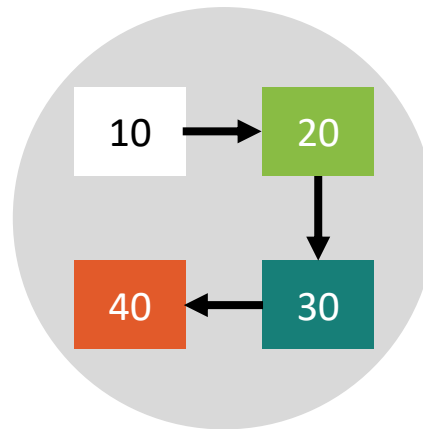


Continuous Improvement Toolkit

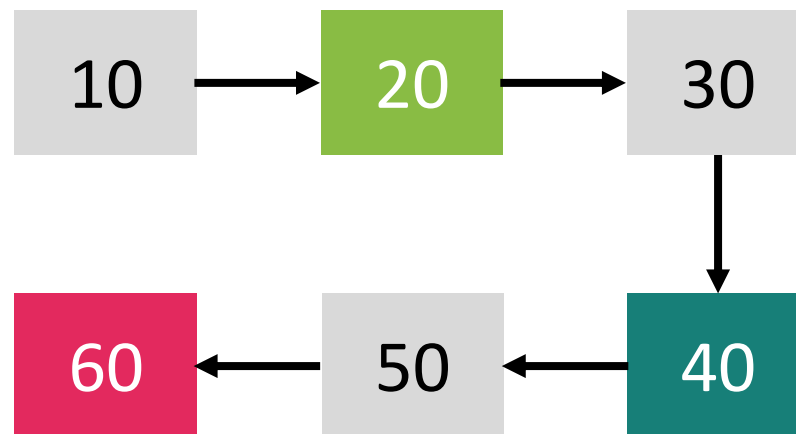
PROCESS MAPPING



PROCESS MAPPING

Process mapping is a **graphical** representation of the process.

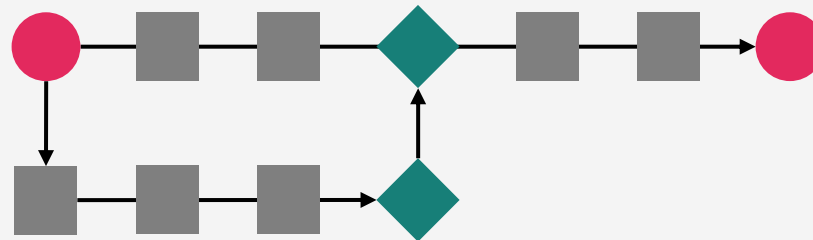
Illustrates the **chronological** sequence of activities and representing them in a step-by-step manner.



PROCESS MAPPING

They are simple ways of **making sense** of what happens or should happen in a process.

They allow to know how exactly an organization does its work, how a process operates, and how well it is performing in accordance with its objectives



PROCESS MAPPING

Characteristics of Process Maps

The **first step** of process management

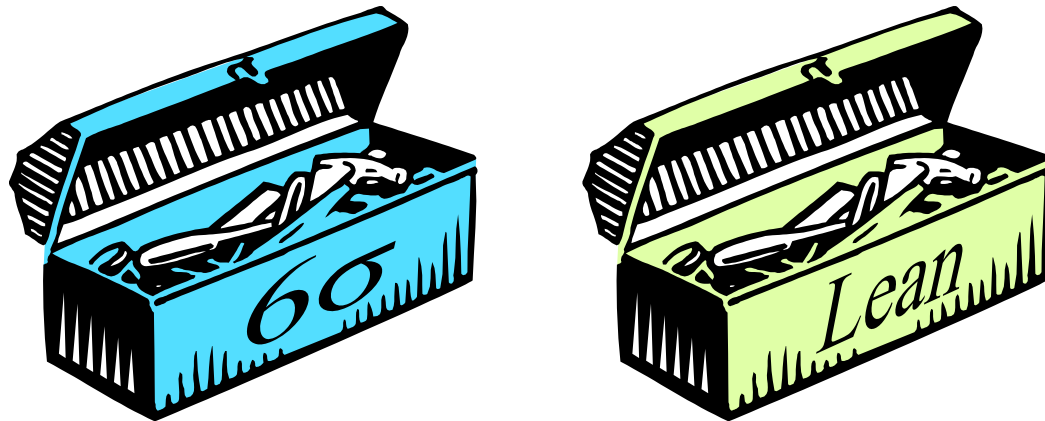
Provides a mechanism for analyzing and **studying processes**

Used to map **existing** processes as well as to design **new** processes



PROCESS MAPPING

Process maps help in identifying process variation, waste and non-value adding activities.

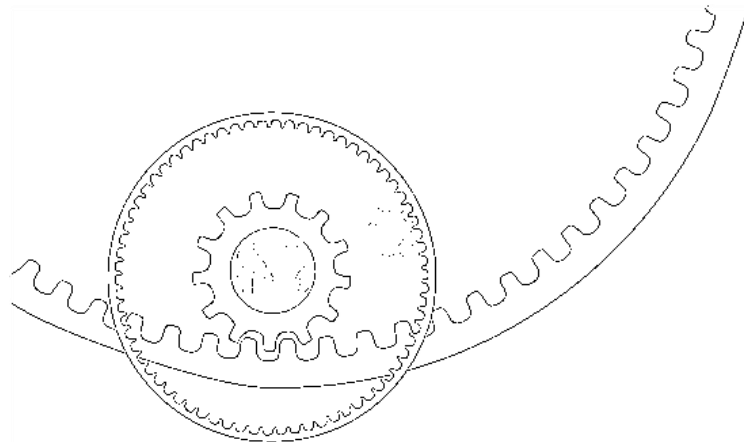


Enable the team to agree on the actions that they will take to improve or redesign the process

PROCESS MAPPING

The **preparation** of a process map is not a solution by itself.

It will however open opportunity to simplify, optimize, streamline, or redesign the process.



PROCESS MAPPING

01

Brings **clarity** to complex processes in order to simplify, streamline and optimize them

02

Identifies problem areas and **opportunities** for process improvement

03

Helps understanding and controlling the inputs to **reduce process variation**

BENEFITS

04

Helps identify **bottlenecks**, delays, duplication of effort, and overall inefficient operations

05

Serves as a mean to **document and communicate** business processes

06

Often found in training, maintenance, technical and **quality manuals**

07

Provides a way of **training** and orienting new employees

08

Identifies **optimal ways** to serve customers and shareholders

09

Helps creating **customer-focused** processes

PROCESS MAPPING

By analyzing processes, we will be able to:

- ▶ Improve process and product **quality**.
- ▶ Reduce delivery cycle time
- ▶ Reduce cost.
- ▶ Improve customer satisfaction and loyalty.



PROCESS MAPPING

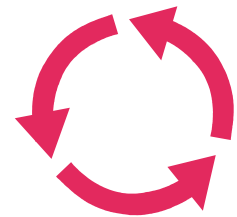
Process Characterization

Targeting and benchmarking of key process, product, and service characteristics resulting in selecting common success factors which lead to value creation.



Process Optimization

The measurement and improvement of the process variables resulting in process improvement.



PROCESS MAPPING

Process mapping can provide inputs to other continuous improvement **techniques** such as . . .

CAUSE AND EFFECT ANALYSIS

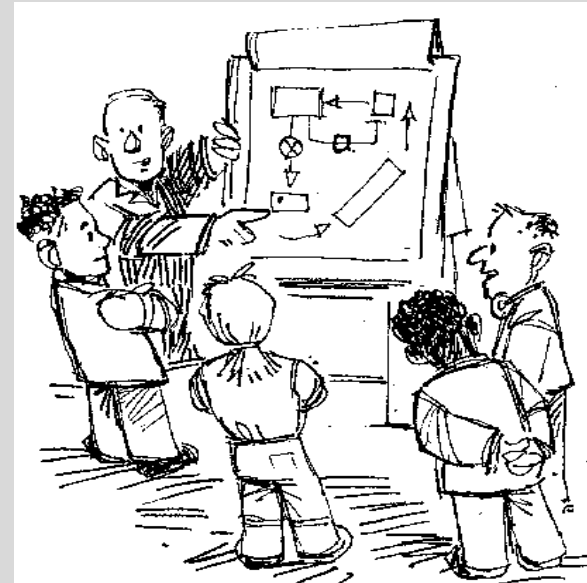
ROOT CAUSE ANALYSIS

MSA

CONTROL PLANS

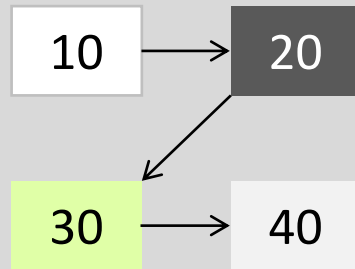
FMEA

CAPABILITY STUDIES

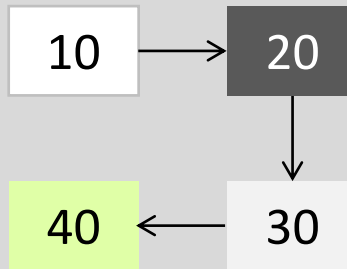


PROCESS MAPPING

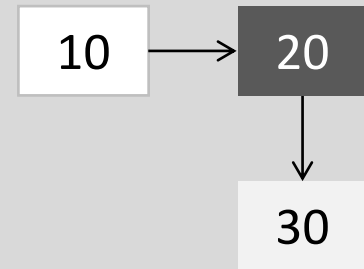
Three Process Perspectives



What you think
the process is



What the process
really is



What the process
should be

PROCESS MAPPING

There are different **techniques** to map a process . . .

Simple Drawing

SIPOC Map

Flowchart

Opportunity Map

Flow Process Chart

Process Chart

Value Stream Map

Flow Diagram

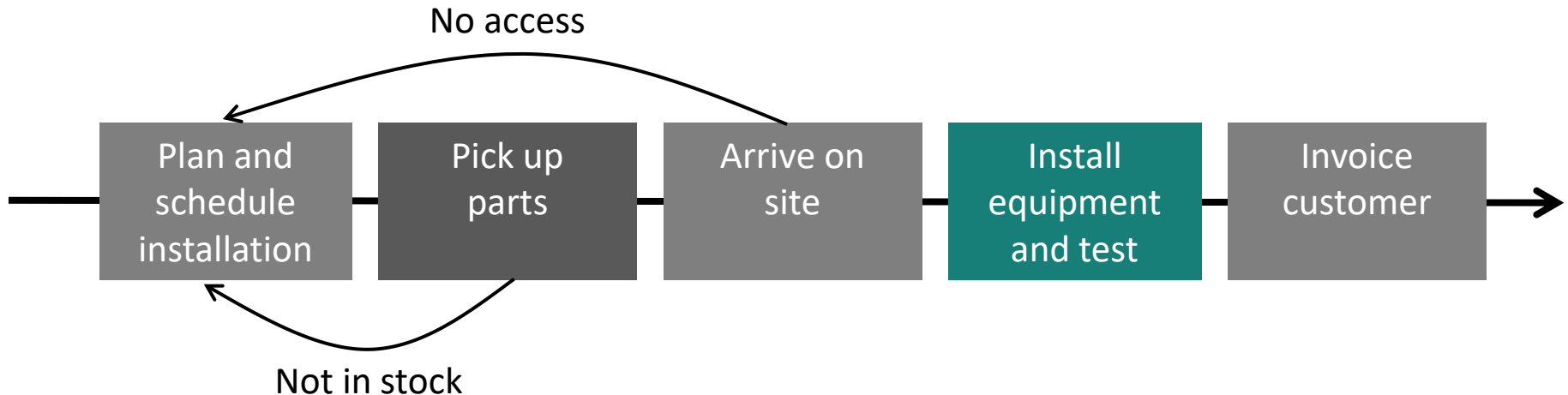
All these techniques can provide **different views** of the process

PROCESS MAPPING

There are different **techniques** to map a process . . .

