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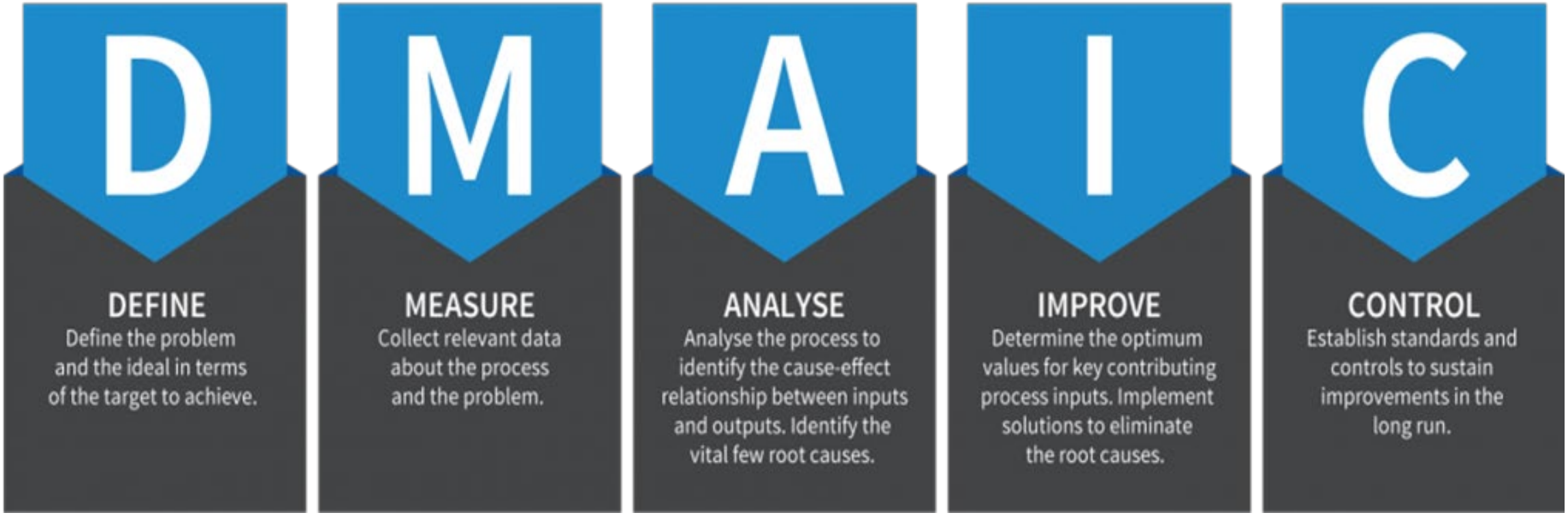
DMAIC – THE PATH TO CONTINUOUS IMPROVEMENT



DMAIC METHODOLOGY

The 5-Step DMAIC Methodology Explained		
Define	Using existing knowledge, specify as precisely as possible what is the problem to be solved and why.	Define ensures the team are all clear on what the problem is and that it is the right problem. Prevents the team jumping to solution mode.
Measure	Understand the current state – what happens in the process now and what is the true performance.	Data is used to confirm the magnitude of the problem and provide a baseline for a before-after comparison.
Analyze	Cause theories are developed. Process and data analysis tools are used to verify which are the root causes and how big their impact on the problem is.	Solutions which are targeted at root causes have a high likelihood of success.
Improve	Innovative solutions to the root causes are developed, tested and prepared for implementation.	Doing what we always do is what got us here!
Control	A control plan is put in place to ensure the improved process is successfully, permanently implemented. Data from the improved process is compared with data from Measure phase to verify the improvement is real and allows benefits to be quantified.	Powerful techniques like standardization, visual management and statistical process control are needed to enable a regime capable of sustaining the improvement. Verifying the improvement lets the business measure what has been achieved and, longer term, promotes the use of data based decision making.

DEFINE

DEFINE - ensures the team is all clear on what the problem is and that it is the **right problem**. The goal is to prevent the team jumping to solution mode.

DEFINE DELIVERABLES

- Communication Plan
- Project Charter
- SIPOC
- RACI Matrix
- S.M.A.R.T. Goal Setting
- S.W.O.T. Analysis Diagram

Continuous Improvement Communication Plan

Project Communication Action Plan						
Stakeholder	Message	Communicator	Schedule	Delivery Method	Status	Comments
Who will you communicate to?	*What is the topic of the message?*	*Who will the communication be from?*	*When will it happen and how often?*	*How will the communication be delivered?*	*What is the status?*	*Other important information*

Purpose and Benefits

- A communication plan provides a tool to provide stakeholders with information. This plan formally defines who should be given specific information, when that information should be delivered and what communication channels will be used to deliver the information. This tool should trigger dialog among key stakeholders.

How to use:

Stakeholders
- Process owner
- Champion
- Team members
- Key influencers
- People affected by change

Message
- When change will occur
- How change will impact them
- What information is needed
- What you need them to do

Communicator
- Key influencer
- Project leader
- Team member
- Champion
- Process owner

Schedule
- Appropriate timing within project

Delivery Method
- Method of communication

Status

Comments

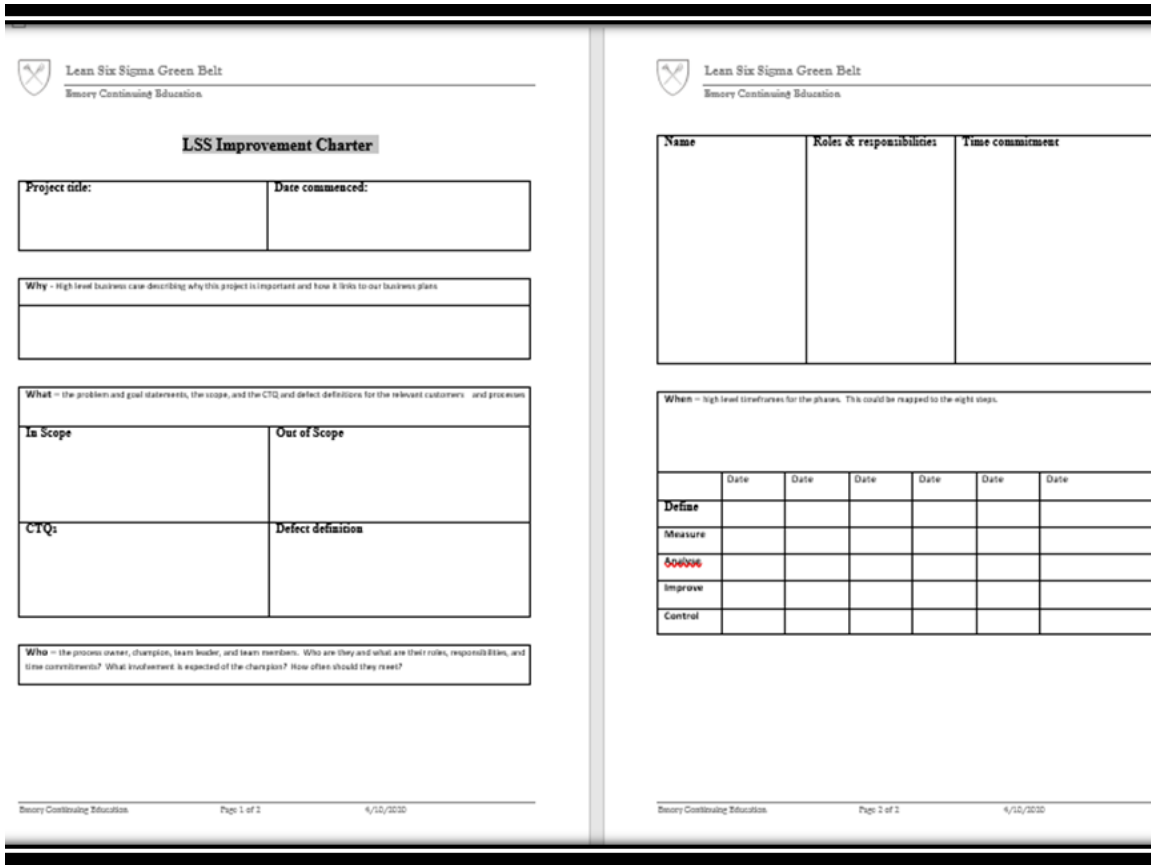
Communication Plan - TEMPLATE

Project Communication Action Plan						
Stakeholder	**Message**	**Communicator**	**Schedule**	**Delivery Method**	**Status**	**Comments**

Continuous Improvement Project Charter

Purpose and Benefits:

- The Project Charter should describe the continuous improvement initiative and should include the objectives, how it will be carried out, and who the stakeholders are. This document should clearly define the purpose, as well as the approach to achieve the stated goals and establish expectations around progress, deliverables, issue management, and roles and responsibilities.



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LSS Improvement Charter

Project title:	Date commenced:

Why - High level business case describing why this project is important and how it links to our business plans

What – the problem and goal statements, the scope, and the CTQ and defect definitions for the relevant customers and processes

In Scope	Out of Scope
CTQs	Defect definition

Who – the process owner, champion, team leader, and team members. Who are they and what are their roles, responsibilities, and time commitments? What involvement is expected of the champion? How often should they meet?

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Name	Roles & responsibilities	Time commitment

When – high level timeframes for the phases. This could be mapped to the eight steps.

