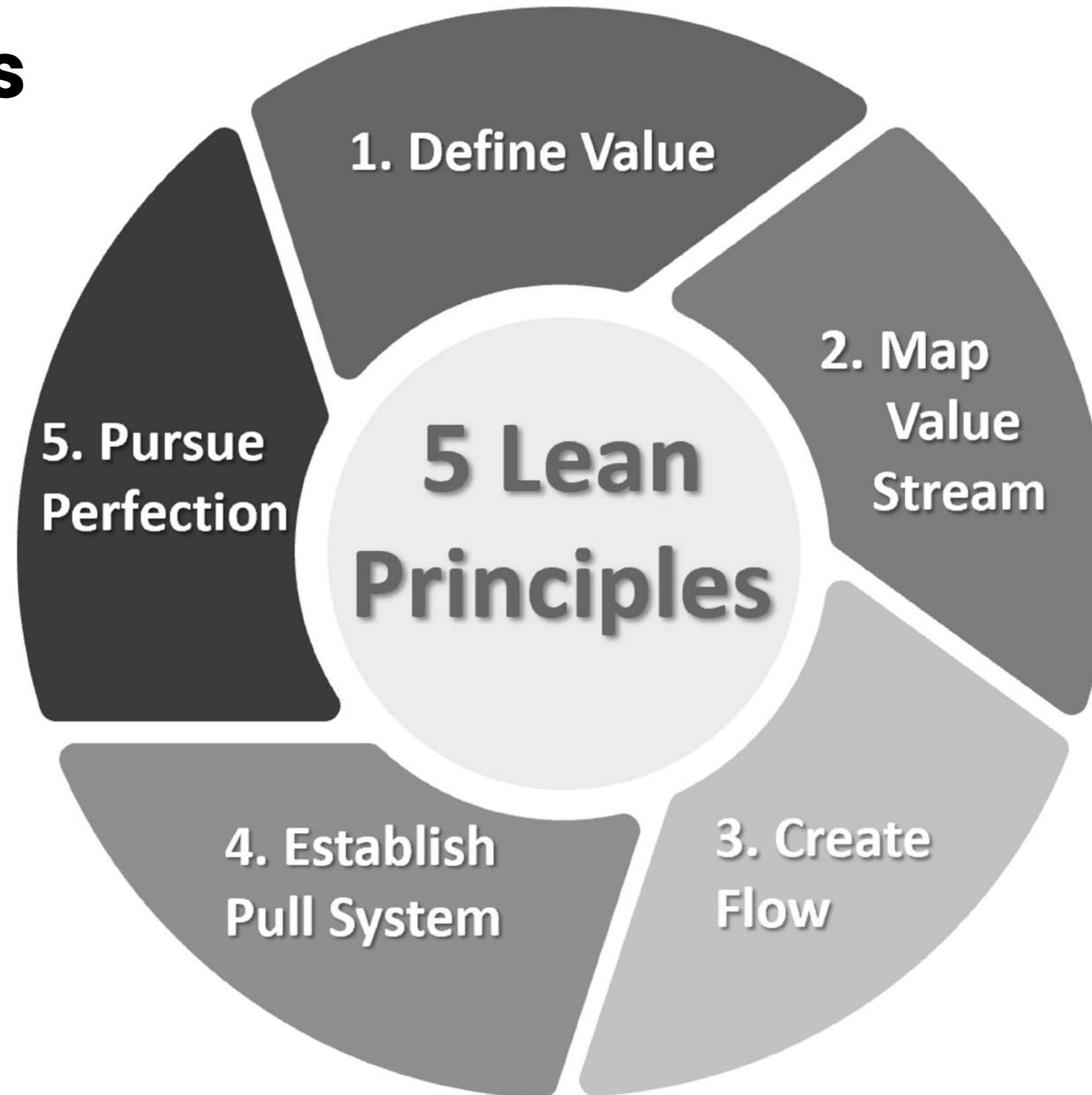
Step 1

Step 2

Step 3

LEAN PRINCIPLES

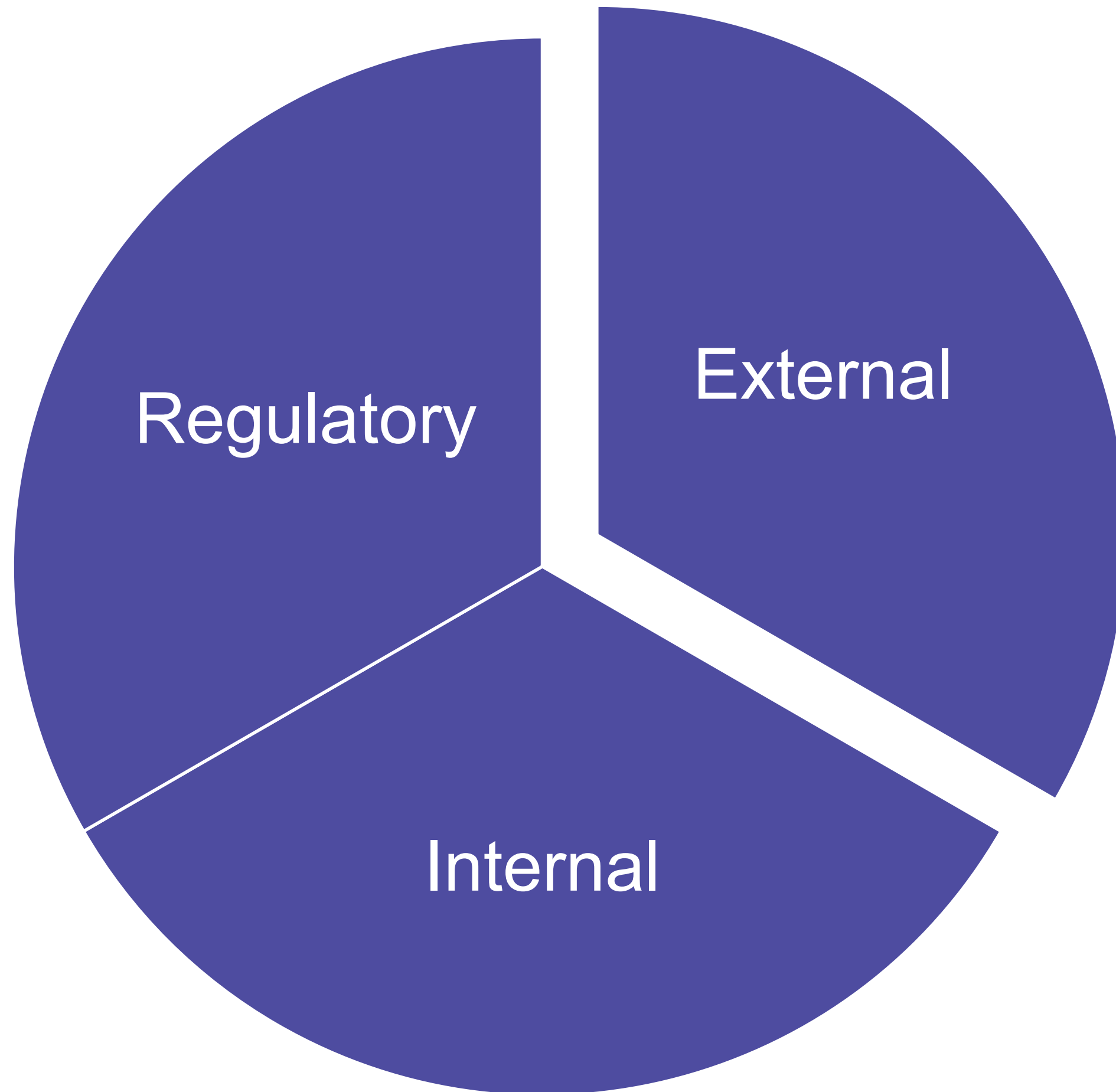
LEAN Principles



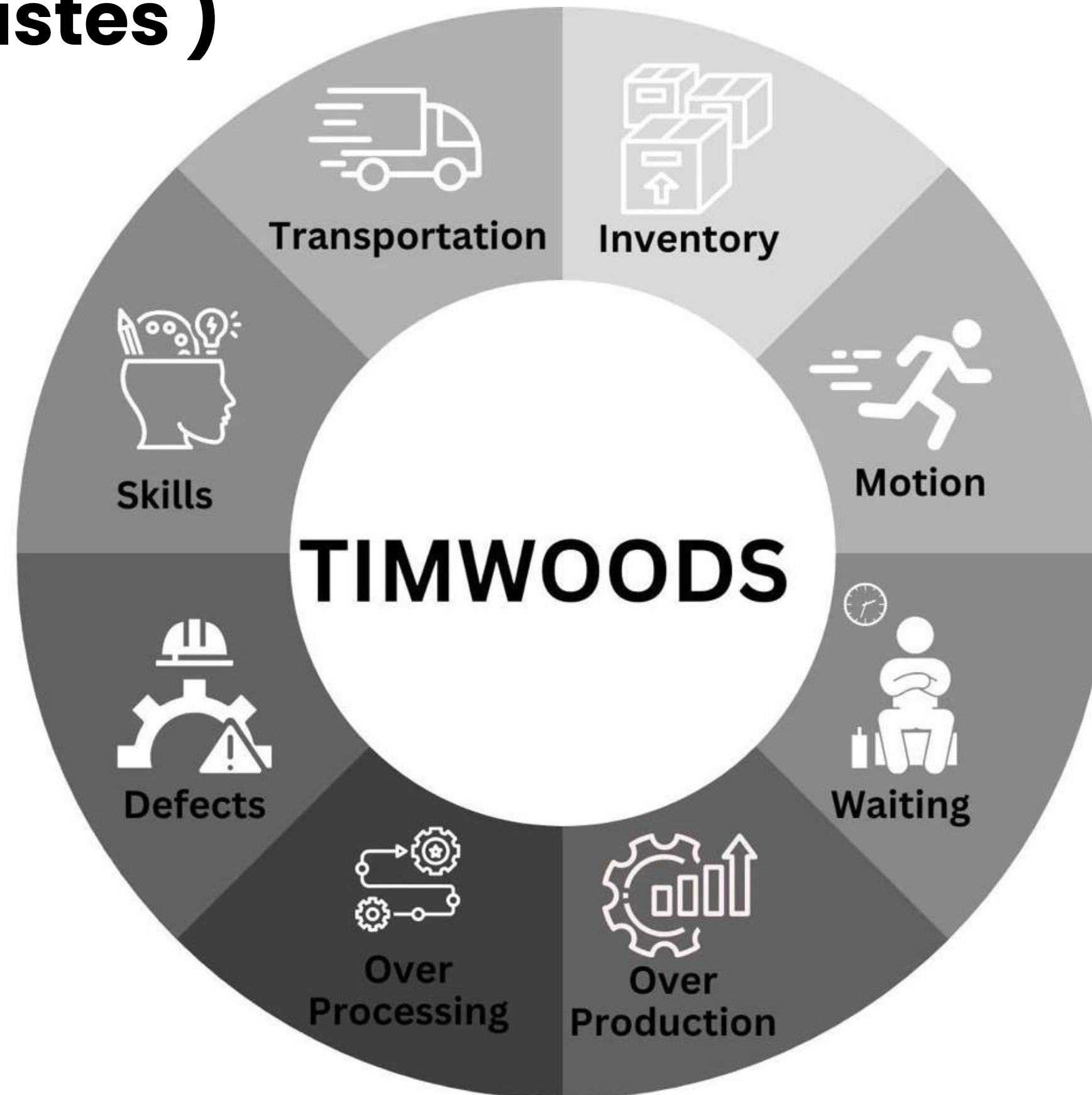
What is waste



Customer Types



The 8 Muda (Wastes)