Simple Drawing Process Map

Only uses **arrows** and **boxes** to represent activities

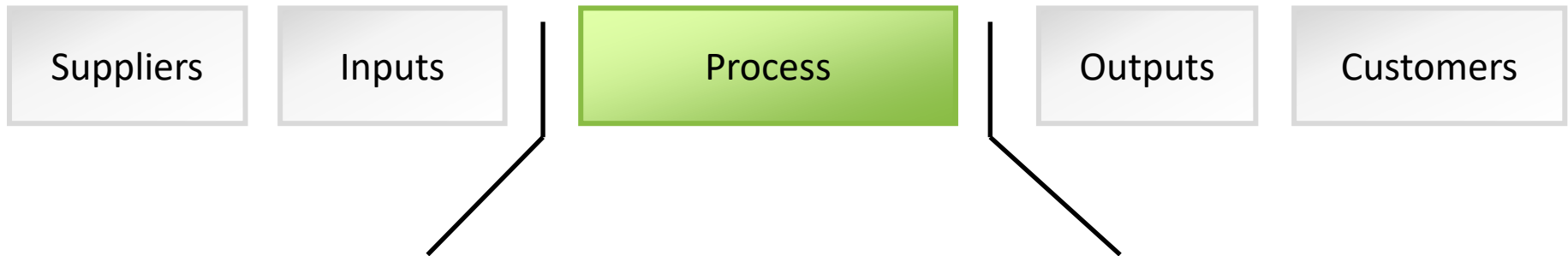


PROCESS MAPPING

There are different **techniques** to map a process . . .

SIPOC Map

A **high-level summary** of the process that lists suppliers, inputs, outputs and customers

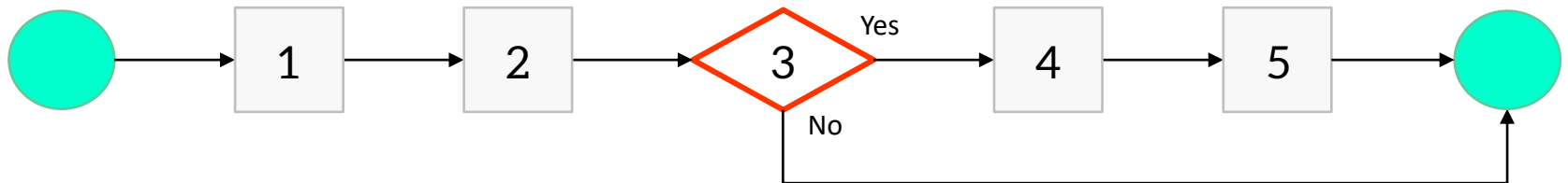


PROCESS MAPPING

There are different **techniques** to map a process . . .

Flowchart

Provides a detailed view of the “should-be” process including **decision points**

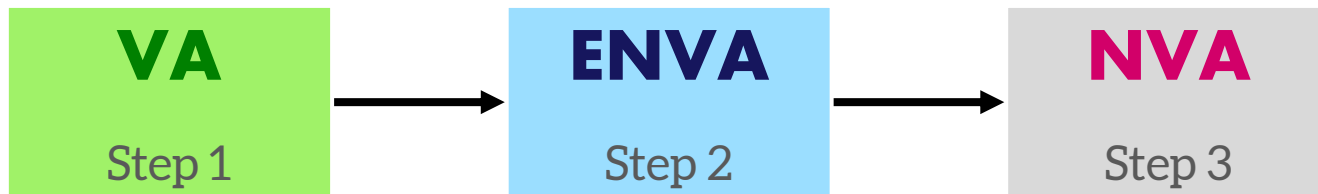


PROCESS MAPPING

There are different **techniques** to map a process . . .

Opportunity Map

Helps identifying waste, delays and other **non-value-added activities**

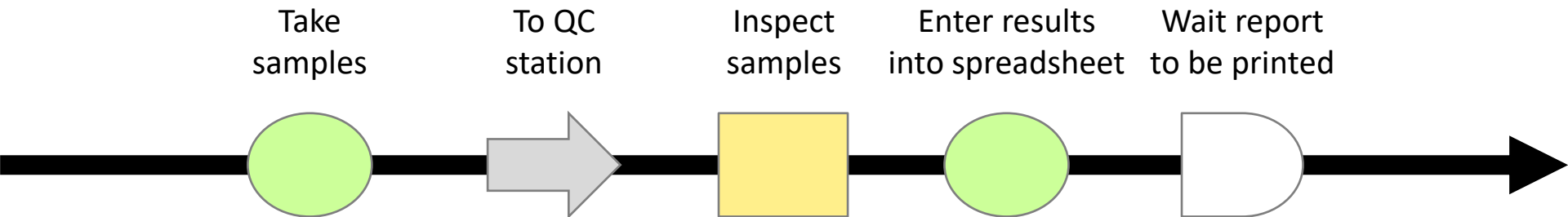


PROCESS MAPPING

There are different **techniques** to map a process . . .

Flow Process Chart

Provides a way to identify the non-value-added activities including the time taken and the distance traveled per step








PROCESS MAPPING

There are different **techniques** to map a process . . .

Process Chart

Allows to provide **further information** about each process step including time and distance

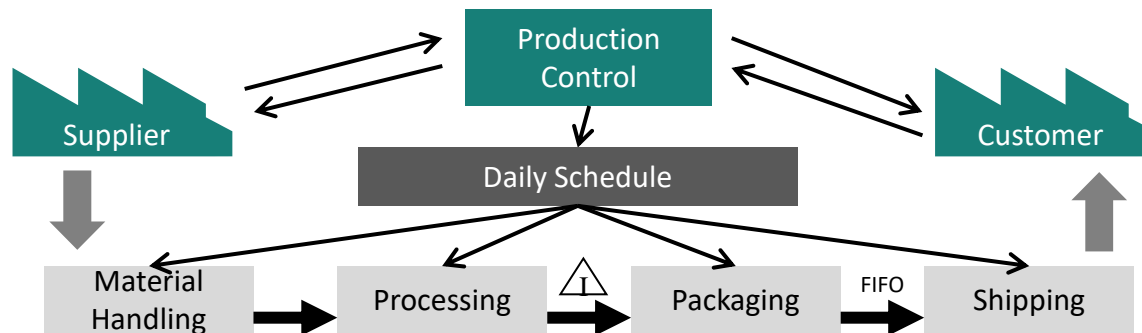
Step #	Time IN MINS	Distance IN METERS						Process description

PROCESS MAPPING

There are different **techniques** to map a process . . .

Value Stream Map

Used to prioritize improvement opportunities by helping identify bottlenecks, delays and waste

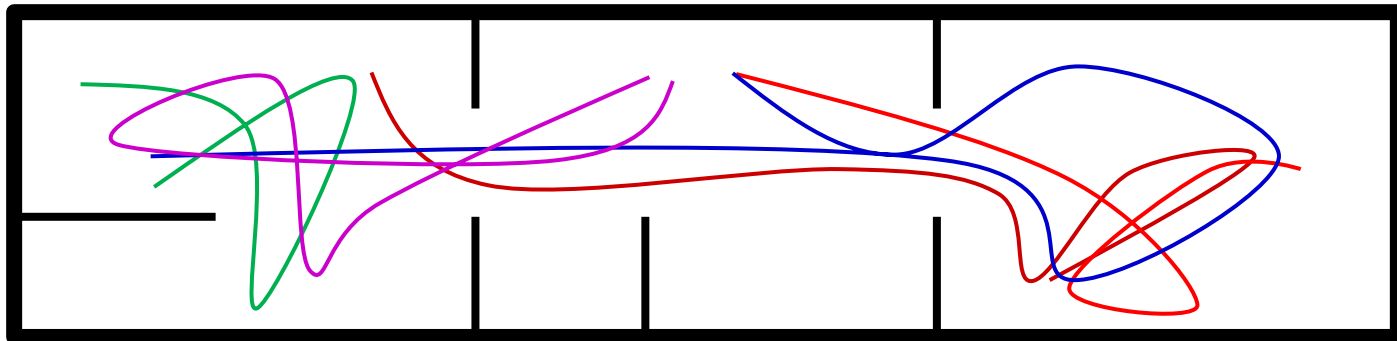


PROCESS MAPPING

There are different **techniques** to map a process . . .

Flow Diagram

Depicts **patterns of movement** of product, materials, tools information and people





PROCESS MAPPING

So which process mapping technique is best?

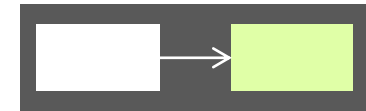
Process Map
Value Service Blueprint
Simple Drawing Opportunity
Swimlane Activity
Flow Diagram SIPOC
IDEF
Flowchart
Flow Spaghetti Value Stream Map
UML Cross-functional
Process Time Value Map
Chart