	Date	Date	Date	Date	Date	Date
Define						
Measure						
Analyze						
Improve						
Control						

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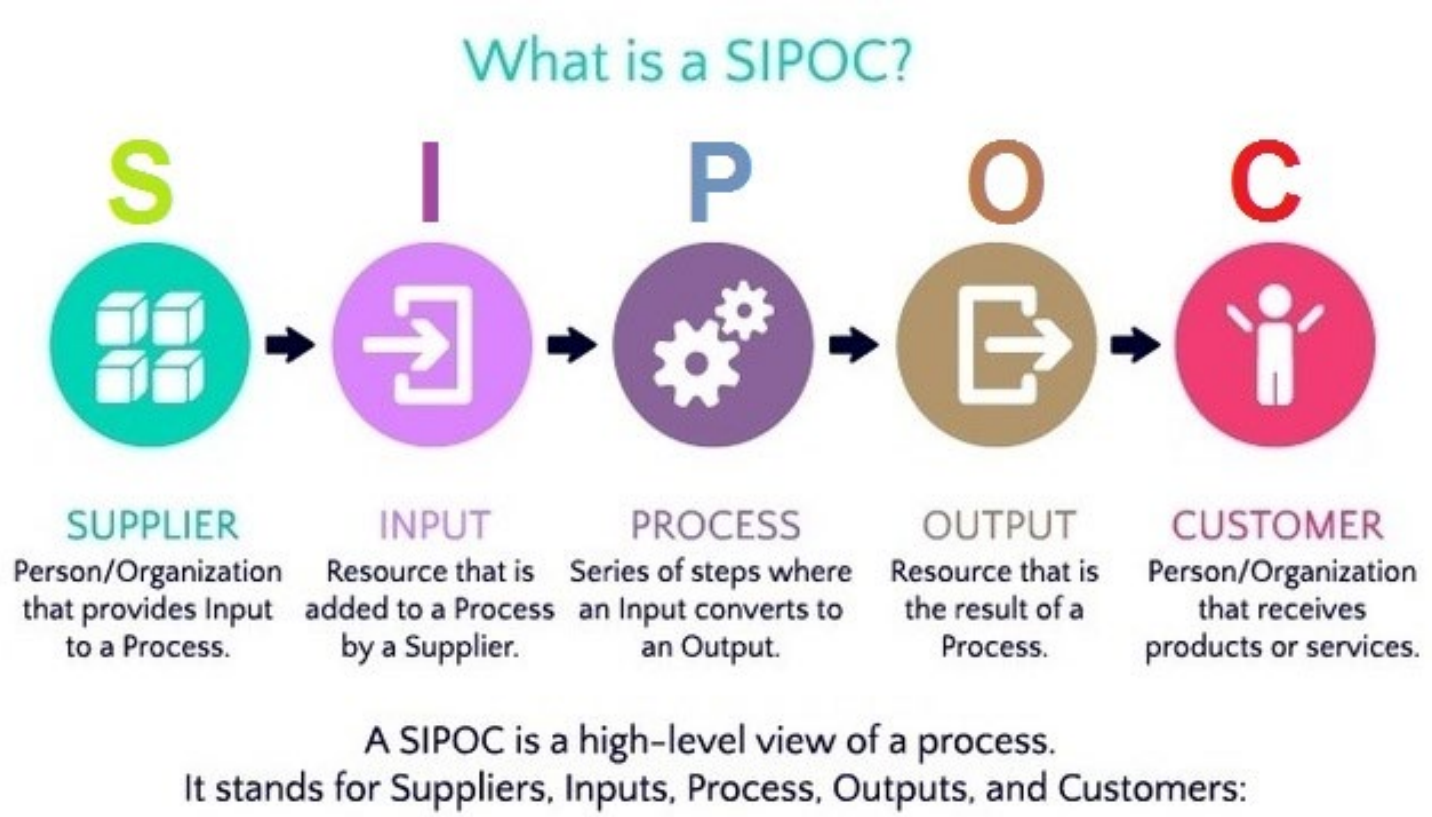
Project Charter - TEMPLATE

Project Title			**Date Commenced**	
PROBLEM STATEMENT			**GOAL STATEMENT**	
BUSINESS CASE				
In-scope			**Out-of-Scope**	
CTQ's			**Defect Definition**	
WHO- Process Owner, Champion, Team Leader and Team Members				
Name		**Role/Responsibility**		**Time Commitment**
WHEN- High-level timeframe of the phases				
PHASE	**DATE**	**DATE**	**DATE**	**DATE**
Define				
Measure				
Analyze				
Improve				
Control				



Continuous Improvement – SIPOC Diagram

Purpose and Benefits

A SIPOC Diagram is a powerful tool to show who is providing inputs and receiving outputs from a process. **SIPOC** stands for the five elements mapped in the diagram:

- **S**uppliers
- **I**nputs
- **P**rocess
- **O**utputs
- **C**ustomers/Clients/Constituents.

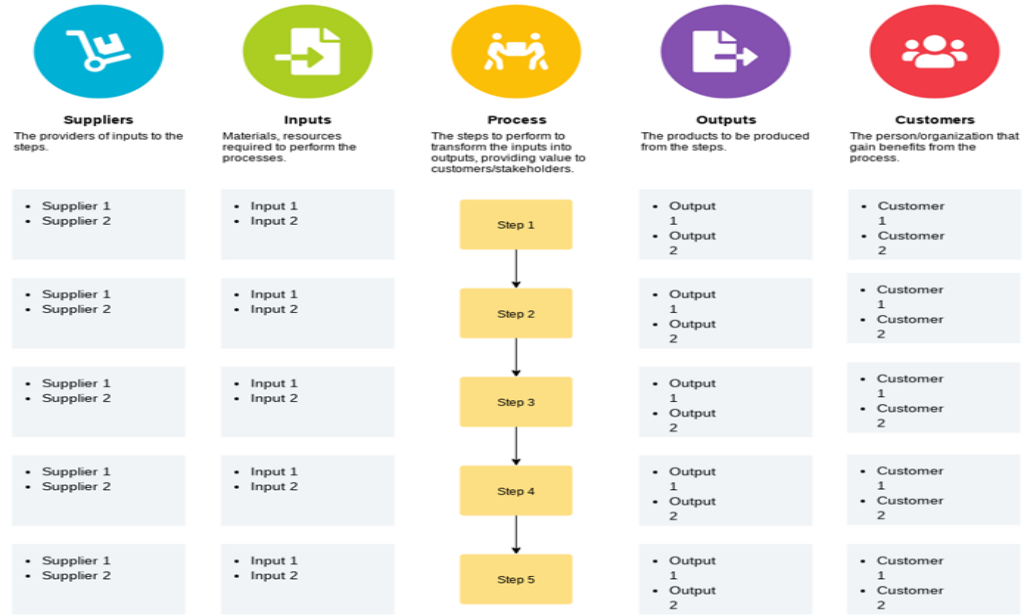
This diagram gives you high level insight into who those suppliers and constituents are that influence and benefit from the process, as well as the inputs needed to make the process run, and the outputs that result.

SIPOC- TEMPLATE

How to use:

- SUPPLIERS- Who supplies inputs to the process?
- INPUT- What're the key inputs needed for expected outputs?
- PROCESS- What are the activities involved for the process to transform inputs to outputs?
- OUTPUT-What're expected outputs of the process?
- CUSTOMERS- Who're the true customers of the process?

SUPPLIERS	INPUT	PROCESS	OUTPUT	CUSTOMERS



Continuous Improvement RACI Matrix (Responsible, Accountable Consulted, Informed)

RACI

Purpose and Benefits - A RACI matrix allows you to clarify role assignments within your project team or within your process mapping.

For each step/activity on the matrix it is indicated who is:

- **R**esponsible for taking action to complete the task
- **A**ccountable for the completion of task
- **C**onsulting resource for the task
- **I**nformed on status of process step/activity

Prior to completing the RACI Matrix for your process, create operational definitions specific to your organization for Responsible, Accountable, Consulted, and Informed.

RACI Matrix- GUIDELINES

How to Use:

- For each task/step put an R, A, C, or an I in the box corresponding to the appropriate stakeholder for that role.
- Every step should have someone in the R and A roles (sometimes it might be the same person/work group)
- When improving a project, try to limit the number of people “Responsible” for a given step/task
- Not every step will necessarily have a C or I role.

ROLE / Project Deliverable (or Activity)	Executive Sponsor	Project Sponsor	Steering Committee	Advisory Committee	Role #5	Project Manager	Tech Lead	Functional Lead	SME	Project Team Member	Developer	Administrative Support	Business Analyst	Role #4	Role #5	Consultant	PMO	Role #3	Role #4
	Project Leadership					Project Team Members					Project Sub-Teams					External Resources			
Initiate Phase Activities																			
Request Review by PMO	A/C	R/A				R/A	A/C		C										
Submit Project Request						R											A		
Research Solution	I					R/A	A/C	A/C	C				C			C			
Develop Business Case	I	A/C	I	I		R/A	C	C	C				C			C	C		
Plan Phase Activities																			
Create Project Charter	C	C				R/A	C	C	C				C			C			
Create Schedule	I	I	I	I		R/A	C	C	C	C	C	C	C			C	I		
Create Additional Plans as Required	I	I	I			R/A				I	I	I	I			C	I		

Specific	Measurable	Attainable	Relevant	Time-Bound
Make sure your goals are focused and identify a tangible outcome. Without the specifics, your goal runs the risk of being too vague to achieve. Being more specific helps you identify what you want to achieve. You should also identify what	You should have some clear definition of success. This will help you to evaluate achievement and also progress. This component often answers how much or how many and highlights how you'll know you achieved	Your goal should be challenging, but still reasonable to achieve. Reflecting on this component can reveal any potential barriers that you may need to overcome to realize success. Outline the steps you're planning to take to achieve your	This is about getting real with yourself and ensuring what you're trying to achieve is worthwhile to you. Determining if this is aligned to your values and if it is a priority focus for you. This helps you answer the why.	Every goal needs a target date, something that motivates you to really apply the focus and discipline necessary to achieve it. This answers when. It's important to set a realistic time frame to achieve your goal to ensure you don't

Continuous Improvement S.M.A.R.T. Goals

Purpose and Benefits:

- S.M.A.R.T. goals can serve as the project objective, marching orders or charge for the project leader and team.
- S.M.A.R.T. goals provide a framework for considerations that need to be evaluated.
- S.M.A.R.T. goals increase the likelihood of success by having a solid understanding of the desired end result before you start working.
- At the completion, any stakeholder should be able to refer back to the project or process improvement objective(s) and determine whether it was successful.