PROBLEM DOMAINS

Cynefin Model

Simple Problems

Known
Knowns

OBVIOUS

Chaotic Problems

Unknowable's

NOVEL

Complicated Problems

Known
Unknowns

BEST Practise
Experts

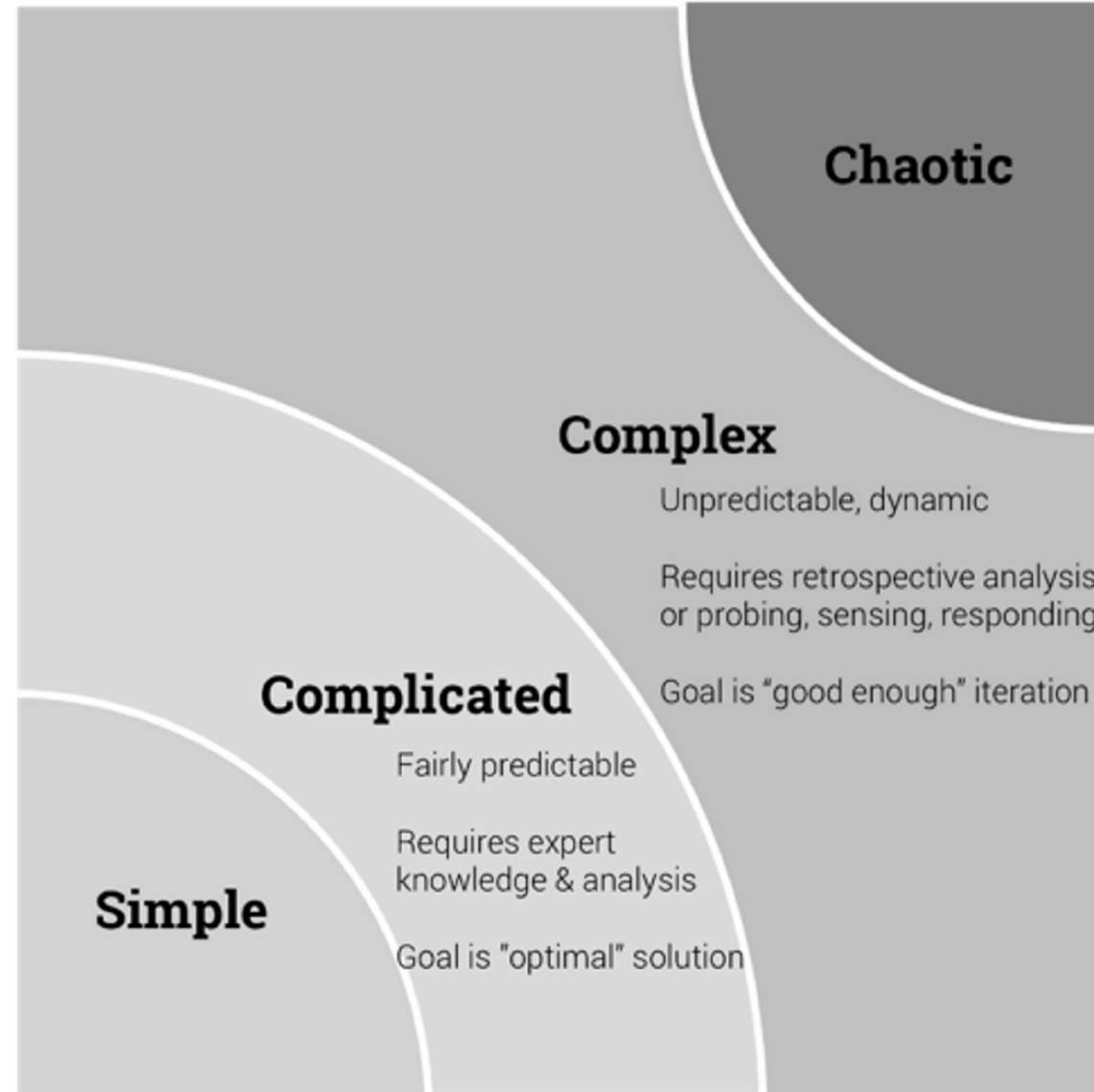
Complex Problems

Unknown
Unknowns

PROBE / SENSE
AGILITY

Cynefin Model

No agreement



No certainty

Problem Solving

**What do we
KNOW**

**What don't we
KNOW**

How do we Find Out

- Observe ?
- Interview ?
- Measure ?
- Test ?
- Experiment ?
- Trial ?
- Exchange ?
- Reproduce ?
- Dis-assemble
- De-construct
- Consult