PROCESS MAPPING

It depends on what you want to achieve

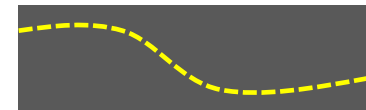
Simply presenting the activities



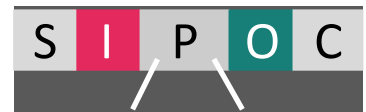
Understanding layout issues



Expanded look at where value is added

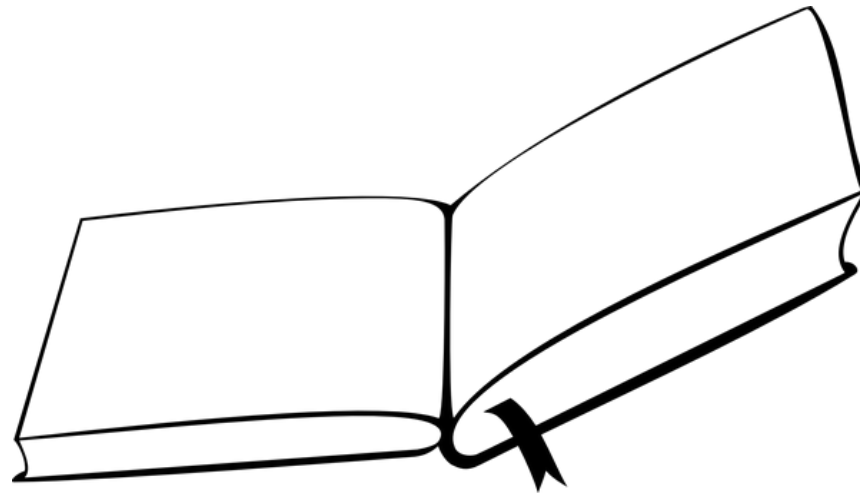


Show the high-level of the process



PROCESS MAPPING

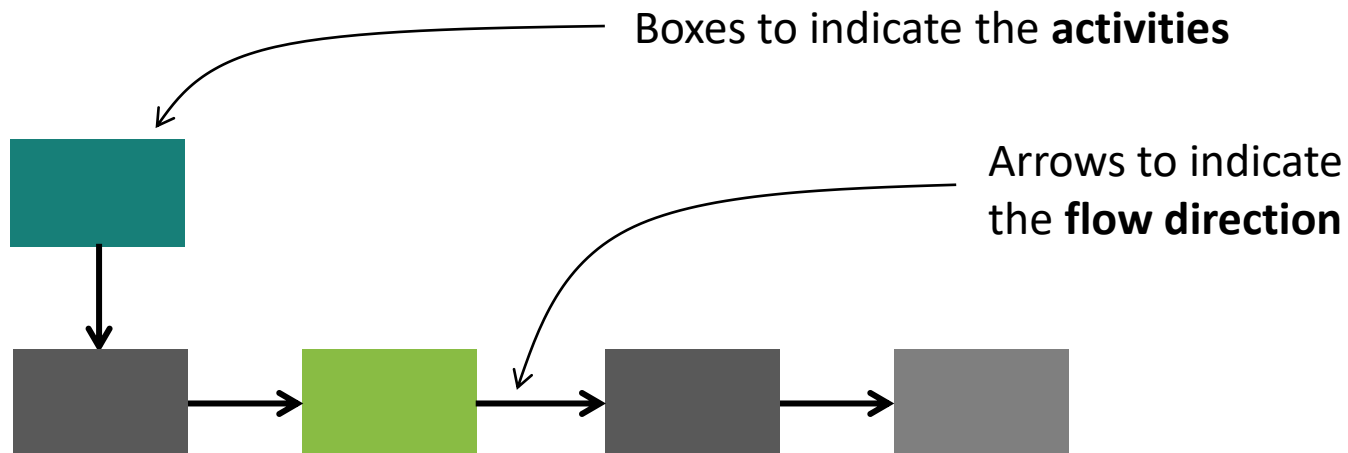
From this point until the end of the material, we will use the **simple drawing process maps** to illustrate the examples.



PROCESS MAPPING

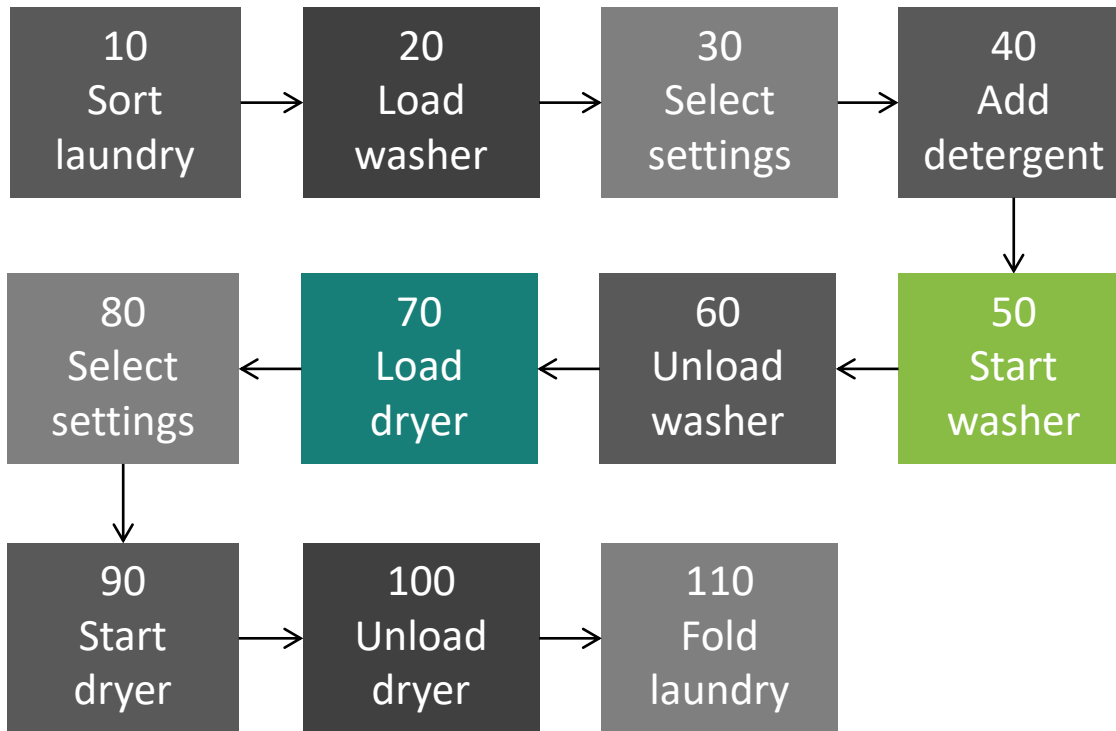
Simple drawing is the most **basic form** of process maps which uses only boxes and arrows.

Additional information can be added to each activity such as time and responsibilities.



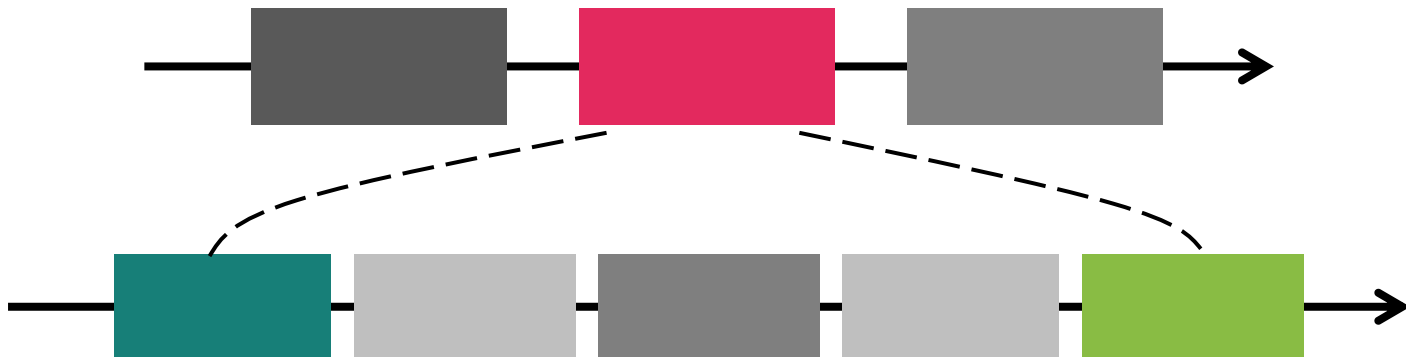
PROCESS MAPPING

Example – Doing the Laundry



PROCESS MAPPING

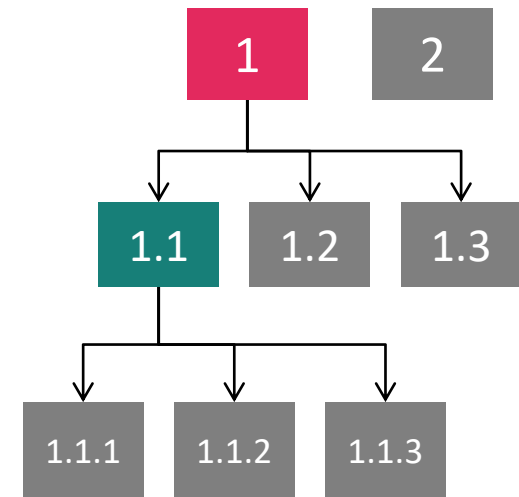
Just like real maps, process maps can be created for **different levels** in the organization. Each process step can itself be decomposed into several sub-steps.



PROCESS MAPPING

Every business process can be described at different levels of detail.

- ▶ **At the strategic level**, they often show the core processes only and would not have much details.
- ▶ In order to understand a process step in sufficient detail, you need the **detailed view** of that specific process step.



PROCESS MAPPING

CORE PROCESSES



L1

SUB PROCESS



L2

SUB-SUB PROCESS



L3



DOWN TO THE TASK LEVEL

PROCESS MAPPING

The level of detail varies depending on the needs.

Executives are more interested in the highest of the organization

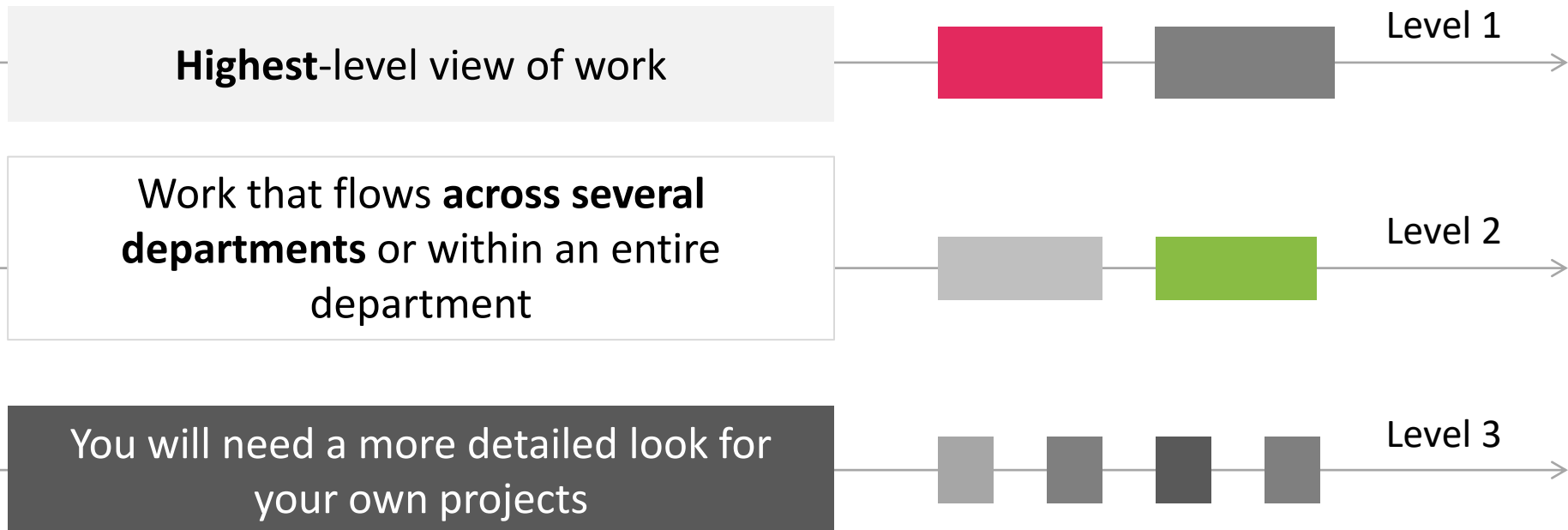
Seeing the **big picture** can also help understanding how your work fits into the organization's work as a whole