Specific What to accomplish?/Why?	
Measurable How will I measure progress/success?	
Attainable How can it be accomplished?	
Releavant Is it worthwhile?	
Time-bound What is the time Frame	

S.M.A.R.T Goals - TEMPLATE

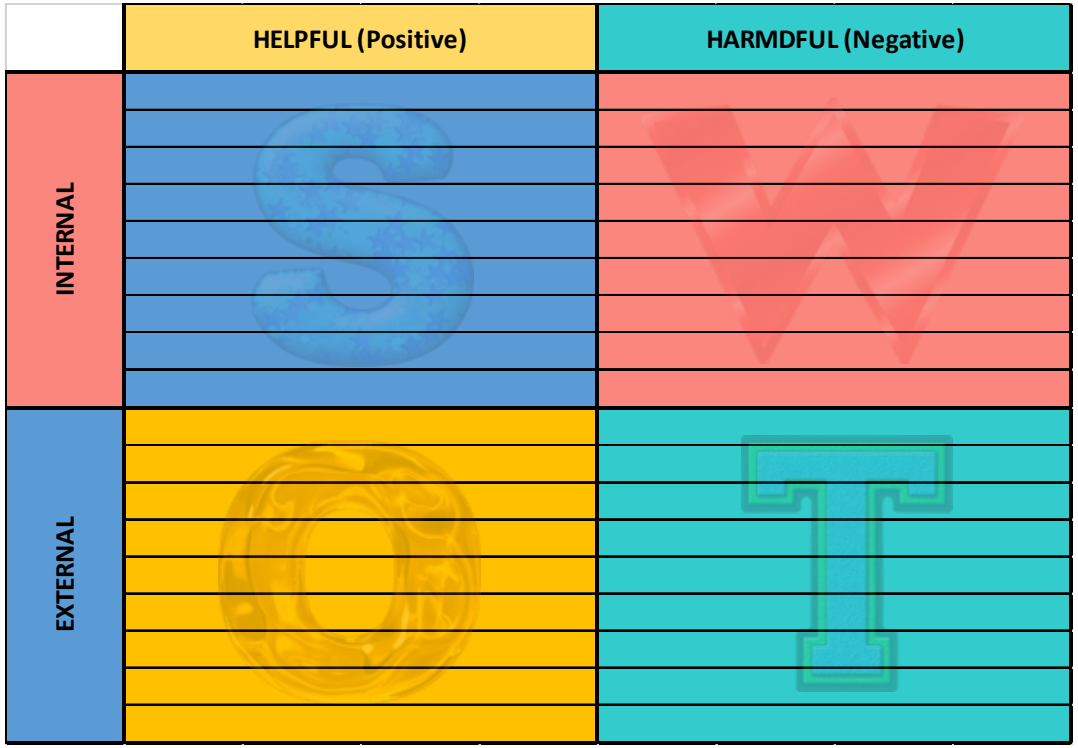
Continuous Improvement S.W.O.T Analysis

Purpose and benefits

- A Strengths, Weaknesses, Opportunities and Threats Analysis allows you and your team to visually layout the good and the bad for your project, process, team, organization, or individuals.

This allows you to:

- better understand your project/process
- address weaknesses
- deter threats
- capitalize on opportunities
- take advantage of strengths
- develop goals and strategies for achieving them,



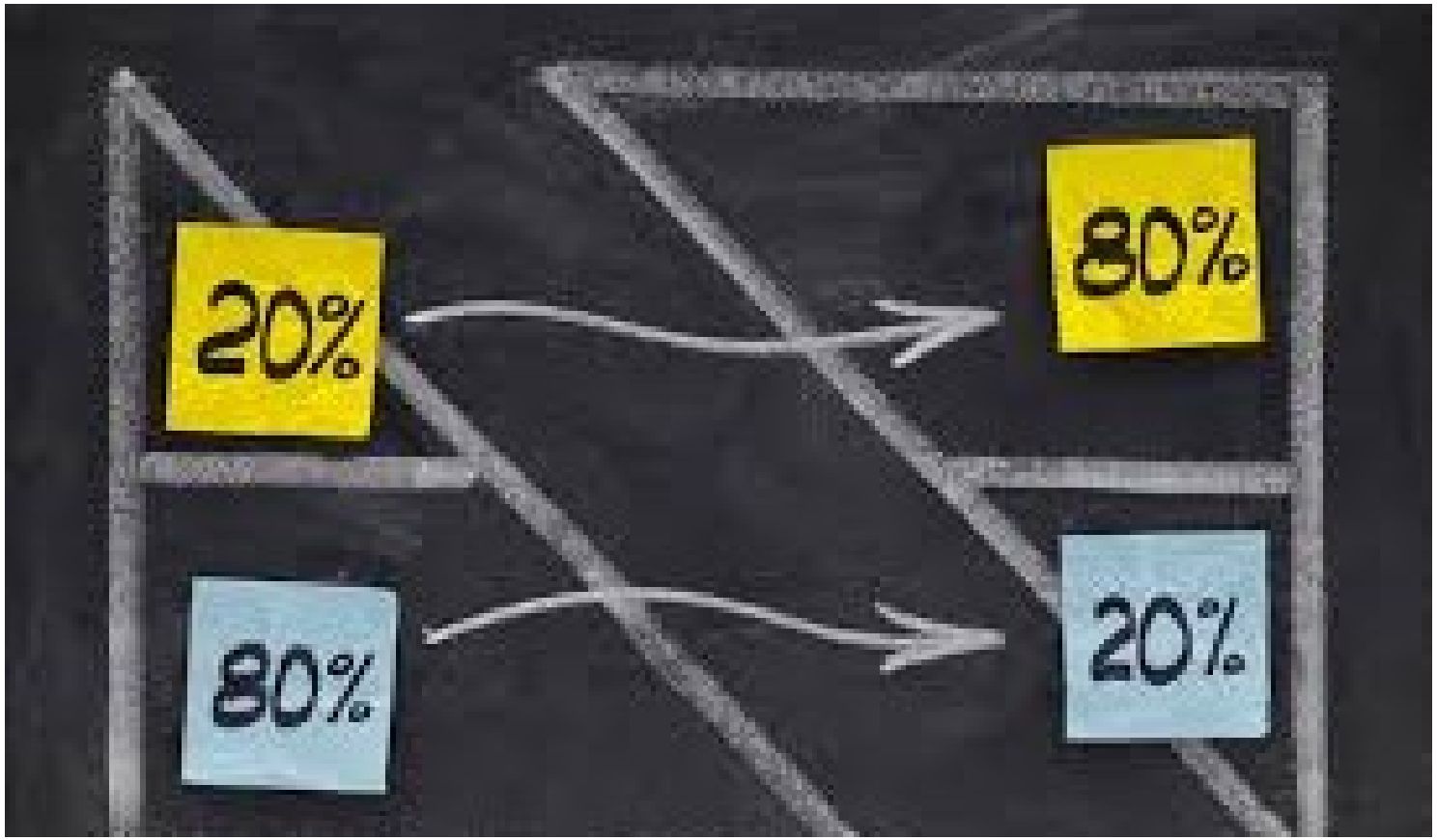
S.W.O.T. Analysis - TEMPLATE

MEASURE

MEASURE - involves more numerical studies and data analysis than the DEFINE phase. This phase focuses on **measurement** system validation and gathering root causes.

MEASURE DELIVERABLES

- Pareto Principle
- Data Collection Summary
- Process Mapping
- CTQ Tree



Continuous Improvement
Pareto Principle

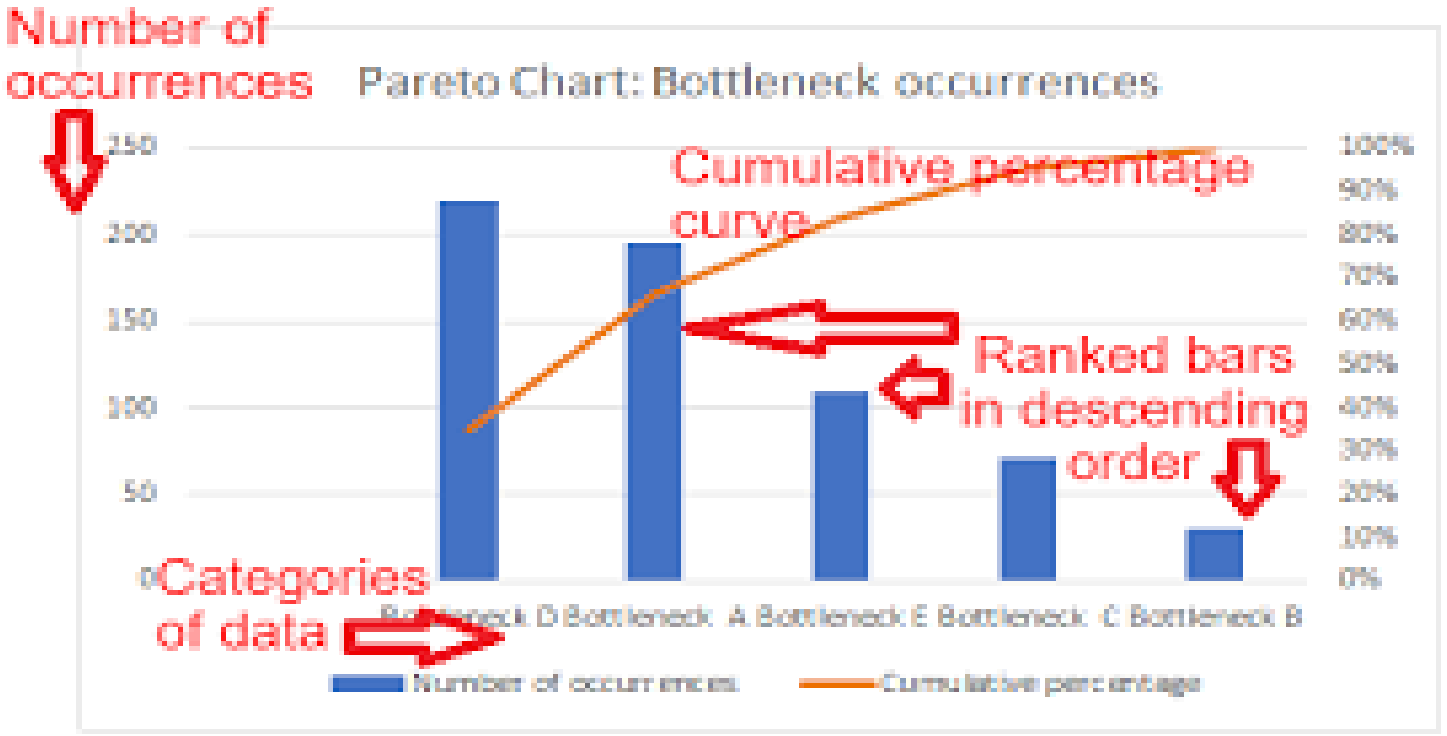
Purpose and Benefits

The Pareto Principle is often referred to as the 80/20 rule--***80% of consequences stem from 20% of causes***. In projects, 80% of the users' needs are met by 20% of a system's features. In software development, 80% of support requests stem from 20% of software bugs. In safety, 80% of injuries stem from 20% of hazards.