Gemba Walks



Go to Gemba

WEAR THE
REAL
WORLD

LEAN TEAMS

LEAN Teams Options



KAIZEN Teams



A3 Teams



DMAIC Teams

KAIZEN

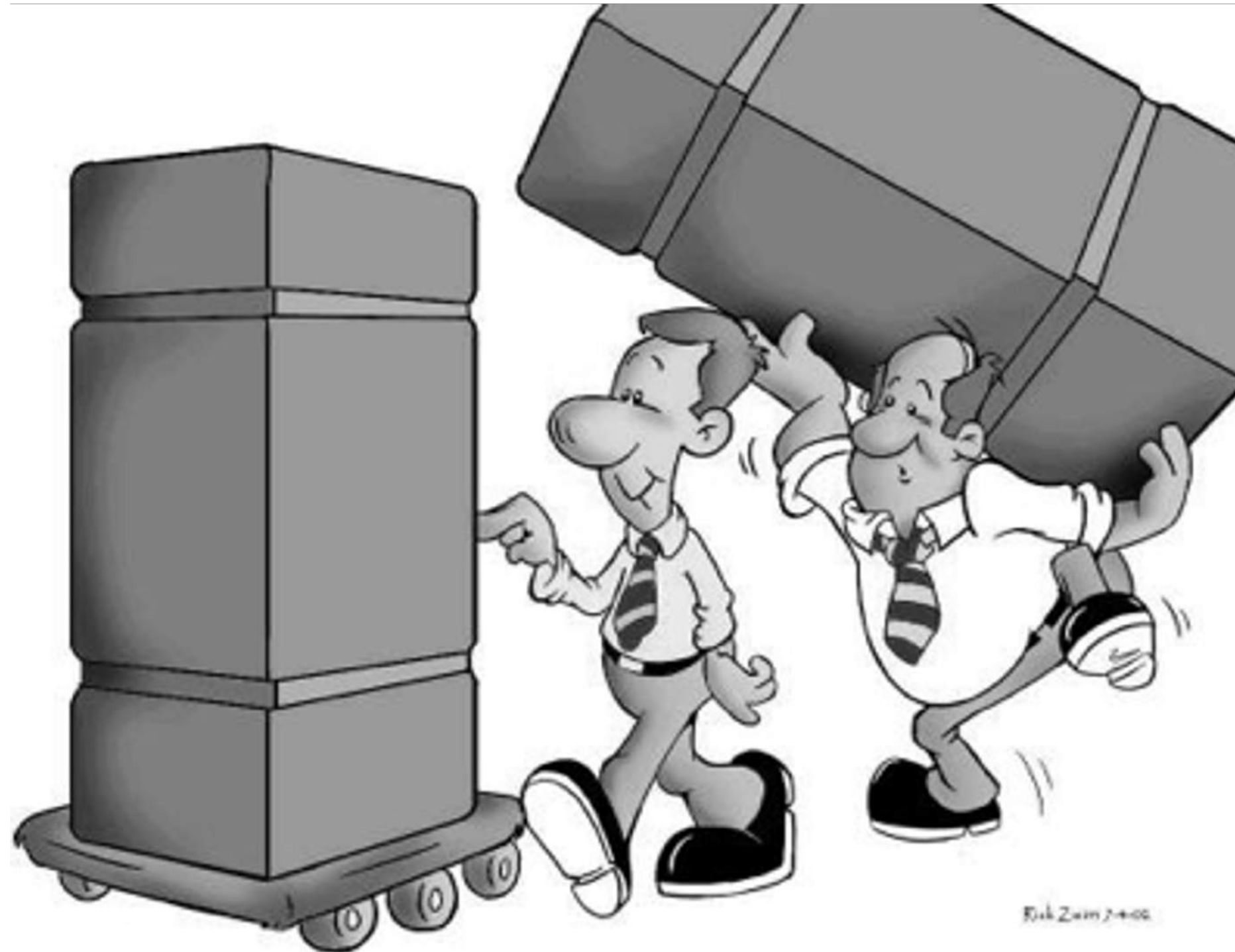
KAI

ZEN

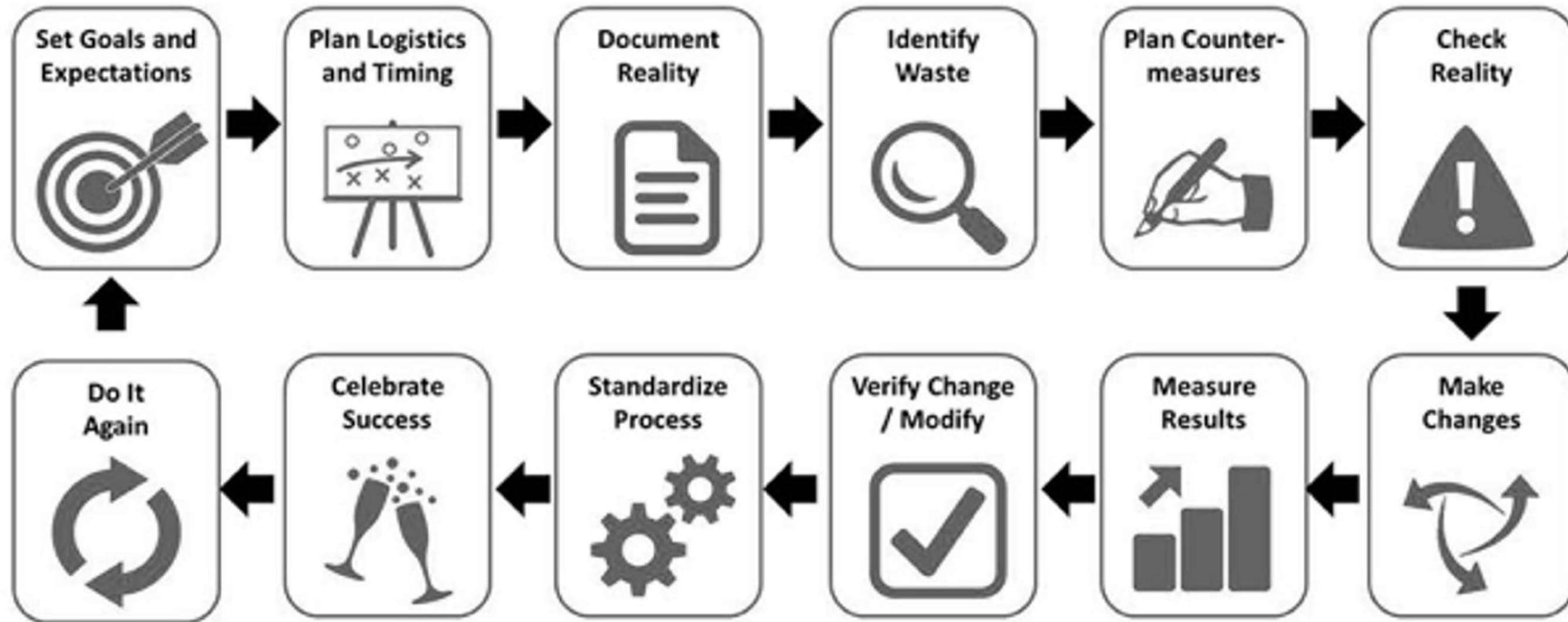
改 善

Change for Good

KAIZEN



KAIZEN



A3

Example of completed problem-solving A3 / ONLINE FIGURE 1

1. Clarify and validate the problem.

The U-2 major phase inspection is averaging 15 days, exceeding the 13-day inspection target, and it cannot efficiently sustain worldwide U-2 aircraft operational requirements.

Average: 15 Trend = Up

OMM = operations and maintenance

2. Break down the problem/identify performance gaps.

- Lack of communication and schedule between phase and MXG results in personnel availability
- Ancillary tasks reduce maintainer availability
- Current work procedures, attention to detail drive excess MX and inefficiencies

MXG = maintenance groups
MX = maintenance

3. Set improvement target.

Achieve 13-day major phase by July 31, 2010.

OMM = operations and maintenance

4. Determine root cause.

Problem: Ancillary tasks reduce maintainer availability

Cause: too many current procedures, tool crib, smoke breaks

Root cause: Poor housekeeping, Just skip it now, Lack sleep conduct double rd call, On-site borrower, Tool calls with power strips, Establish smoking policy

FOD = foreign object damage

5. Develop countermeasures.

Action	POC	Start	End	Status	Remarks	Do-It
Spaghetti diagram and process time for A/C tear down	Mr. Harrington Mt. Rowan	Jan. 23	Jan. 26			X