A detailed view of a specific process



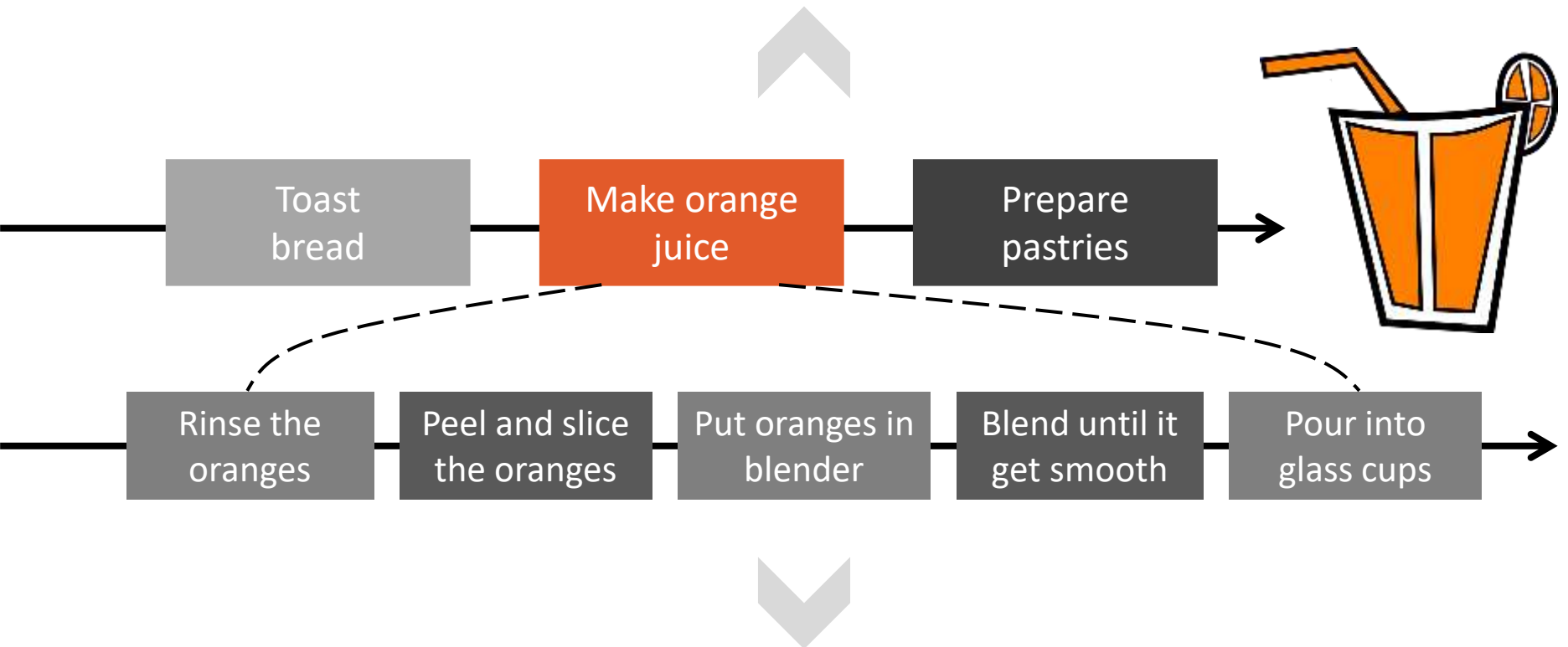
PROCESS MAPPING

Work at the level that makes sense for **your situation**.



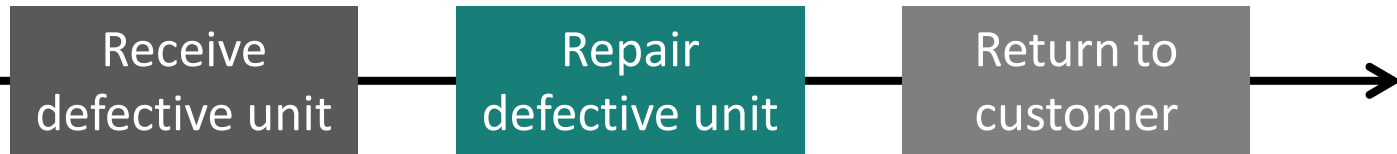
PROCESS MAPPING

Example – Making Orange Juice

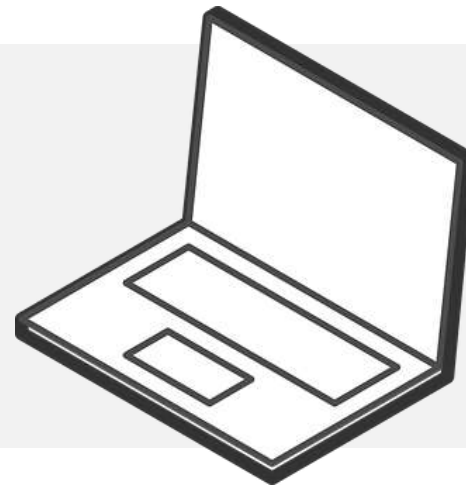


PROCESS MAPPING

Example – Repairing a Defective Unit

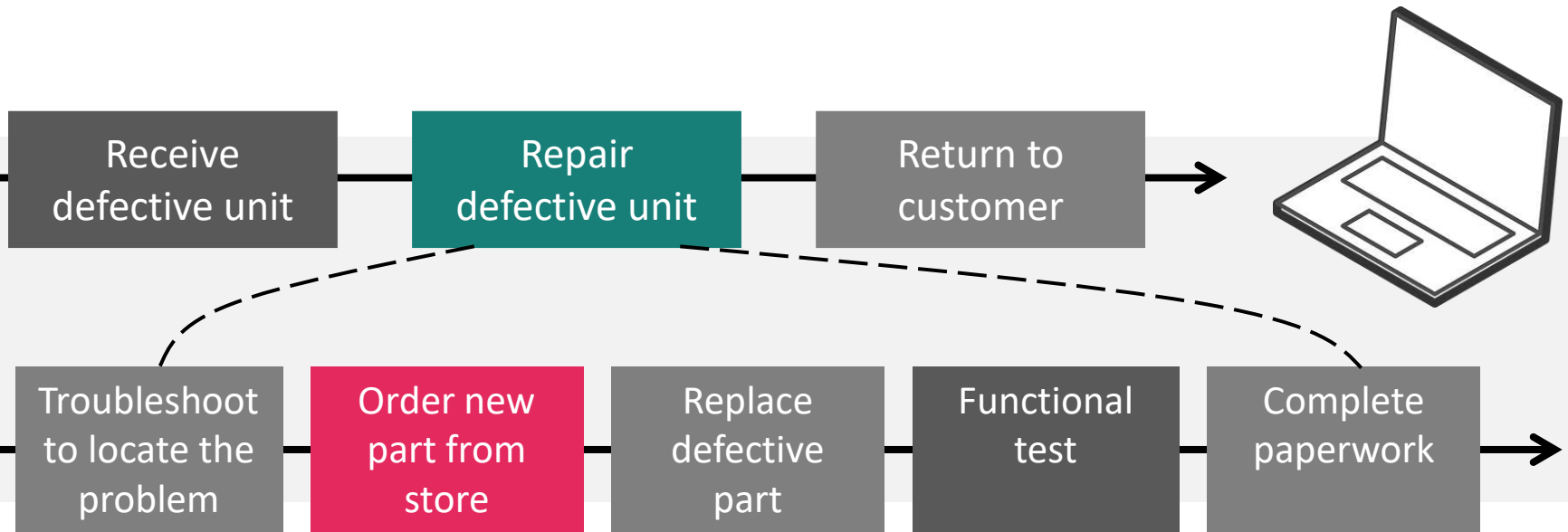


This is a process map for repairing a defective unit after **received by a customer**



PROCESS MAPPING

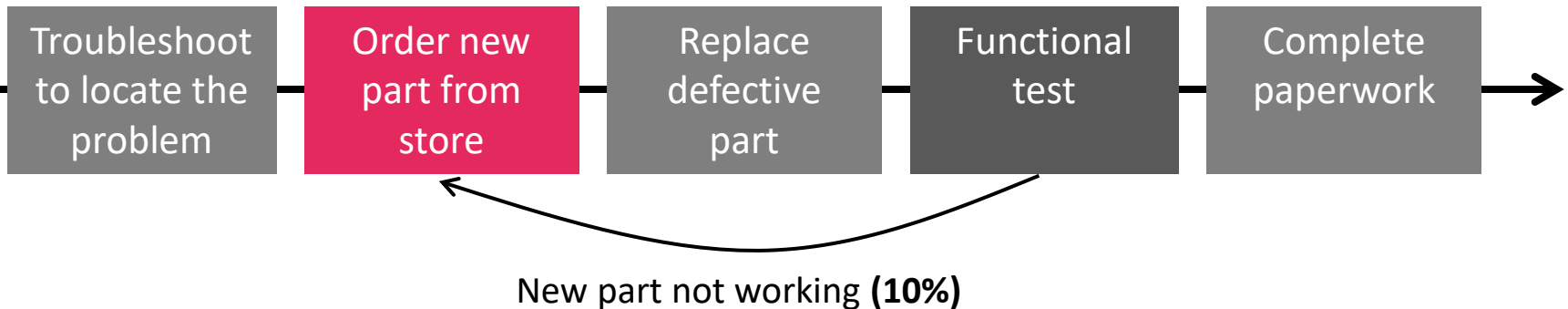
Example – Repairing a Defective Unit



Only one process step has been mapped to the second level (the **area of interest**)

PROCESS MAPPING

Example – Repairing a Defective Unit

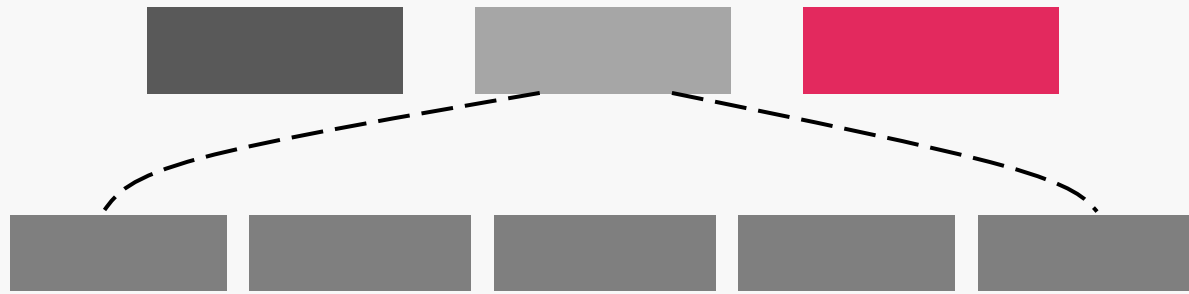


Notice the **rework loop** which occurs when it is discovered during testing that the installed part is non-functional

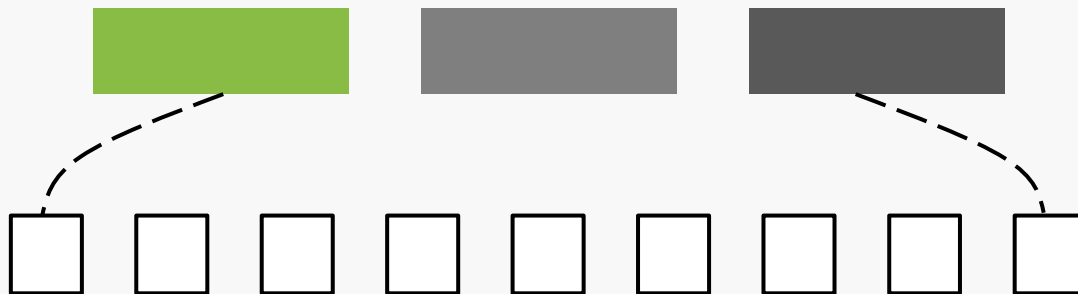
Will there be other rework loops or delays in this process?