This principle is used to:

- Develop project priorities (processes to focus on)
- Draw focus to the greatest number of user-requested needs
- Illustrates the concept of minimum viable product (MVP)

Pareto Principle - GUIDELINES



How to Use:

- **Step 1: Measuring – identify the problems and document them in a table. ...**
- **Step 2: Determine their order of importance. ...**
- **Step 3: Mark or score each recorded problem. ...**
- **Step 4: Group the identified problem and add the marks or scores. ...**
- **Step 5: Time to act**

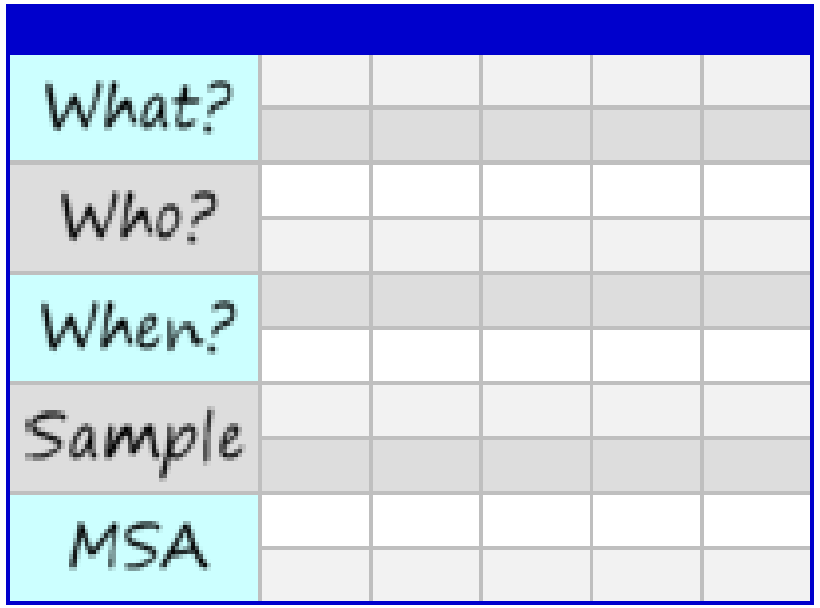
Continuous Improvement- Data Collection Plan

Purpose and Benefit

The Data Collection Plan is created during the Measure phase. It is a detailed document which describes the exact steps as well as the sequence that needs to be followed in gathering the data for the given Six Sigma project.

The steps include:

1. Identify the questions that you want to answer.
2. Determine the kind of data that is available.
3. Determine how much data is needed.
4. Determine how to measure the data.
5. Decide who is going to collect the data.
6. Determine where the data will be collected from.
7. Decide whether to measure a sample or the whole population.
8. Determine in what format the data will be displayed



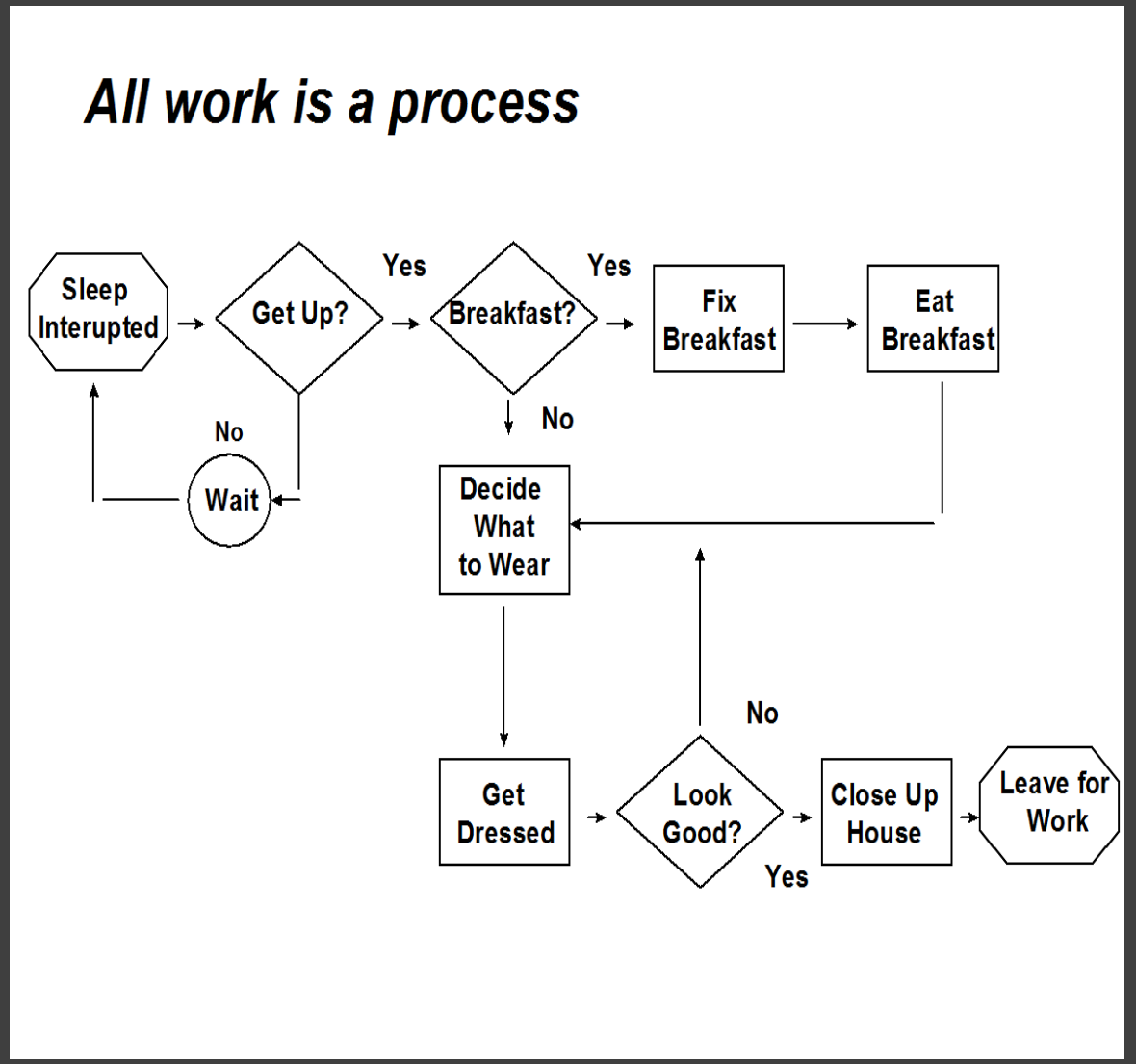
Data Collection Plan - TEMPLATE

DATA COLLECTION PLAN						
Prepared by:					Version/Date:	
For project:						
TYPE OF MEASURE	**WHAT?** What are we measuring?	**WHY?** Why are we measuring this?	**HOW?** How do we collect and record the data?	**WHEN?** When do we collect the data?	**WHERE?** Where in the process?	**WHO?** Who will collect it
Output						
In-process						
Input						

Continuous Improvements- Process Mapping

Purpose and Benefit

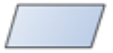
- Process mapping is used to visually demonstrate all the steps and decisions in a particular process. A process map or flowchart describes the flow of materials and information, displays the tasks associated with a process, shows the decisions that need to be made along the chain and shows the essential relationships between the process steps.
- Creating a process map helps organize processes and makes information visible to everyone. By creating a process map or flowchart, you are producing a visual example of the process to better understand it and see areas for improvement.