Spaghetti diagram and process time for TC/TCO process	Mr. Harrington Mt. Rowan	Jan. 23	Jan. 26			X
Spaghetti diagram and process time for Locks	Mr. Harrington Mt. Rowan	Jan. 23	Jan. 26			X
Spaghetti diagram and process time for Ops checks	Mr. Harrington Mt. Rowan	Jan. 23	Jan. 26			X
Spaghetti diagram and process time for reassembly	Mr. Harrington Mt. Rowan	Jan. 23	Jan. 26			X
Spaghetti diagram and process time for post dock work cards	Mr. Harrington Mt. Rowan	Jan. 23	Jan. 26			X
Time in motion study	Mr. Harrington Mt. Rowan	Jan. 23	Jan. 26			X
Quality assurance pass rates	T/Sgt Bernard	Jan. 15	Jan. 21			X
Phase roll out stats	Mr. Rowan	Jan. 15	Jan. 15			X
Paper doll	Mr. Rowan	Jan. 15	Jan. 15			X
Consumable usage data for killing					C/W	

A/C = aircraft
TCI = time change item
TCO = time compliance technical order
POC = point of contact
Ops = operations
C/W = complied with

6. See countermeasures through.

Action	POC	Start	End	Status	Remarks	Do-It
Spaghetti diagram and process time for A/C tear down	Mr. Harrington Mt. Rowan	Jan. 23	Jan. 26	C/W		X
Spaghetti diagram and process time for TC/TCO process	Mr. Harrington Mt. Rowan	Jan. 23	Jan. 26	C/W		X
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Consumable usage data for killing				C/W		

A/C = aircraft
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7. Confirm results and process.

U-2 major phase inspection days April 27, 2009 - Aug. 19, 2010

Average: 13 Trend = Down Goal = 13 days Vision = 11 days

VSA = value stream analysis
A/C = aircraft

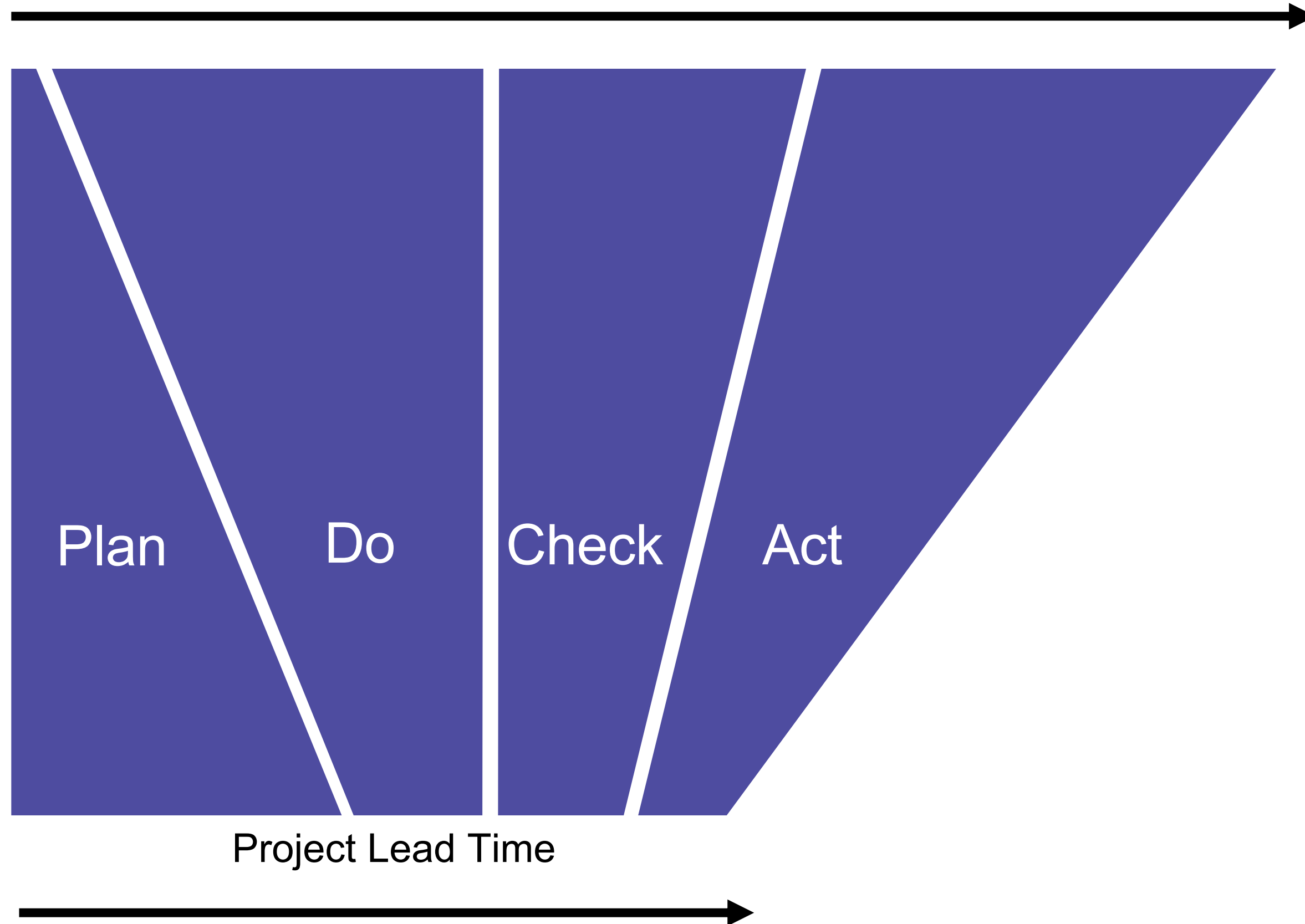
8. Standardize successful processes.