PROCESS MAPPING

How Much is Enough?



Sub process
Vertical expansion

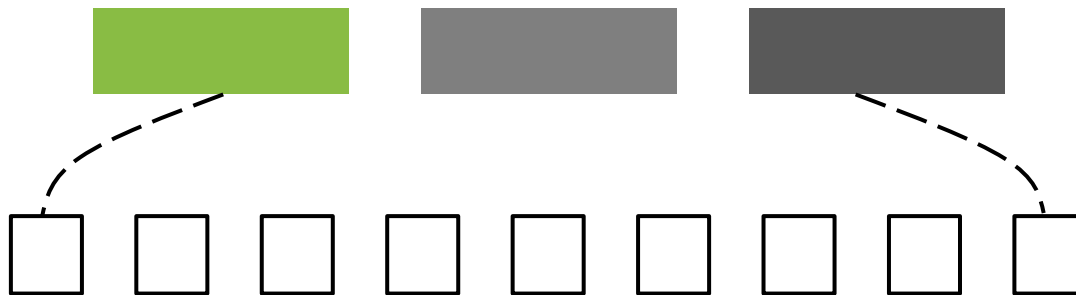


Detailed process
Horizontal expansion

The **amount of detail** varies depending on the needs

PROCESS MAPPING

How Much is Enough?



Sometimes you may **leave out** important details such as:

Steps taken when things
go **wrong**

The activities of **approving**
and decision making

PROCESS MAPPING

How Much is Enough?

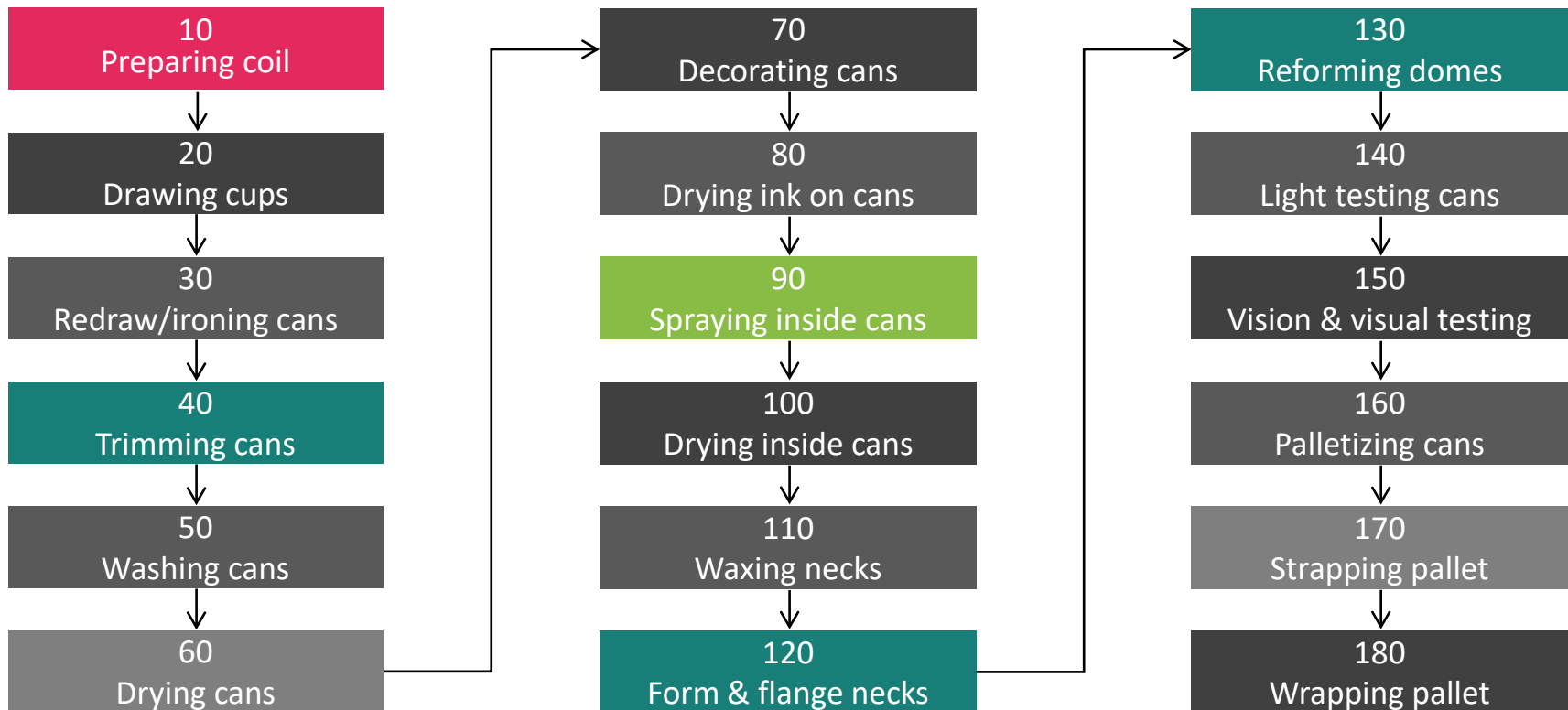
Makes a process map easier to create and interpret and useful when trying to quickly capture the **basic outline** of the process



Takes longer to create but shows more accurately how the process really works

PROCESS MAPPING

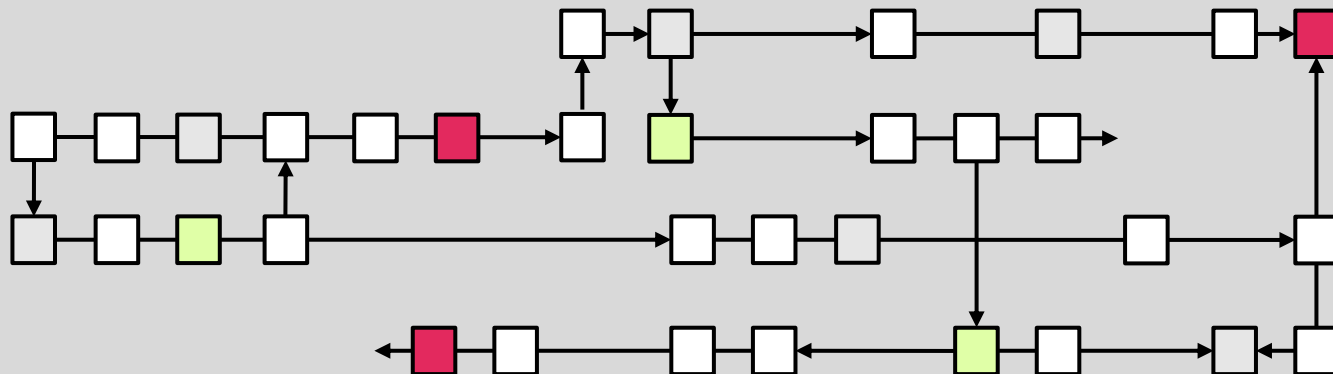
Example – Can Making Process Map



PROCESS MAPPING

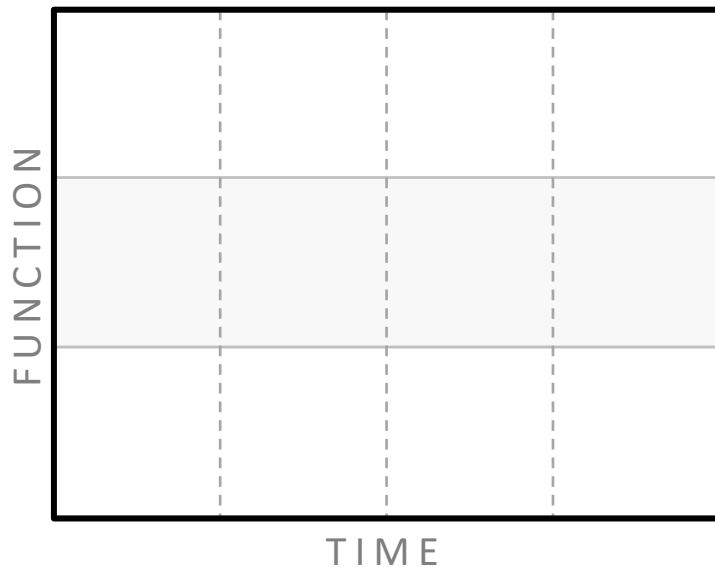
Process maps can quickly become **long and complicated** when there is much details to show.

You may need to present everything in more than one page. Later, you may need to redo the map for clarity.