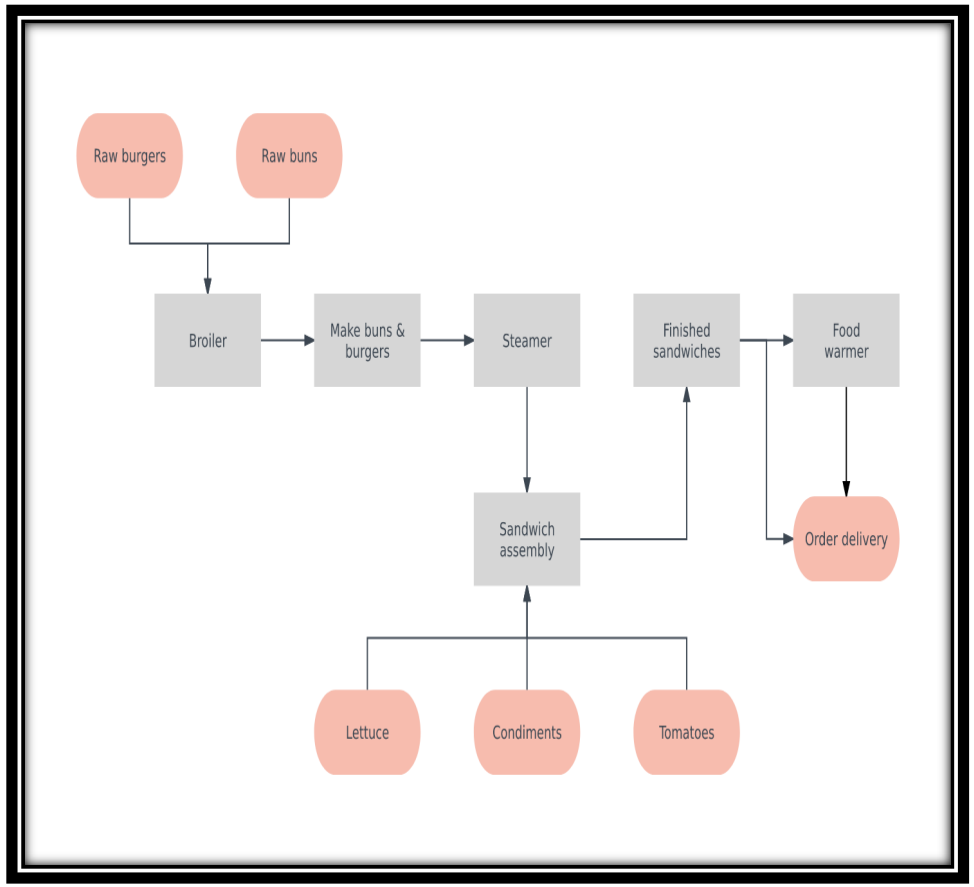
Process Mapping Guidelines

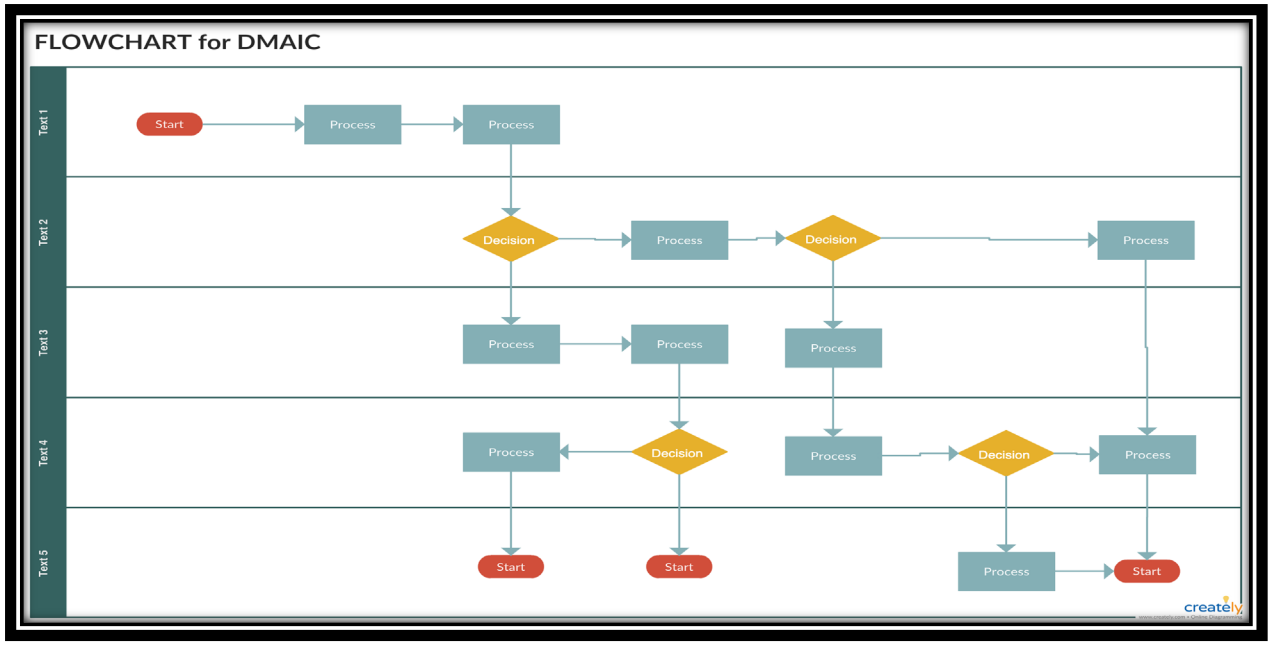
How to Use:

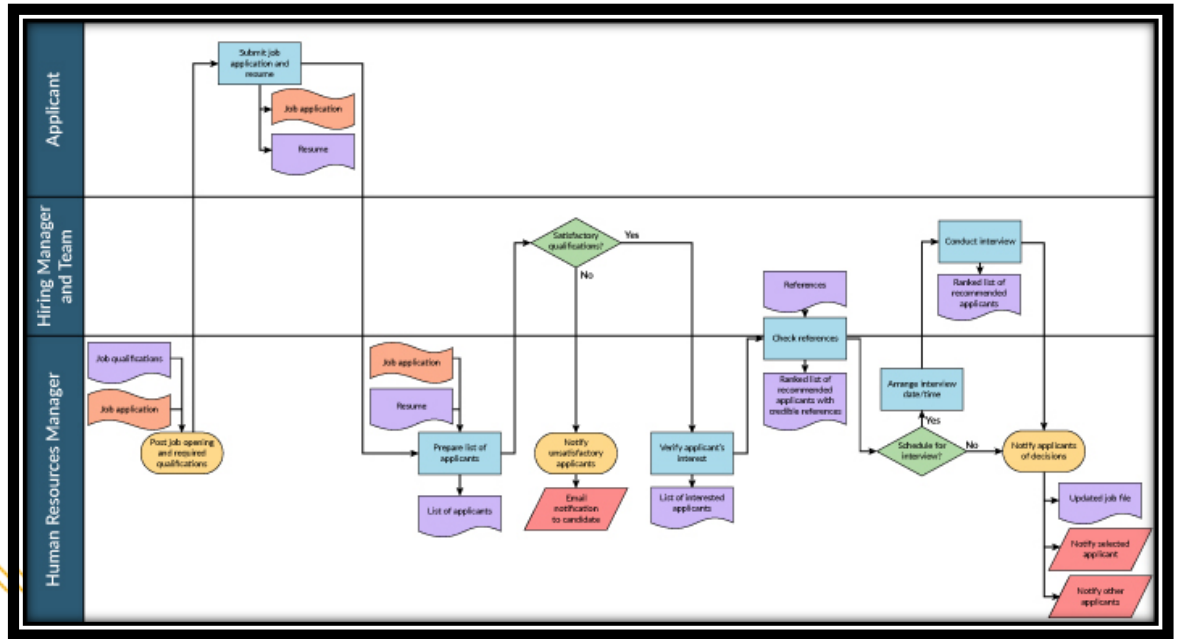
- Step 1: Identify the problem. What is the process that needs to be visualized?
- Step 2: Brainstorm activities involved.
- Step 3: Figure out boundaries.
- Step 4: Determine and sequence the steps.
- Step 5: Draw basic flowchart symbols.
- Step 6: Finalize the process flowchart.

Symbol	Name	What it signifies
	Terminal	Used both where the process starts and ends.
	Activity	Task or activity in the process.
	Decision point	A decision is made. Different process paths and actions are taken as result from different decisions.
	Subprocess	Sub-process steps included within this item.
	Document	A written or electronic document is produced as an output of actions in the process.
	Database	Database of information involved with this step.
	Input / Output	Input or output to a process, such as information or a report.
	Connector	Continue process map on another page when it won't fit on only one. Put a letter (A or B, etc.) inside the circle where you end on one page, and put that same letter in another circle at point the process continues on the next page.

Process Mapping Examples







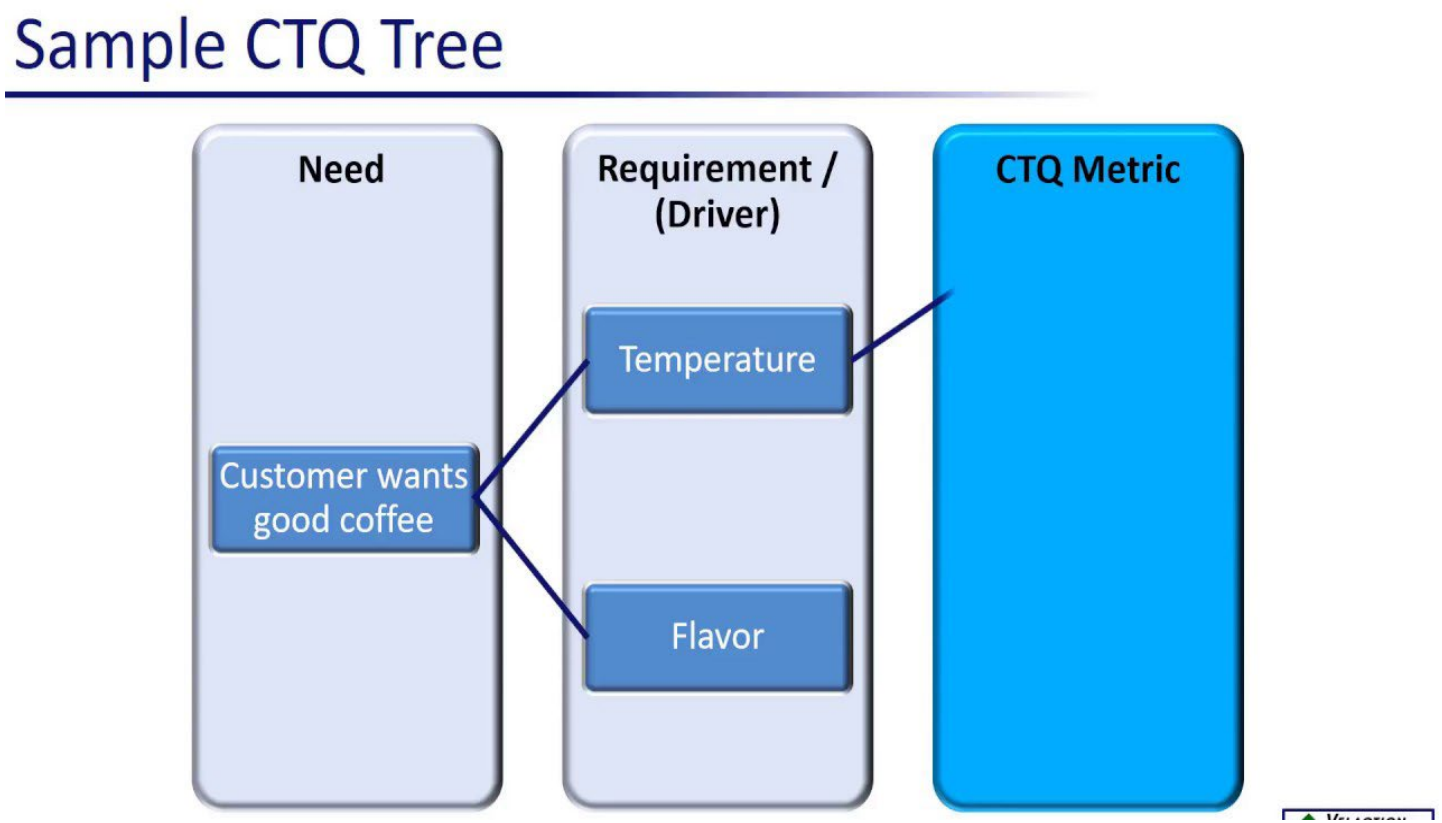
Continuous Improvement CTQ Tree – Critical To Quality

Purpose and Benefits

Critical to Quality (**CTQs)** are the key measurable characteristics of a product or process whose performance standards or specification limits must be met in order to satisfy the customer. These outputs represent the product or service characteristics defined by the customer (internal or external) are parameters that defines the requirements of the customers.

CTQs are very important while developing a product or service. In Six Sigma and other continuous improvement projects too, CTQ plays a critical role as the main purpose of many of these projects is to provide a product or service that satisfies the customers on various parameters.