- Implemented in house training manager and plan.
- Created standard inspection task flowchart.
- Established biannual ancillary block training week.
- Realign critical inspection tasks to proper shift.
- Reassigned aircraft phase prep tasks among AMKS and MXS.
- Act: refuel and defuel in hanger.
- Standardized parts kits.
- Event A3 uploaded to CPI-MI.

AMKS = aircraft maintenance squadron
MXS = maintenance squadron
CPI-MI = continuous process improvement management tool
Act = aircraft
TCO = time compliance technical order
TCI = time change item

A3

Project Lead Time



A3

Plan	Step 1	Subject / Background / History	Step 5	Countermeasures / Suggested Actions / Changes		Do																	
	<p>What are we trying to achieve with this process? What is the Background to the problem (be as specific as possible) Give an explanation which helps people to better understand the problem State the importance of the problem</p>		<p>What specific actions are needed to eliminate the problem?</p>																				
	Step 2	Current Condition	Step 6	Implementation																			
	<p>Draw a diagram of current condition Highlight the problem Use data to explain the size of the problem</p>		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">What</th> <th style="width: 33%;">When (date)</th> <th style="width: 33%;">Whom</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>				What	When (date)	Whom														
	What	When (date)	Whom																				
Step 3	Root Cause Analysis	Step 7	Evaluation		Check																		
<p>Collect and analyse data to identify root cause Use 5 Whys, Fishbone diagrams, Pareto charts</p>		<p>Check the results Did the improvement work? Did it work as well as we predicted? Collect data and compare before and after</p>																					
Step 4	Target Condition / Future State / Desired outcome	Step 8	Follow-up		Act																		
<p>Draw a diagram of what the new process will look like Identify WHERE the Root Cause is being eliminated Define target to support proposed improvement</p>		<p>What actions must we do in future to sustain the improvement? Schedule meetings @ 7 / 30 / 90 days Did we achieve @ 7 / 30 / 90 days what we wanted? Is the problem eliminated and does the process show measurable improvement? Can we close this Problem Solving process and archive it as Complete / Closed?</p>																					

A3

A3 & PDCA Cycle

Background & Support Data
(PLAN)

Describe the Current state
What are we trying to solve.
(PLAN)

Set Goals and Targets.
Define what success looks like
(PLAN)

Perform Root Cause Analysis
(PLAN)

Design Counter Measures
(PLAN)

Implement the Countermeasures
(DO)

Follow UP (Check)

Follow UP (Act)

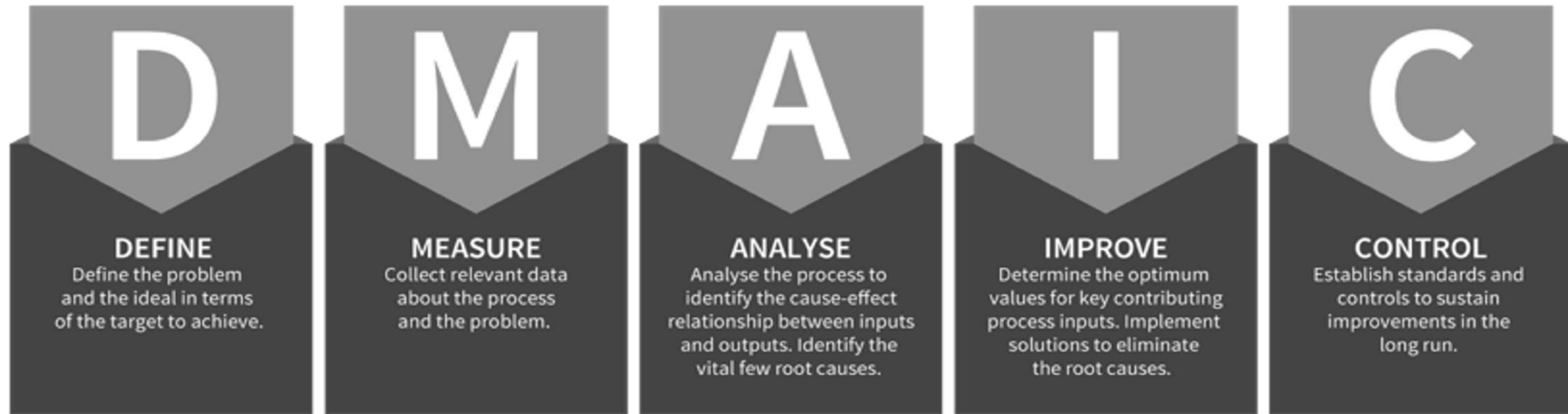
DMAIC



DMAIC v's PDCA



DMAIC



PROBLEM STATEMENTS

What is a Problem

- Undesired situation
- A matter or situation regarded as unwelcome or harmful and needing to be dealt with and overcome.

What is a Problem



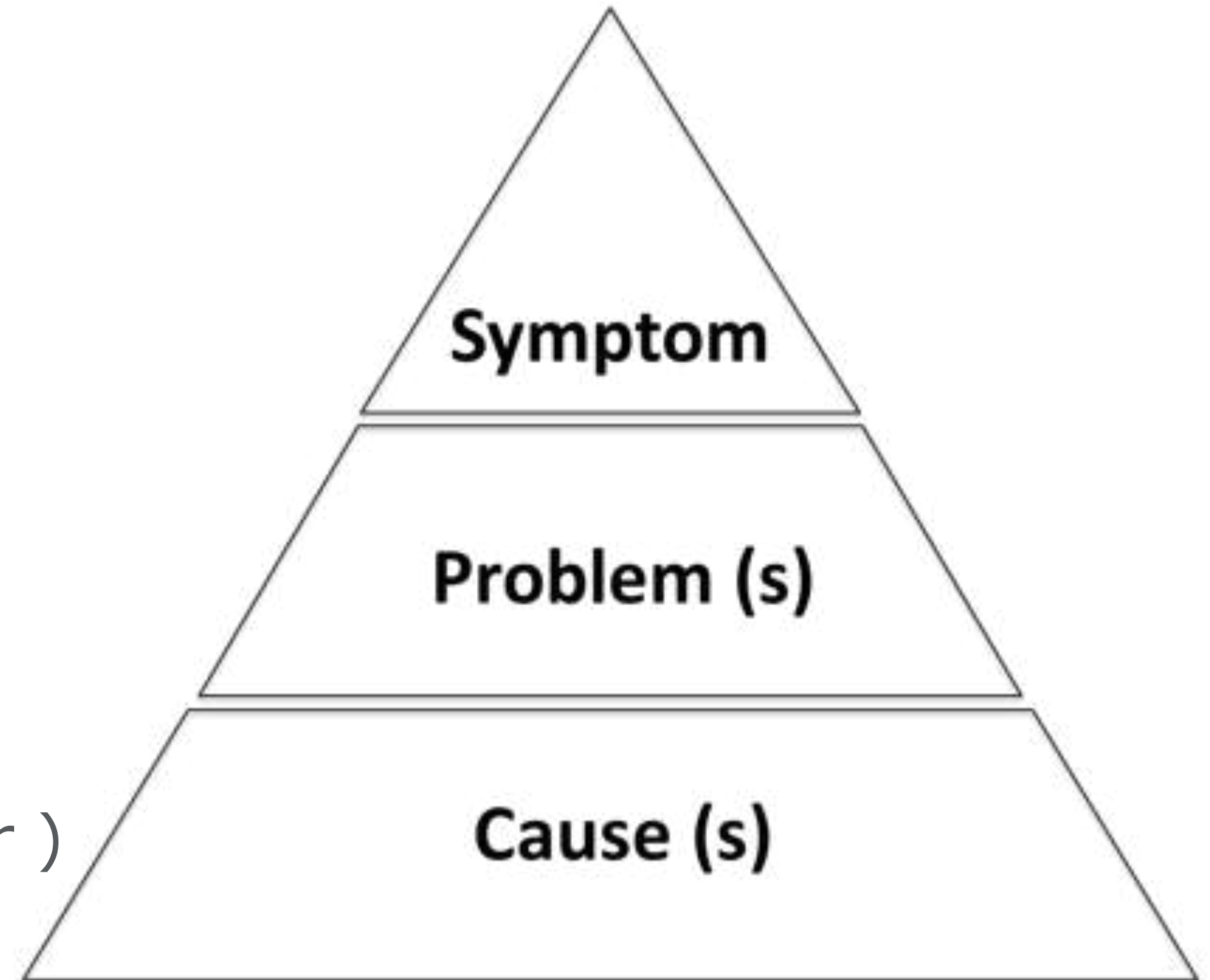
Above the surface you see the
Symptoms
of the problem