PROCESS MAPPING

Other Process Mapping Formats



Time-function Mapping

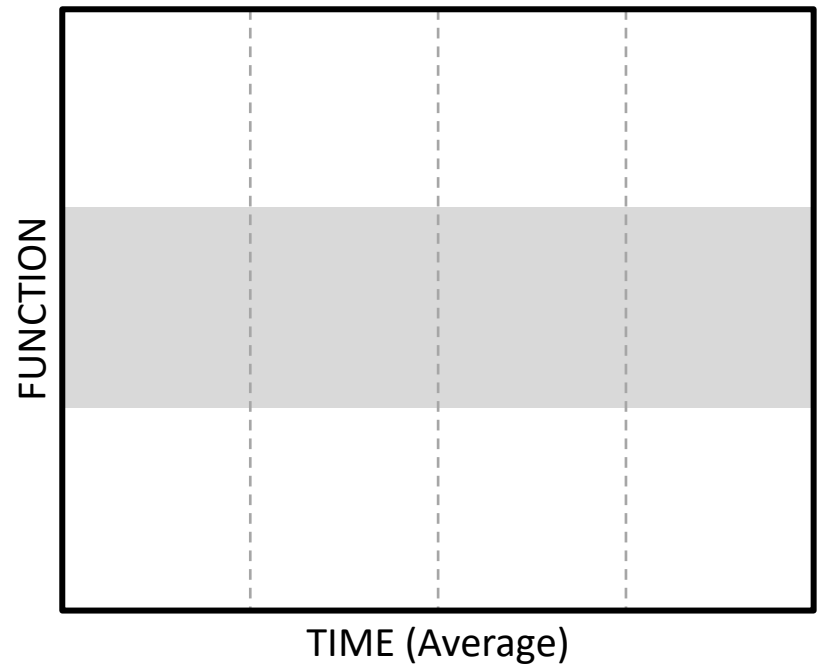
Flow	Dept.	X	Y	KPI	Time
1					
↓					
2					
↓					
3					

Process Map Table

PROCESS MAPPING

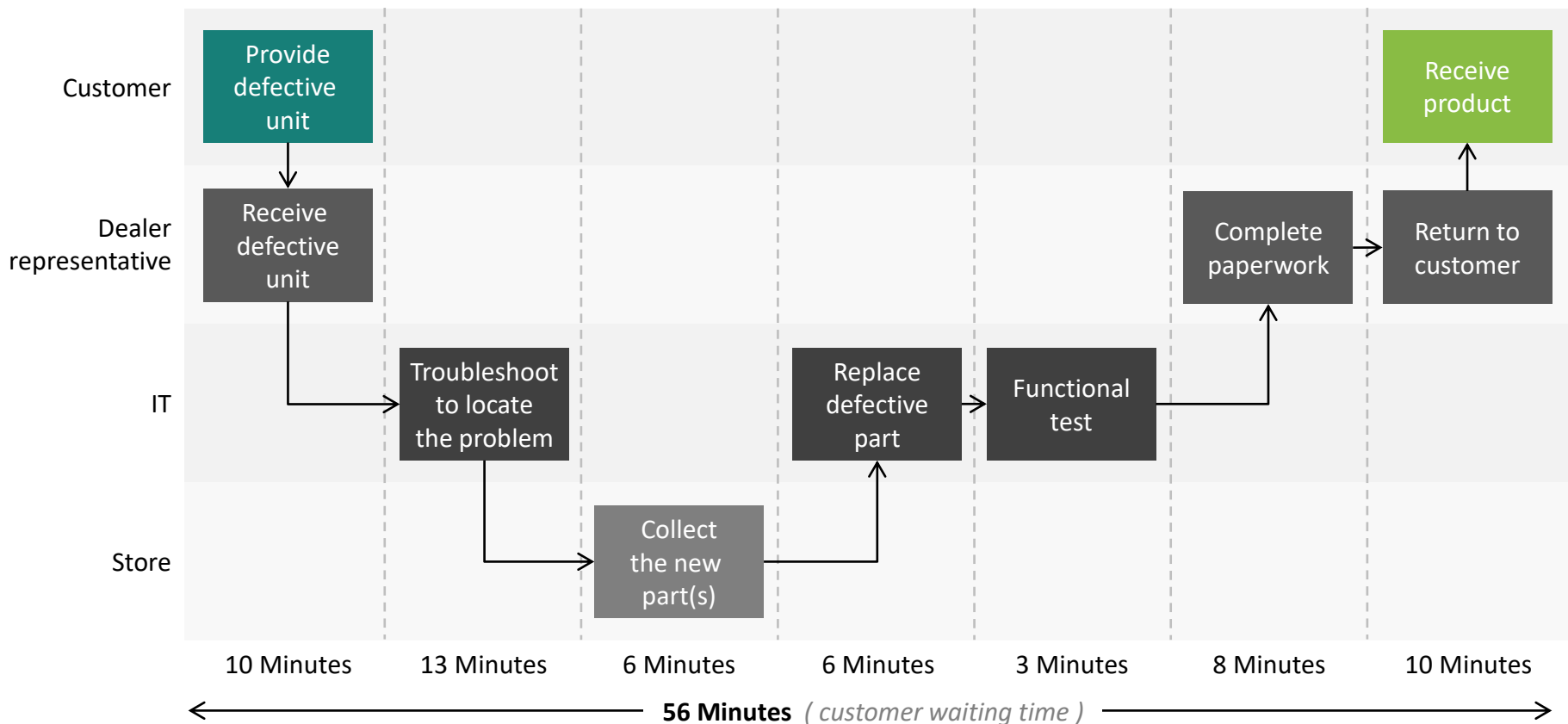
Time Function Mapping

- ▶ A process map with the **time added** on one axis and the function on the other axis.
- ▶ Can be made for the baseline process as well as for the future process.
- ▶ Helps to identify and eliminate waste such as delays.



PROCESS MAPPING

Example – Waiting Time to Repair Defective Units

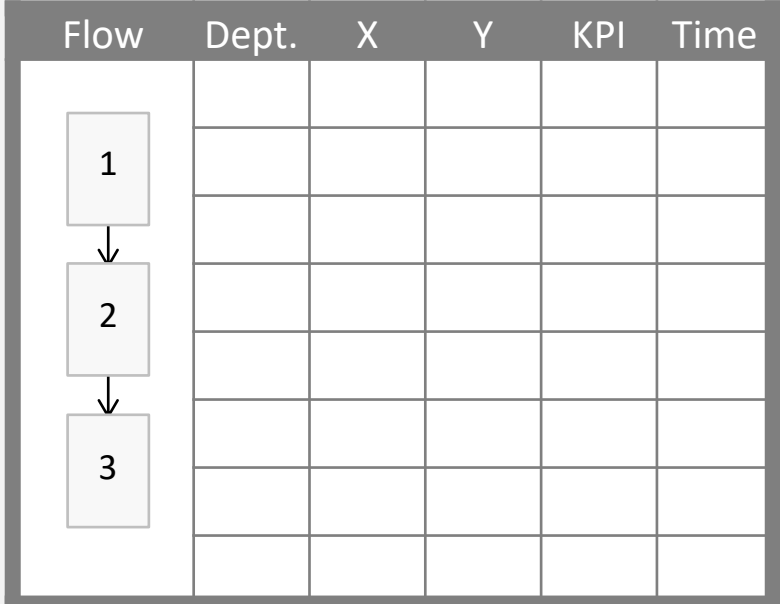


PROCESS MAPPING

Process Map Table

More information can be displayed in process maps . . .

- ▶ The time it takes to perform each activity.
- ▶ The responsible person for each activity.
- ▶ Activity inputs and outputs.
- ▶ Key performance indicators.



Flow	Dept.	X	Y	KPI	Time
1					
↓					
2					
↓					
3					

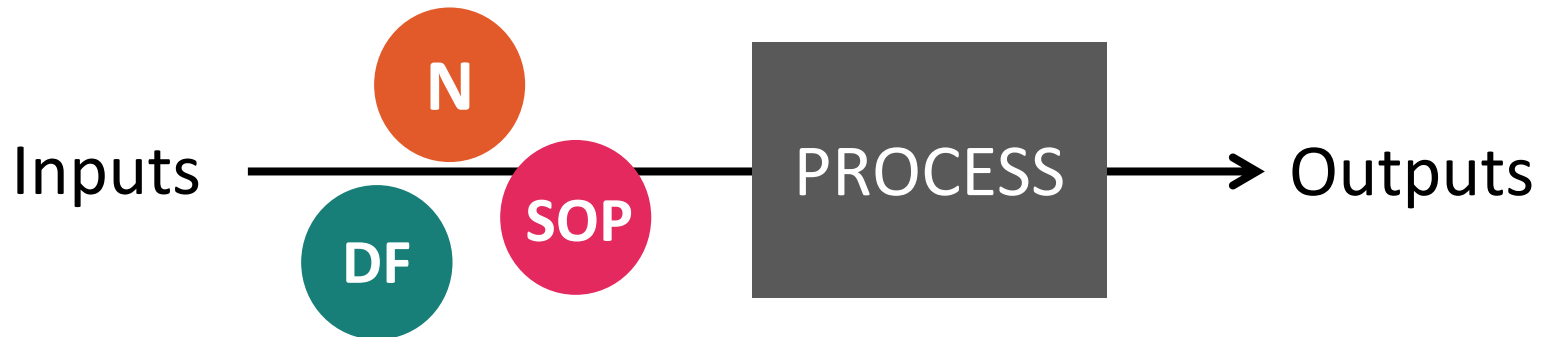
PROCESS MAPPING

Example – Hotel Check-Out

Process flow	Description	Department Responsible		Inputs	Outputs	Key metrics	Time range
1	Greet the guest and ask about stay	Front office	Front desk agent				
2	Check guest balance	Front office	Front desk agent	Reservation number	Guest balance	Time to prepare invoice	0.5 – 1.5 minutes
3	Prepare invoice for guest	Front office	Front desk agent		Invoice print out		
4	Collect payment	Front office	Front desk agent	Payment			
5	Handover invoice copy	Front office	Front desk agent		Enveloped invoice		
6	Request guest to fill out satisfaction survey (Get his/her consent)	Front office	Front desk agent	Satisfaction survey	Completed survey	Satisfaction rate	2.5 – 4.0 minutes
7	Thank the guest	Front office	Front desk agent				
8	Update room status	Front office	Front desk agent	Room number	Room status		

PROCESS MAPPING

One of the main benefits of a process map is to identify key process input variables that cause high variability in the process.



By understanding and controlling the inputs, it is possible to reduce variation within the process

PROCESS MAPPING

Identify all factors that are present for each of the process steps, including the . . .

N

Noise factors

SOP

Standard factors

DF

Design factors

$$Y = F(X)$$

Key process input variables (KPIV's) are the input variables that have significant impact on the variability of the process

PROCESS MAPPING

Input variables are classified into three categories

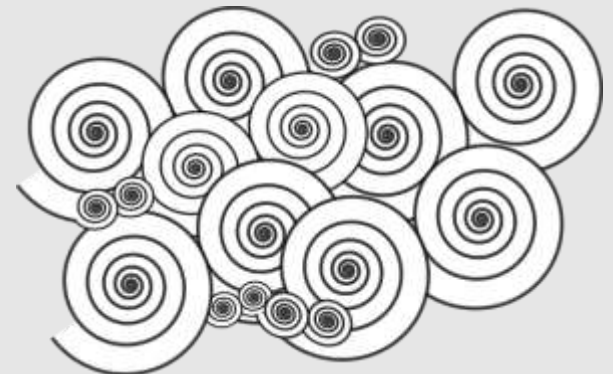
Uncontrollable, costly or preferably not to be controlled factors.

Good to know how to compensate changes in these factors.

Examples:

- ▶ Environmental and cultural factors.

Noise factors



PROCESS MAPPING

Input variables are classified into three categories

Have been standardized according to some operational requirements.

Record and know how often they are out of control.

Examples:

- ▶ Safety and preventive maintenance factors.

Standard factors (SOPs)



PROCESS MAPPING

Input variables are classified into three categories

The controllable factors that can be adjusted and controlled.

This area is where we need to focus our efforts to improve the process.

Examples:

- ▶ The speed of a machine and the ingredients of a recipe.