CTQs characteristic or component that has a direct effect on whether the overall process or product is perceived by the customer to be of acceptable quality. Identification of specific, measurable critical to quality (CTQ) characteristics is essential for meaningful and measurable business process improvement.



Critical to Quality (CTQ) Tree – GUIDELINES

How To Use

- **Need** – This is the starting point for understanding how to delight the client. Needs are what your product or service must deliver to customers to make them happy.

- **Driver** – These are the elements that your customers will use to judge how well your product or service meets their needs. Identifying drivers gives project teams another level of understanding about how to satisfy their customers.

- **Requirement** – These are measurable performance standards that drivers must meet to satisfy the customer. Requirements help project teams measure the quality and performance of the product or service

ANALYZE

ANALYZE - The ANALYZE phase of DMAIC helps project teams identify problems in the production process that cause product defects. The ANALYZE phase provides tools to help spot the problems and determine if these problems are the root causes of defects.

ANALYZE DELIVERABLES

- TIM WOOD
- Fishbone Diagram (Ishikawa)
- Five- Whys
- Root Cause Analysis

Continuous Improvement – T.I.M. W.O.O.D.

Purpose and Benefits

There are seven original wastes (Muda). They are often referred to by the acronym 'TIMWOOD'.

- **T** –Transportation
- **I** – Inventory
- **M**- Motion
- **W** – Waiting
- **O**- Overproduction
- **O**- Over processing
- **D**- Defects

T.I.M. W.O.O.D. Guidelines

PROCESS WASTE

Adds time and/or cost ...
...but does not add value for the customer

T TRANSPORTATION	I INFORMATION, INVENTORY	M MOTION	U UNDERUTILIZATION	W WAITING	O OVERPRODUCTION	O OVERPROCESSING	D DEFECTS
Unnecessary movement of materials, files, and other items relating to the work • Paperwork and hard-copy files going from one office to another • Sending documents or other items to another city or region for processing	"Work in process" beyond what is required to serve the customer • Piles of forms, booklets, other printed items • Rows of jam-packed file cabinets • Long list of in-process requests • Big backlog of inquiries • Backup of emails from customers • Long line of customers (on phone or in person)	Unnecessary movement of people doing the work • Moving from one area or office to another • Cubicle to cubicle • Going to the copier, scanner, fax • Retrieving documents from multiple file boxes • Excess keystrokes	Instances in which available workplace resources are not fully leveraged to produce and deliver service • Underutilized: • Staff skills • Office space • Technology • Data • Institutional knowledge	Delays between one process step ending and the next beginning • Nonproductive time • Waiting for: • Equipment • Delivery • Catchup • Supplier • Mail/shipper • Voice approval • Sign-off • Needed info	Producing outputs beyond what is needed for immediate use • Processing too many • Processing in advance of requests • Throwing away or shelving the extras • Things getting outdated • Attitude of "we have to be ready"	Adding value to a service beyond what customers want or will pay for • Double-checking, inspecting • Bells and whistles • Better than good enough • Trying to "delight" the customer when "satisfying" is enough • Reports that nobody reads	Any aspect of the service that compromises quality in the eyes of the customer • Processing errors • Inaccuracies • Incorrect forms, materials • Missing information • Broken links • Difficult to read • Forms, instructions difficult to understand • Wasted materials

Continuous Improvement – Fishbone Diagram (Ishikawa)

Purpose and Benefits

A **Fishbone Diagram** is often used to identify and organize the potential causes of a business problem in an easy and understandable format. It is used to identify the sources of **process** variation which caused the problem to occur. It is called this way because of its shape that looks like a **fishbone**. **Also called Ishikawa**.