Dig deeper to find the
Root Cause
of the problem

Symptoms V's Root

- Symptoms (what we see)

- Root Cause (trigger / enabler)



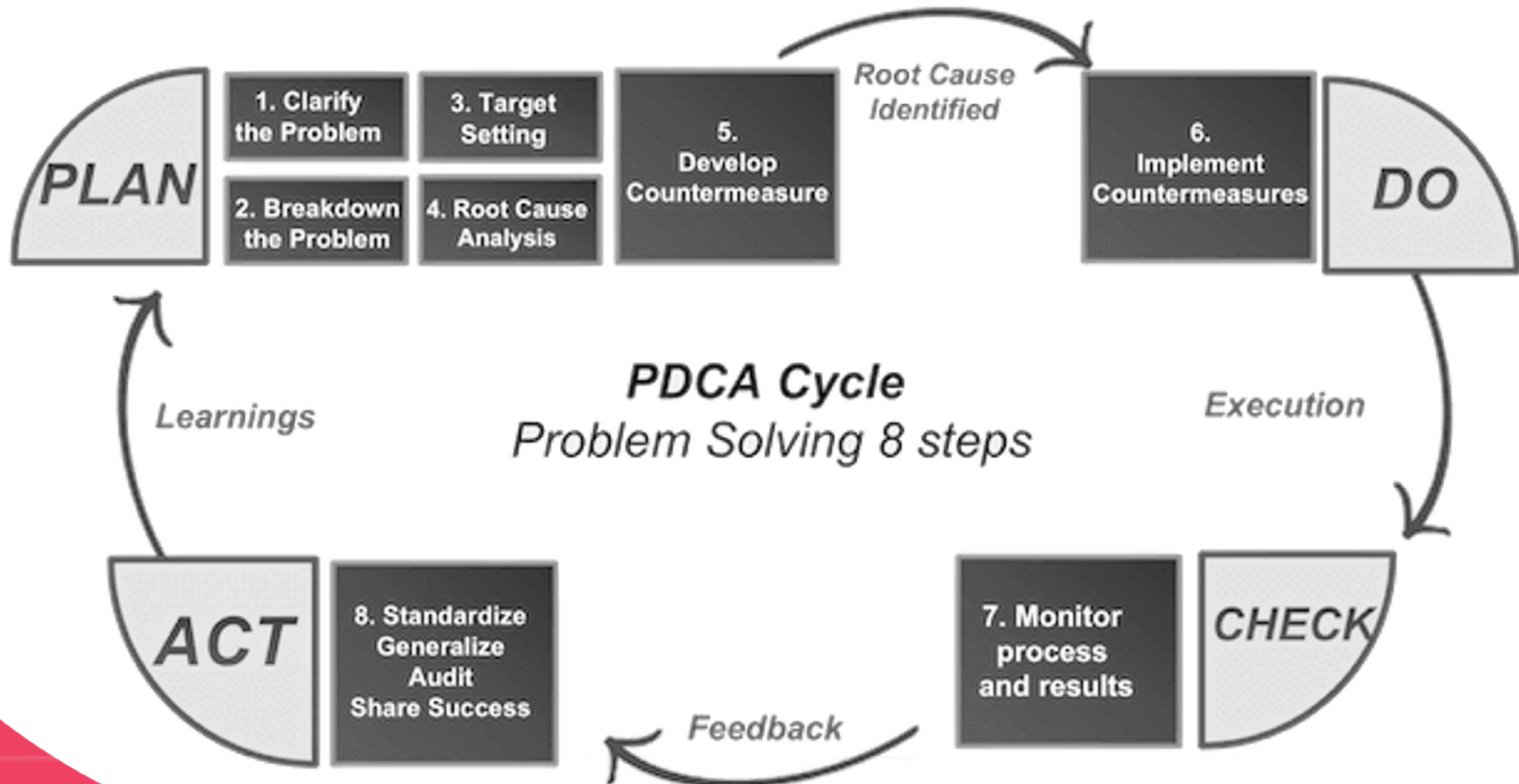
Barriers

- Confirmation Bias
- Rigid Mentality
- Functional Fixedness
- Unnecessary constraints
- Irrelevant Information

What is a Solution

- Implement(ed) Counter Measure(s)
- The most effective arrangement of Tasks, Actions and resources to overcome the problem permanently.

Problem Solving



RCA Tools

Soft Tools

- Brainstorm
- Mindmaps & Process maps
- 5 Why's
- W5H
- Fishbone Analysis
- Workshops
- 6 Hats Thinking
- Kepner- Tregoe
- FMEA

Hard Tools

- Hypothesis Testing
- Design of Experiments
- MultiVary Studies
- Taguchi Analysis
- Pareto Analysis
- Regression Analysis
- SPC
- ANOVA
- AI Models

Construct a Statement

- Problem Statement
- A GOOD Problem Statement should
 - State the current undesired situation
 - Quantify the problem
- A GOOD Problem Statement should NOT
 - Assume the cause
 - Assume the solution
 - Assume any blame

Construct a Statement

■ A GOOD Problem Statement (example)

–During the period 1st Jan 2023 until June 30th 2023, >15% of customer queries were not resolved first time leading to 250hours of overtime to handle the escalations costing €12,500

- **Provides the facts**
- **Provides timescales and impact to the business**
- **Clear and concise – non objectionable**