Design factors

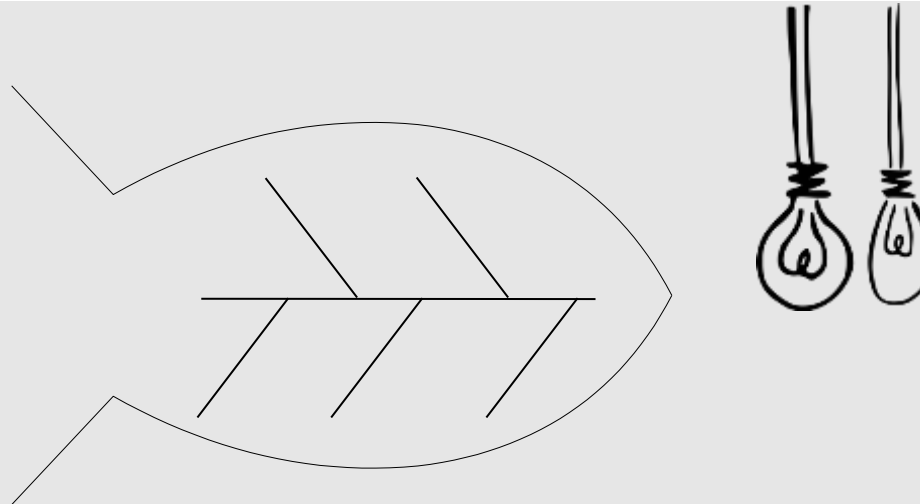
DF



PROCESS MAPPING

Input variables are classified into three categories

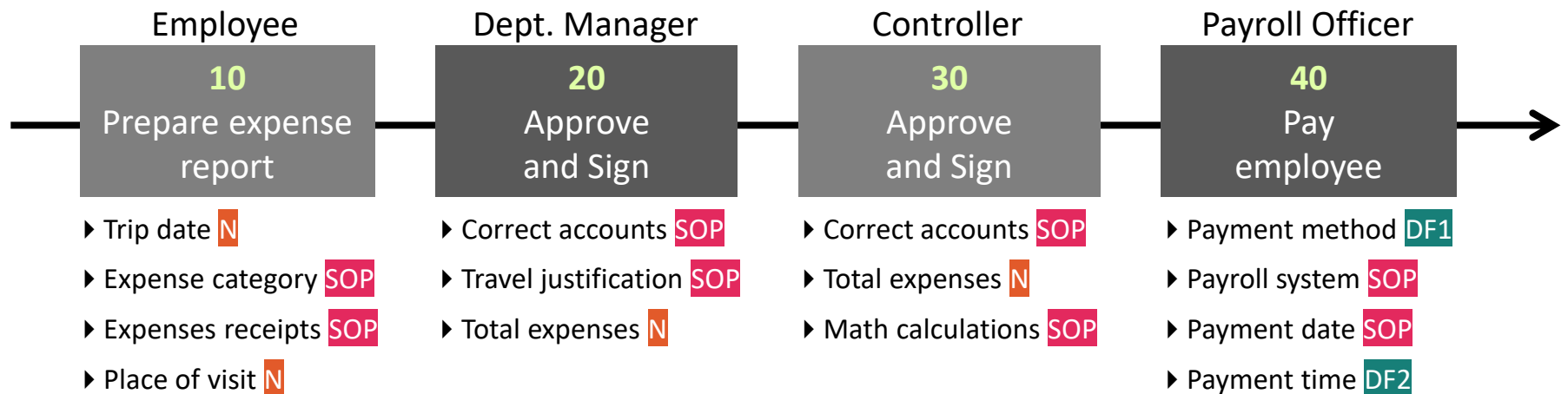
There is a fourth factor! the **'never thought of before'** factors





PROCESS MAPPING

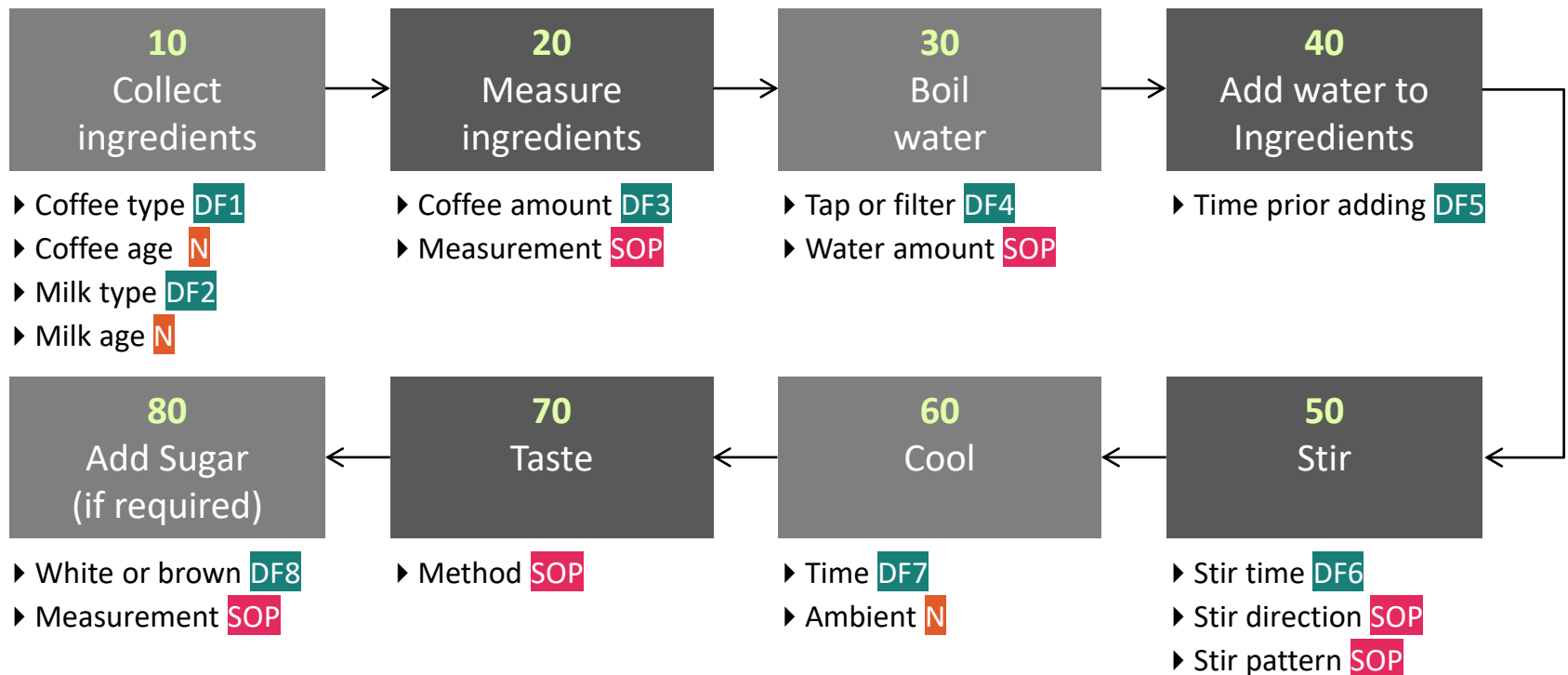
Example – Process an Expense Report



How many **controllable** sources of variation do we have here that could have an influence on the performance of the process?

PROCESS MAPPING

Example – Making Coffee



Output variables can also be identified

PROCESS MAPPING

How to Construct a Flowchart

Gather the team and make sure that everyone is clear on **what process** is going to be mapped

Identify external customers and/or suppliers

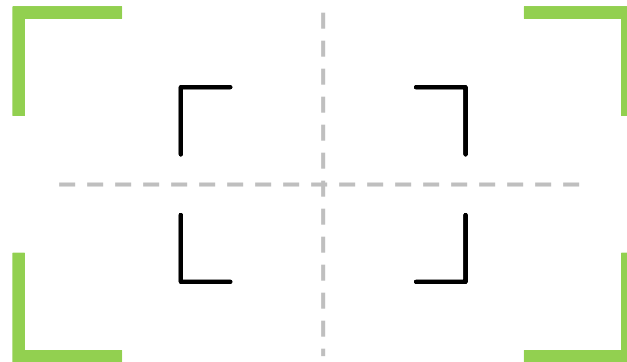


PROCESS MAPPING

How to Construct a Flowchart

Agree on the mapping **technique** to be used, and on the appropriate scope and boundaries

Agree also on the level of detail

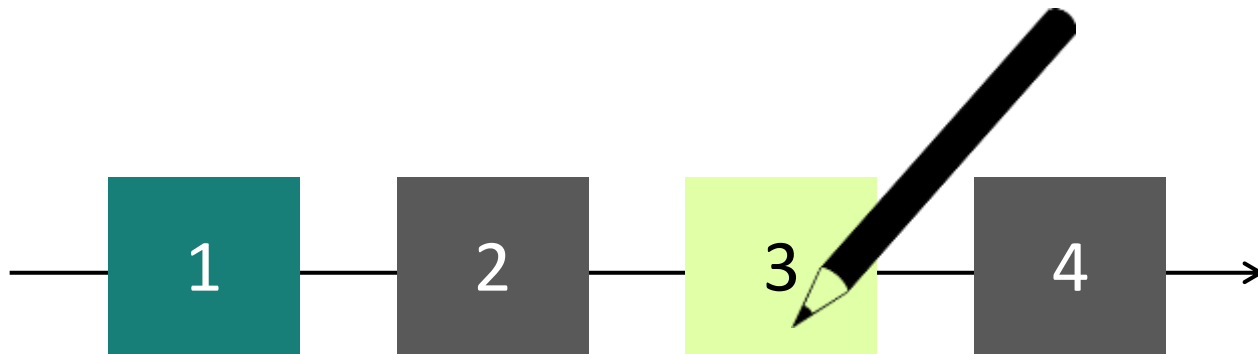


PROCESS MAPPING

How to Construct a Flowchart

Generate the '**As-Is**' process map from beginning to end

Identify all major process activities and the sequence of completion

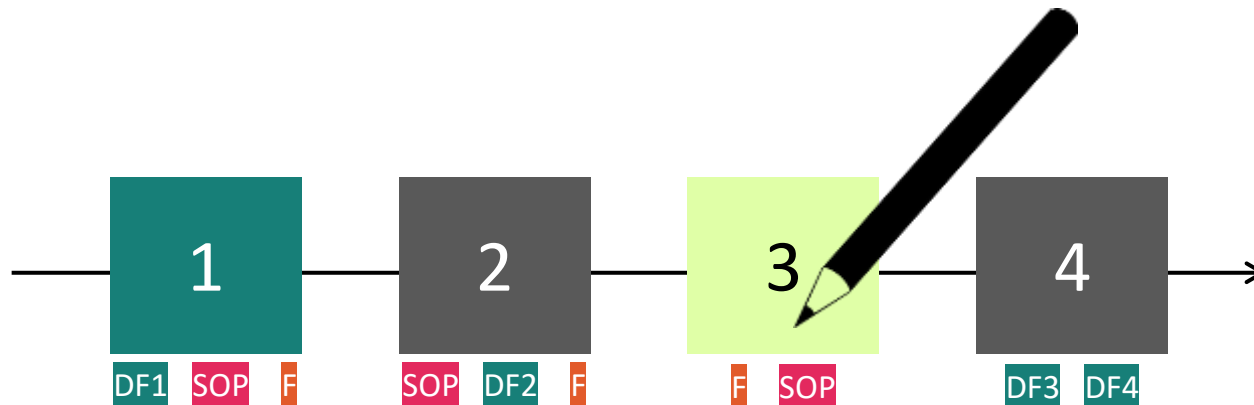


PROCESS MAPPING

How to Construct a Flowchart

Add **further details** as necessary, and classify each input variable as Design, Noise or SOP