Let **PEMME** *guide you!*

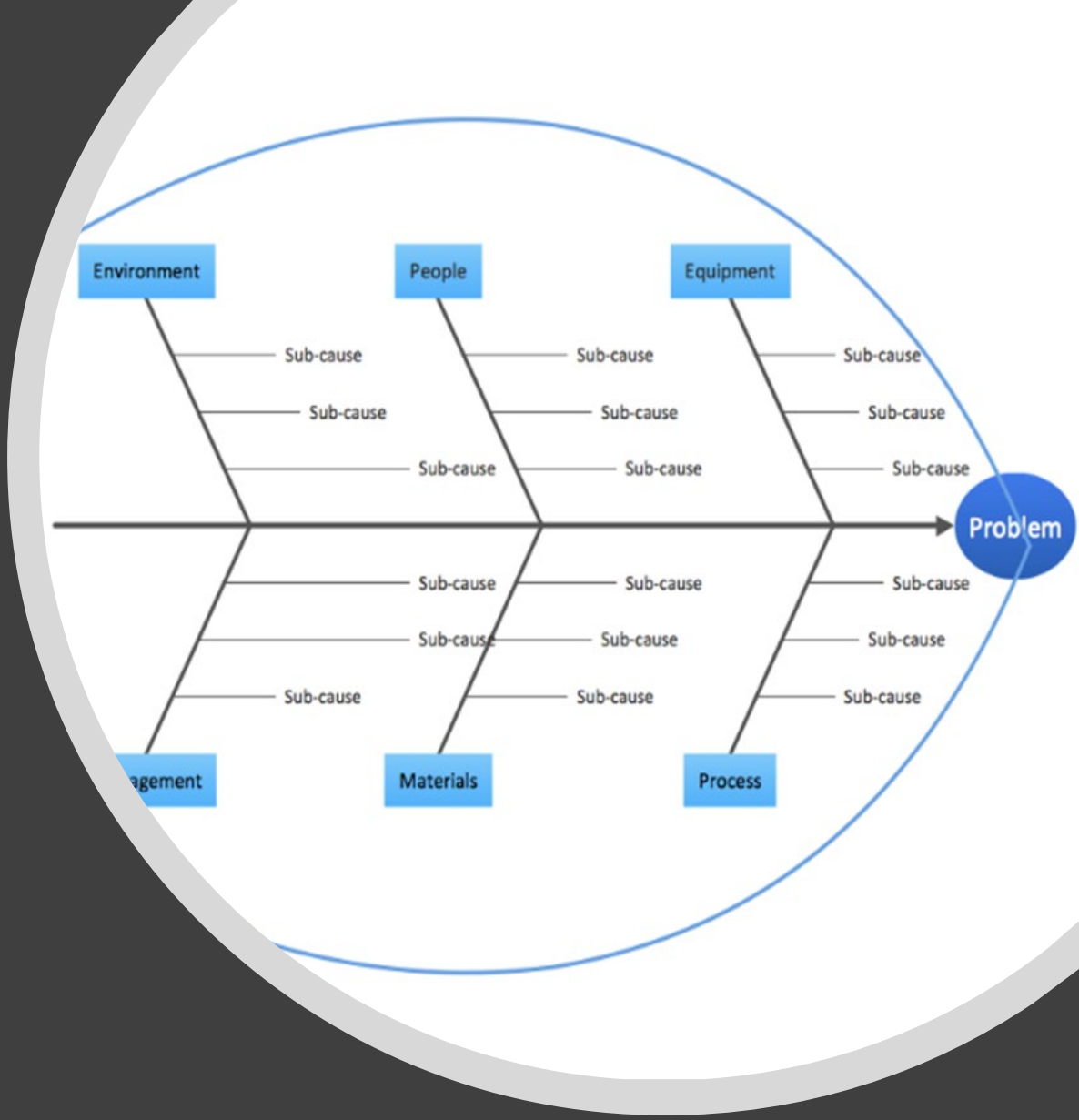
P- People

E- Equipment

M – Methods

M – Materials

E- Environment

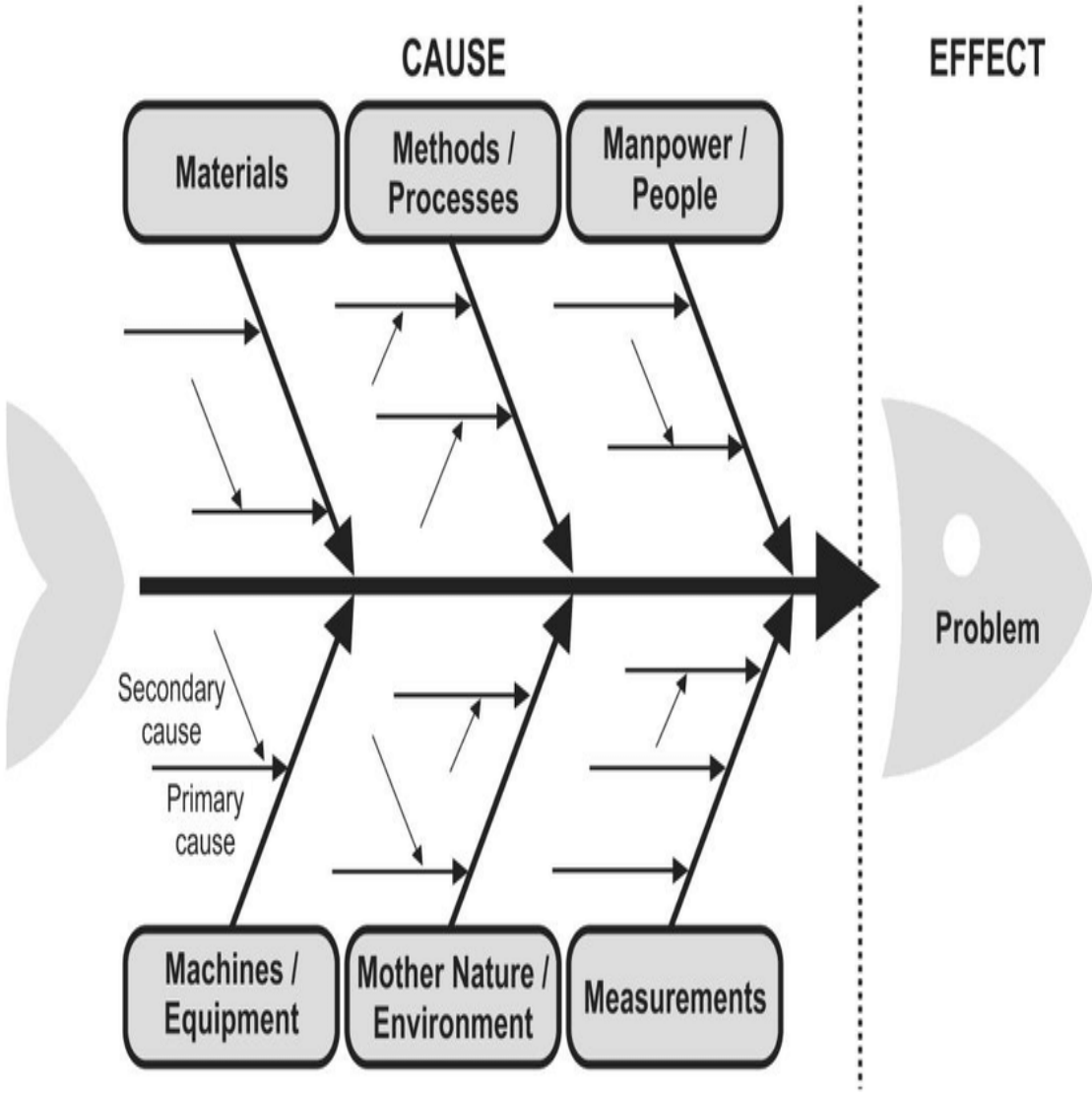


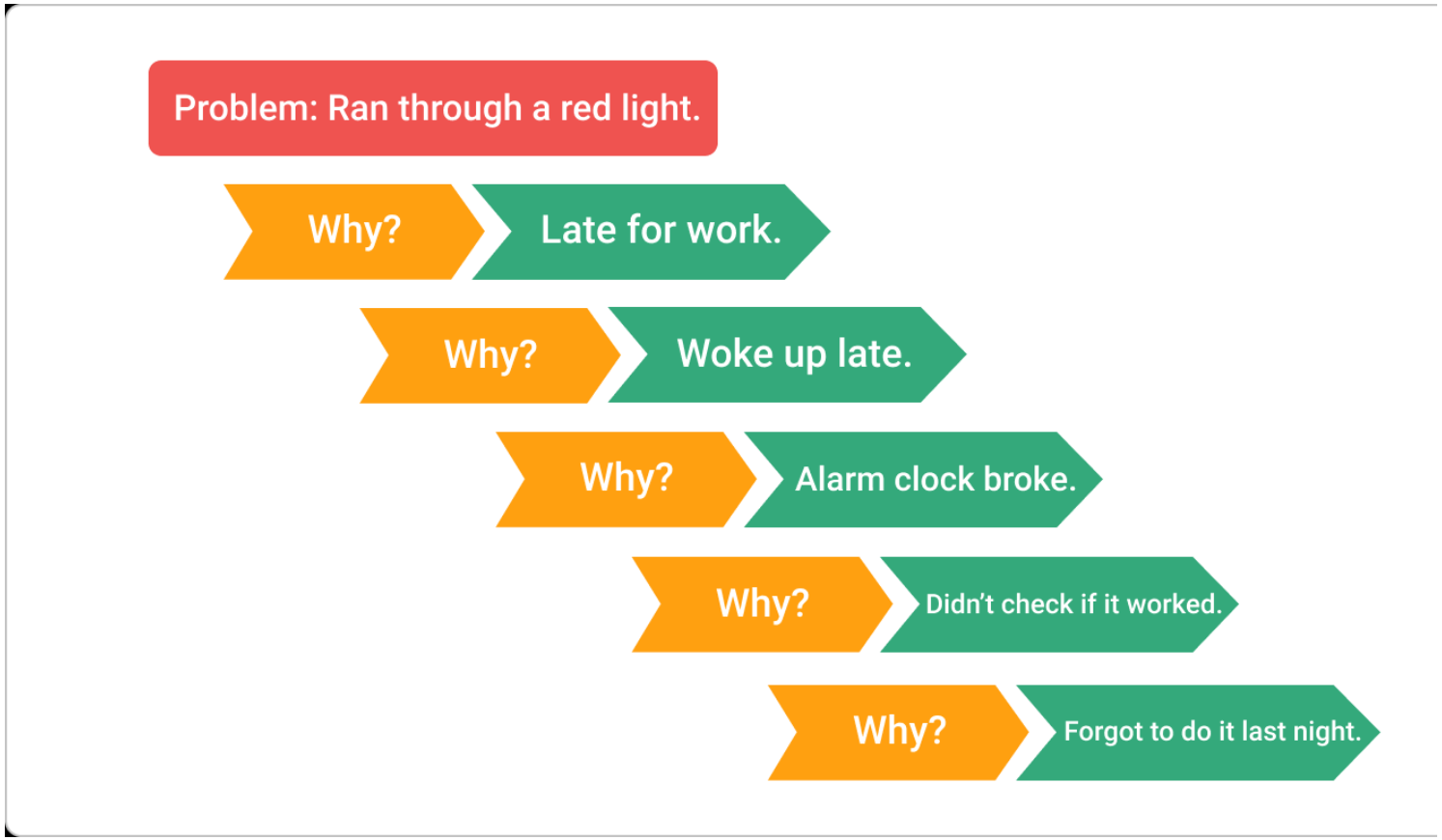
Fishbone Diagram- GUIDELINES

How-to-Use

Fishbone Diagram demonstrates Cause and Effects.

1. Agree on the problem statement (also referred to as the effect). This is written at the mouth of the “fish.”
2. Agree on the major categories of causes of the problem (written as branches from the main arrow). Major categories often include: equipment or supply factors, environmental factors, rules/policy/procedure factors, and people/staff factors.
3. Brainstorm all the possible causes of the problem. Ask “Why does this happen?” As each idea is given as a branch from the appropriate category (places it on the fishbone diagram). Causes can be written in several places if they relate to several categories.
4. Again asks “Why does this happen?” about each cause. Write sub-causes branching off the cause branches.
5. Continues to ask “Why?” and generate deeper levels of causes and continue organizing them under related causes or categories.