Construct a Statement

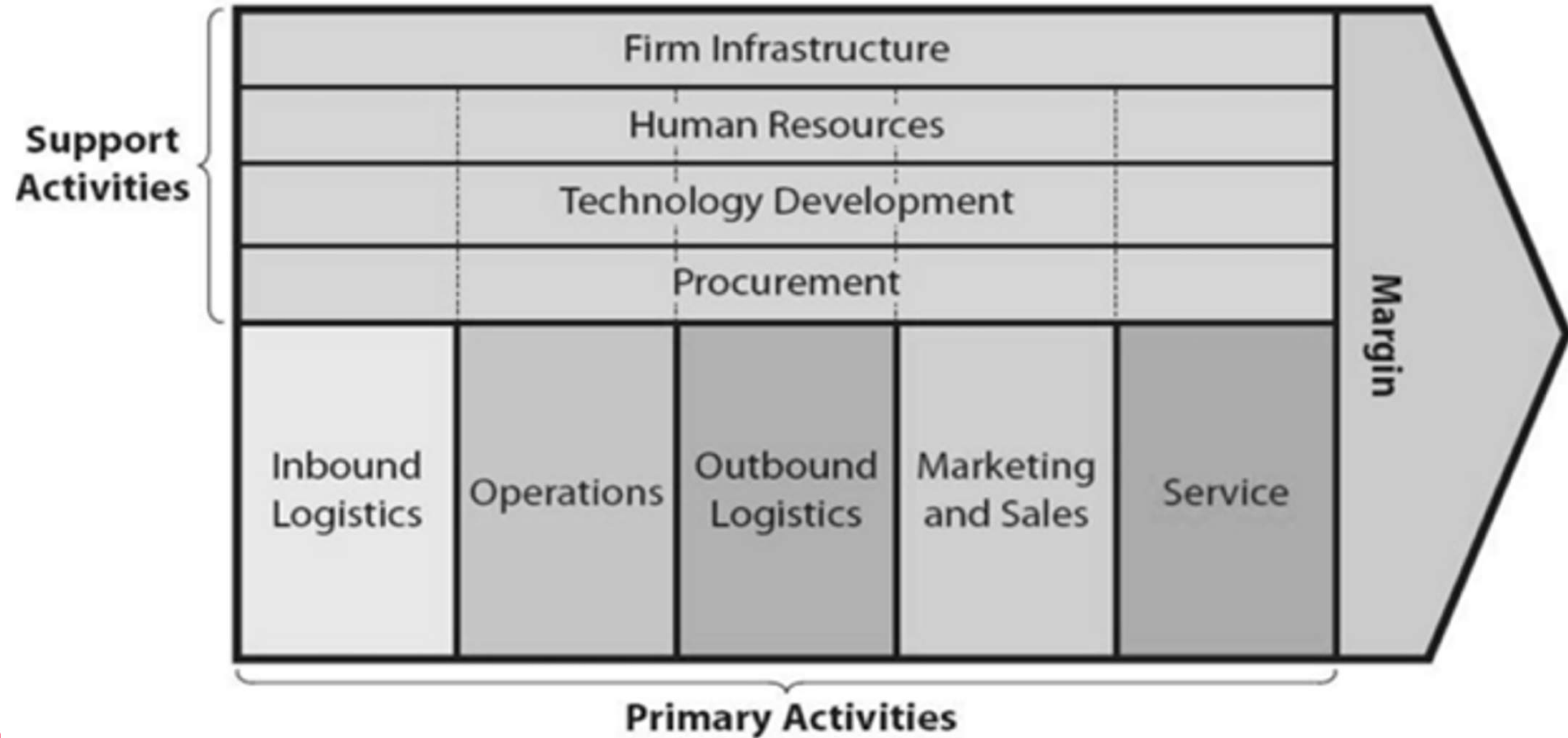
- A GOOD Problem Statement - structure
(**Item**) is a problem because it affects (**Case / impact**) and we have established the (**evidence**).
- **Item** : is a condition, procedure, hardware, equipment or process
- **Case / impact** : is quality, cost, service and or frequency
- **Evidence** : is a symptom(s) or data collected