This will help focus on those inputs that are controllable



PROCESS MAPPING

How to Construct a Flowchart

Analyze the process map and identify problem areas and improvement opportunities

Consider delays, duplication, errors, inefficiencies and other non-value-added activities

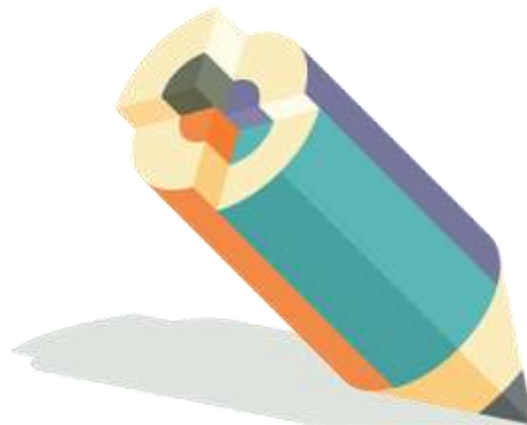


PROCESS MAPPING

How to Construct a Flowchart

Plan and implement actions to reduce variation and improve the process

Build the 'Should-Be' process map that corrects the inefficiencies and waste identified earlier



PROCESS MAPPING

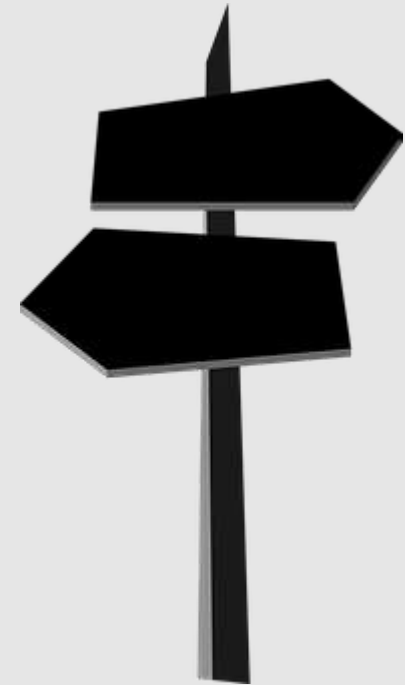
Tips

Clarify process **boundaries**

Number your process steps

Use **brief** description to describe each activity

Whenever possible start with **verbs**



PROCESS MAPPING

Potential Pitfalls

Mapping
without a clear
purpose

Lost in the
details

Not verifying
the facts

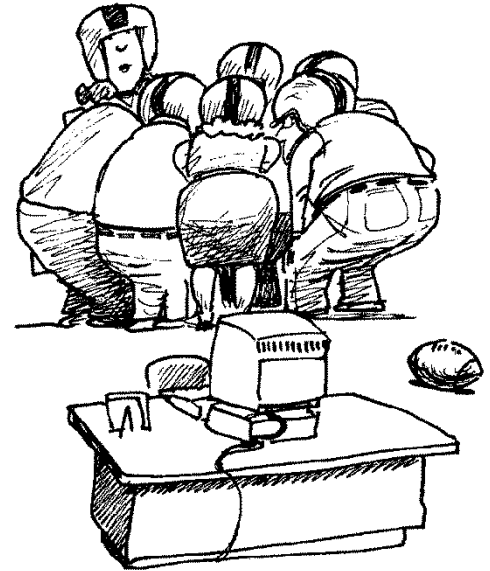
Hidden bias or
agenda



PROCESS MAPPING

Further Information

- ▶ The exercise of mapping your company processes can clarify your and your team's understanding of the work.
- ▶ It's always recommended to **walk the process** before you draw your process map to get an overview of the process and identify the boundaries.



PROCESS MAPPING

Further Information

Supportive Questions



Are all activities **necessary**?

Are things done in the right **sequence**?

Does **information** arrive on time?

Are there **rework loops** where activities are repeated?

Could these **rework loops** be eliminated?

Can any **paperwork** be eliminated?

Are there times when **waiting** is involved?

How can **waiting** be reduced?

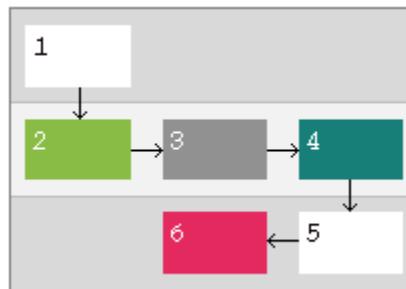
Are there any **quick wins** possible?

PROCESS MAPPING

Further Information

Process Mapping Template

If several people are going to chart the processes, design a **template** to ensure that one language is being spoken.



PROCESS MAPPING

Further Information – Common Process Problems

Non-value
adding steps

Errors and rework

Duplication

Bottlenecks

Long cycle times

Excessive delays

Missing steps

Too many inspections

Complex procedures

Departure from
procedure

Dead ends

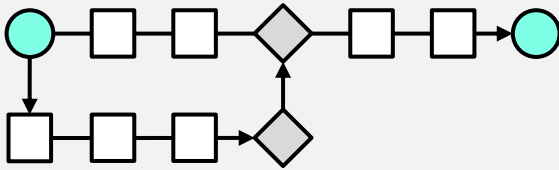
Costly steps

PROCESS MAPPING

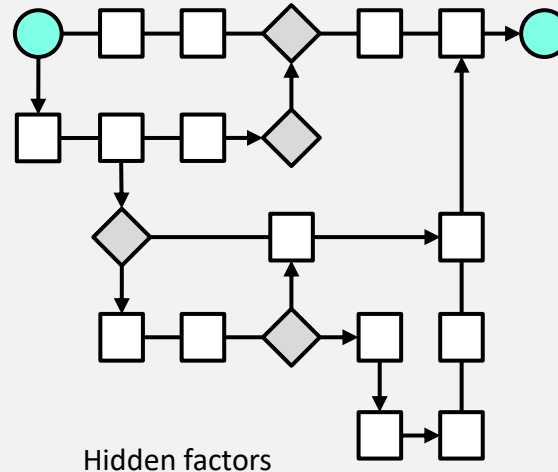
Further Information

What do we think of a process is not necessary what it actually is . . .

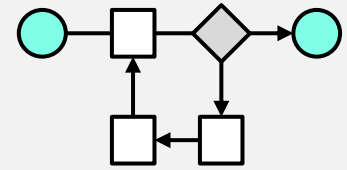
What you think it is?



What it actually is?



What you would like it to be?

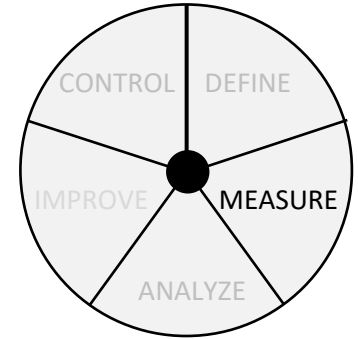


PROCESS MAPPING

Further Information – Measure Phase

The goal in this phase is to measure the present situation as it is. So, the process map should only contain what is really happening in the process.

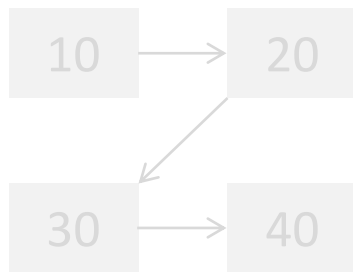
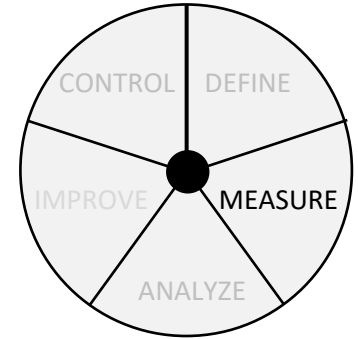
Here you are trying to clarify the steps in the process and create common understanding on how the process operates.



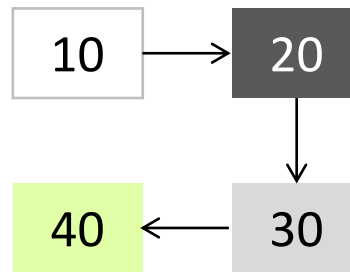
PROCESS MAPPING

Further Information – Measure Phase

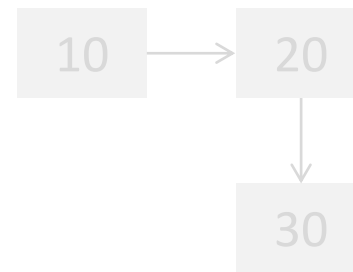
The goal in this phase should always be a process map of the process as it really is.



What you think
the process is



What the process
really is



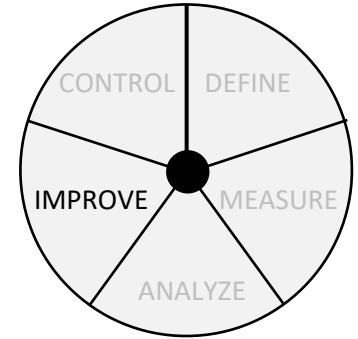
What the process
should be

PROCESS MAPPING

Further Information – Improve Phase

Process maps will help to describe the new solutions you want to test. The revised process will then be represented in the future state map.

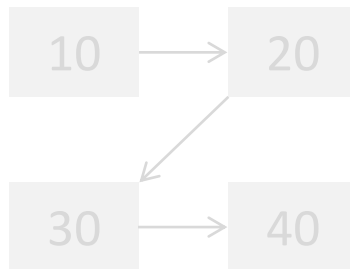
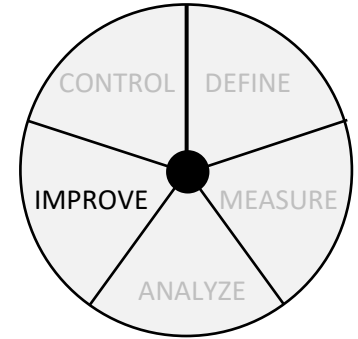
In **Control phase**, process maps will help to communicate the new state with others, and to teach people how to do the work.



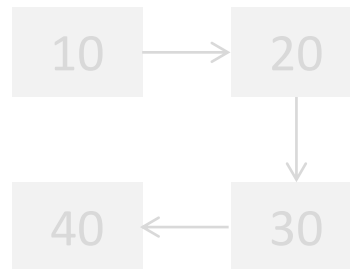
PROCESS MAPPING

Further Information – Improve Phase

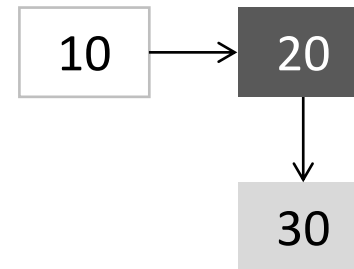
The goal in the Improve phase should help you implement solutions and standardize the new methods.



What you think
the process is



What the process
really is



What the process
should be

PROCESS MAPPING

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