PROCESS MAPPING

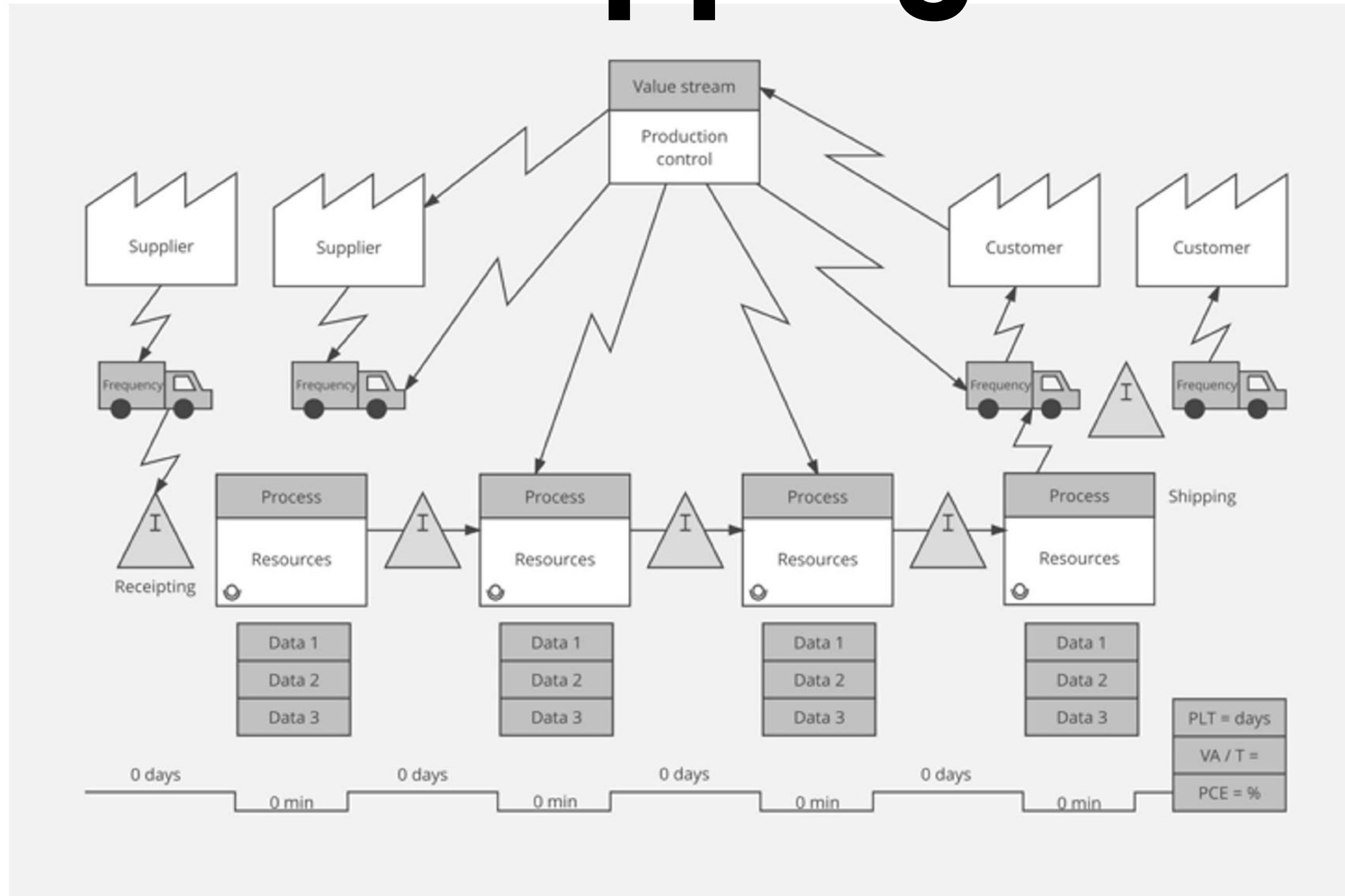
Process mapping



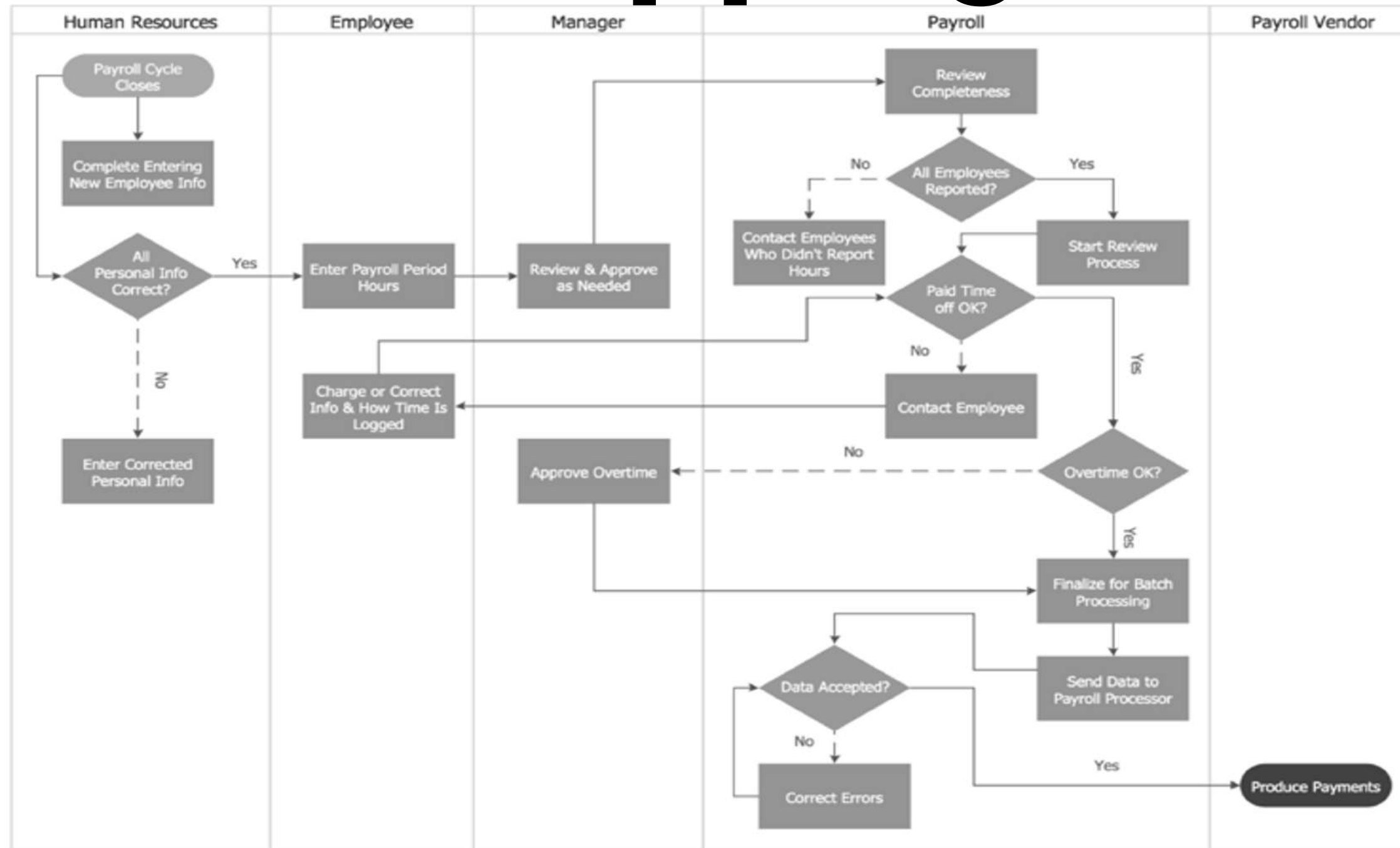
Process mapping



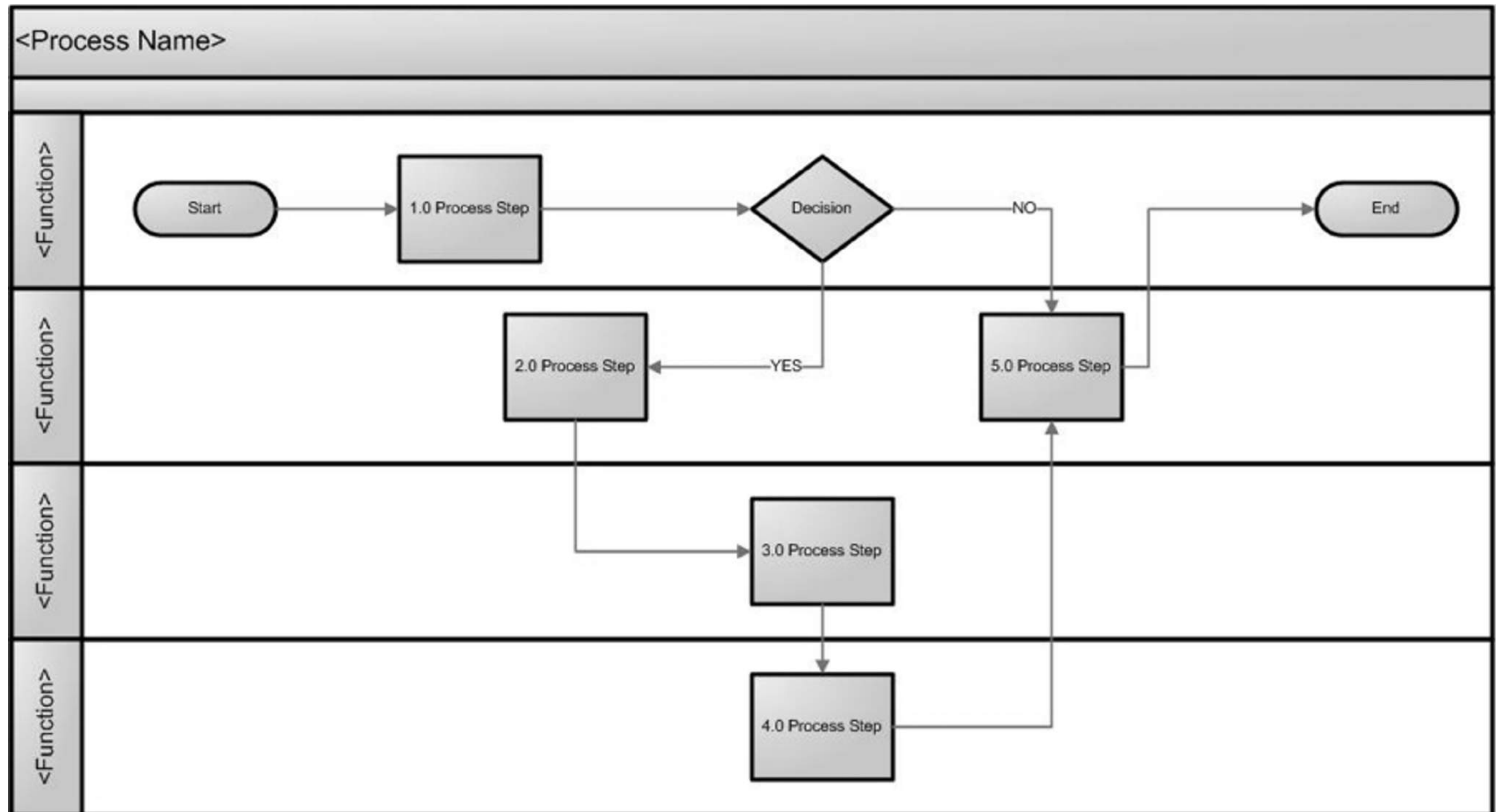
Process mapping



Process mapping



Process mapping





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Event

QUESTIONS & ANSWERS?

Ask Away.

ruth@dcmlearning.ie

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