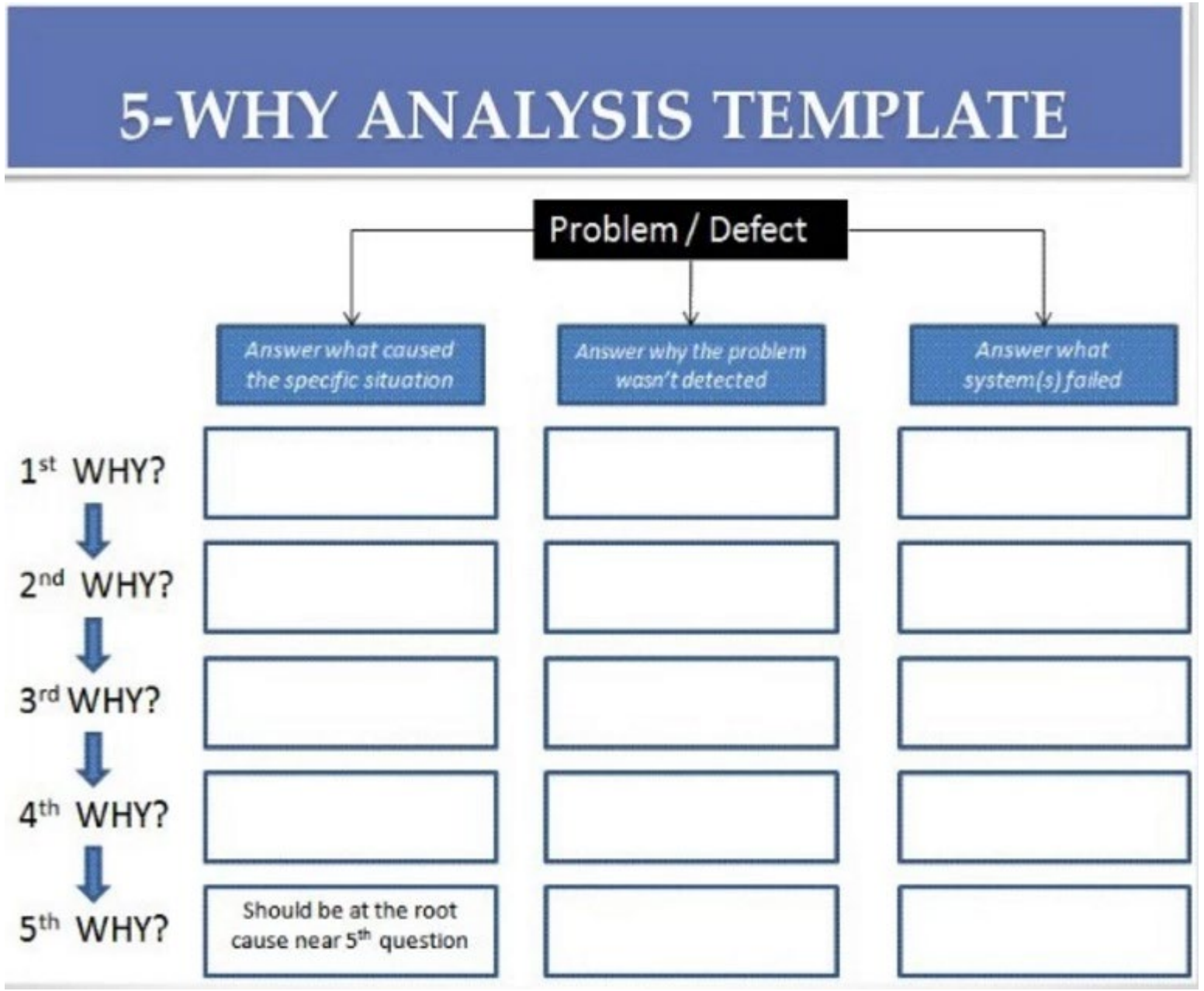
Continuous Improvement – 5 Why

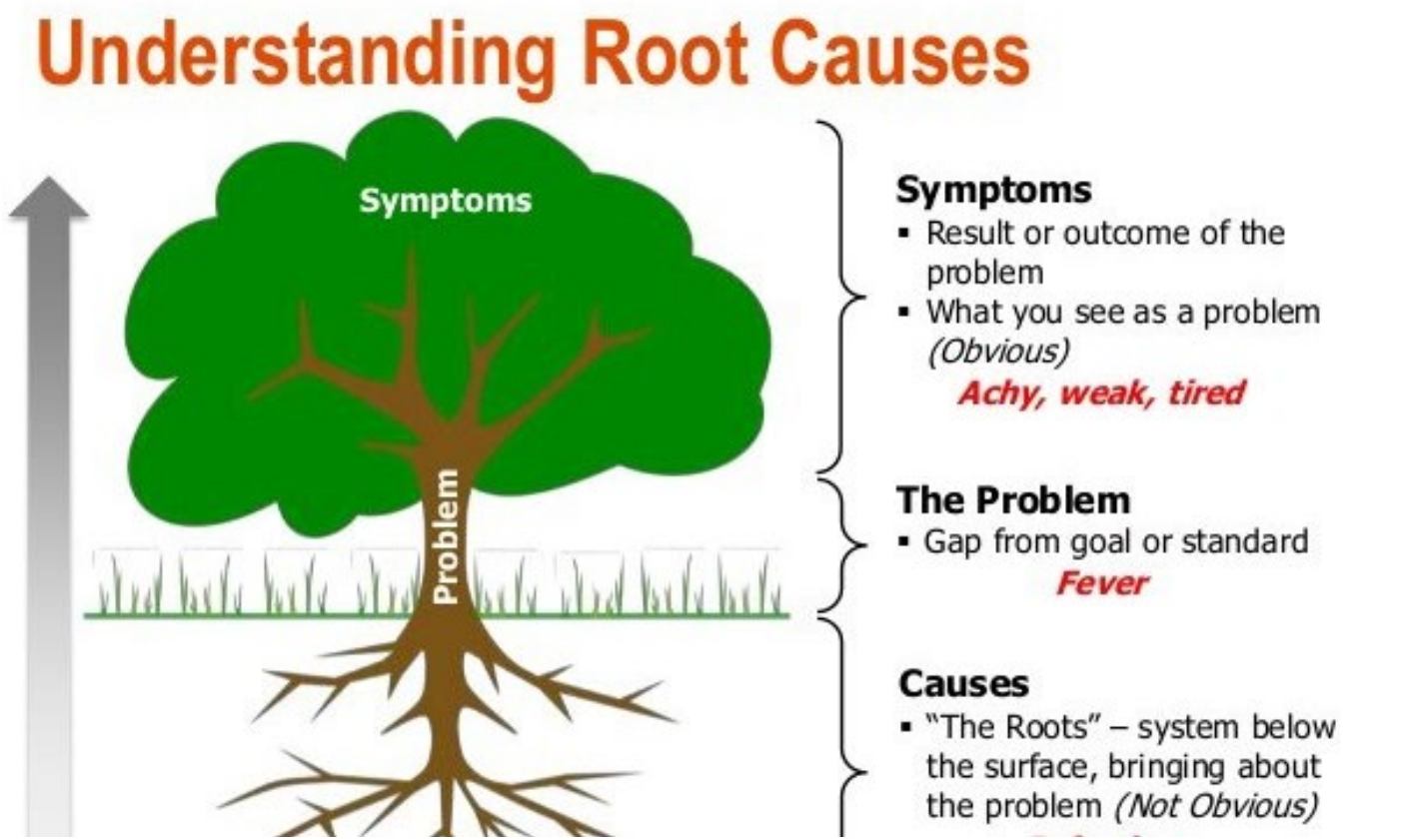
Purpose and Benefits

The 5 Whys is a basic root cause analysis technique used in the Analyze phase. To solve a problem, we need to identify the root cause and then eliminating it. Therefore, main goal of the is to drill down to the bottom of problem to find out problem of occurrence or root cause and thereby preventing its recurrence. The benefits include:

- Helping identify the root cause of a problem.
- Determining the relationship between different root causes of a problem.
- It is one of the simplest tools; easy to complete without statistical analysis.

5 WHY TEMPLATE



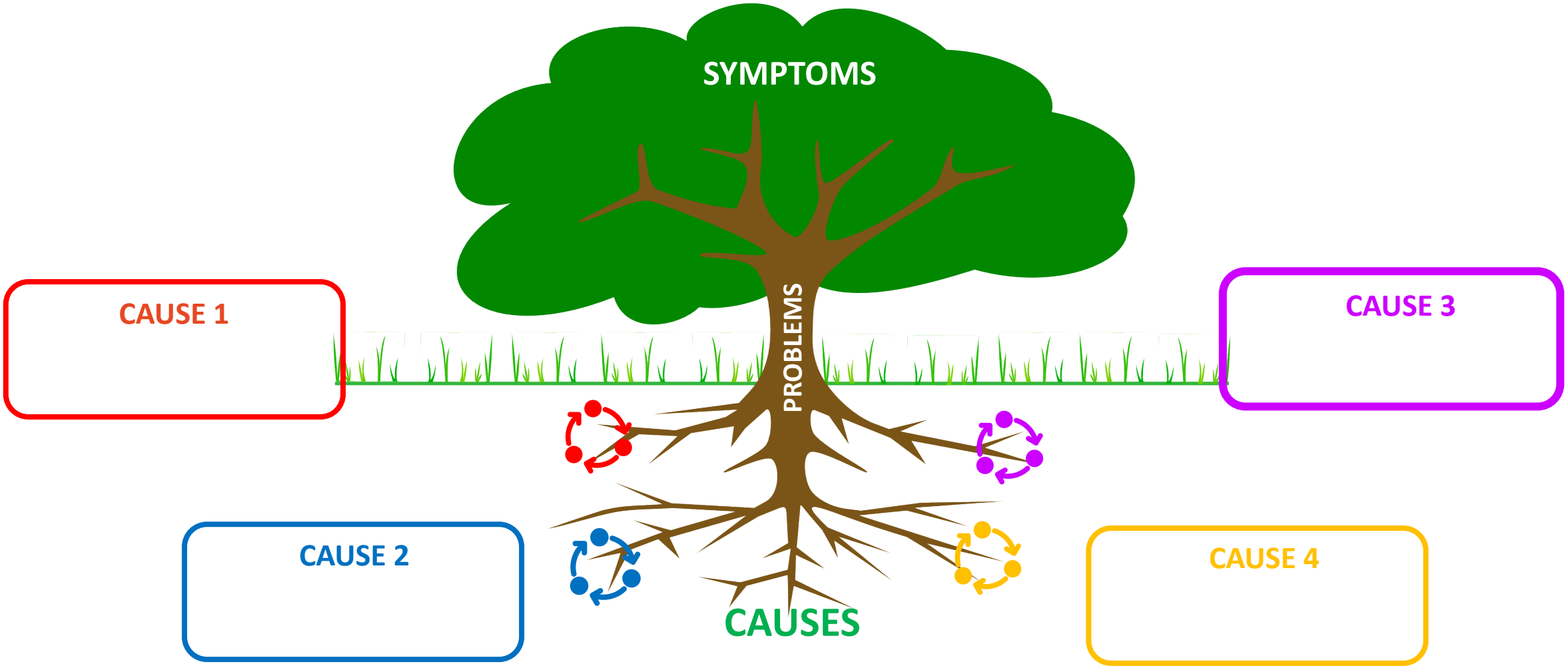


Continuous Improvement- Root Cause Analysis (RCA)

Purpose and Benefits

Root cause analysis (RCA) is a systematic process for identifying "**root causes**" of problems or events and an approach for responding to them. Root Cause Analysis leads to the underlying source of the defect/fault/problem, so the team can design solutions and change the process to permanently eliminate it.

Root Cause Analysis (RCA) - TEMPLATE



IMPROVE

IMPROVE – The IMPROVE phase of DMAIC determines a solution which is based on the uncovered problem in the first three phases. The IMPROVE Phase consists of generating a potential solution, validating the pilot solution, mitigating risk and developing a roll out plan for implementation

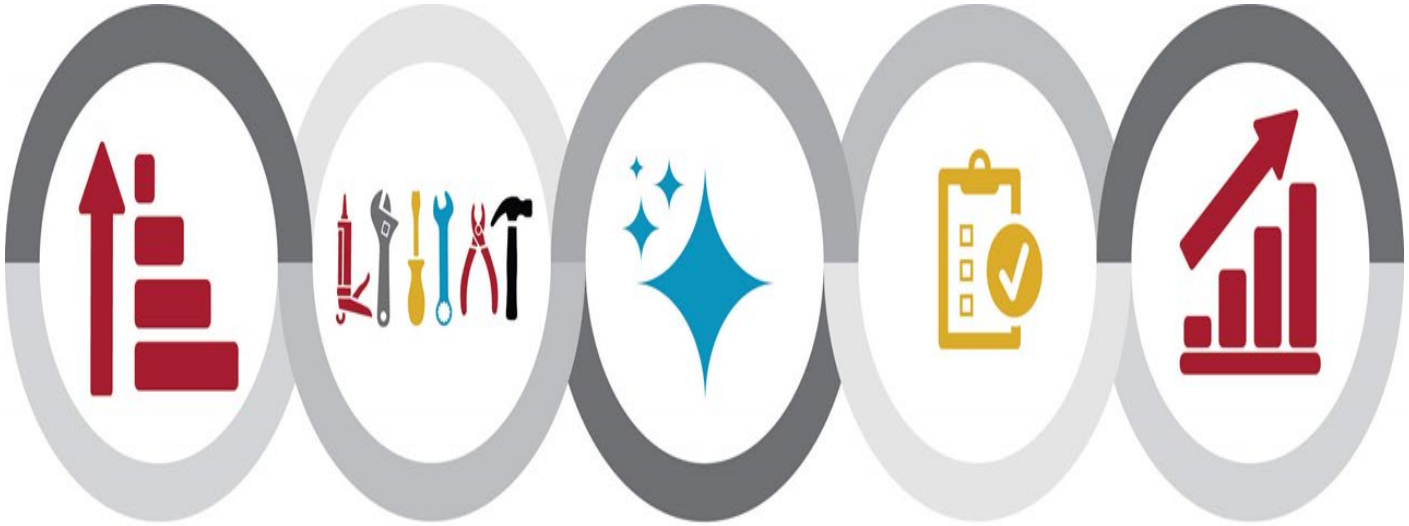
IMPROVE **DELIVERABLES**

- 5 S's
- Plan, Do, Check, Act (PDCA)
- Error Proofing

Continuous Improvement – 5 S's

Purpose and Benefits

- 5S is a system for organizing spaces so work can be performed efficiently, effectively, and safely. This system focuses on putting everything where it belongs and keeping the workplace clean, which makes it easier for people to do their jobs without wasting time or risking injury.



SORT
Distinguish needed items from unneeded items and eliminate the latter.

STRAIGHTEN
Keep needed items in the correct place to allow for easy and immediate retrieval.

SHINE
Keep the workplace neat and clean. Inspect through cleaning.

STANDARDIZE
Make up the rules, follow and enforce them. Make a part of the regular work routine.

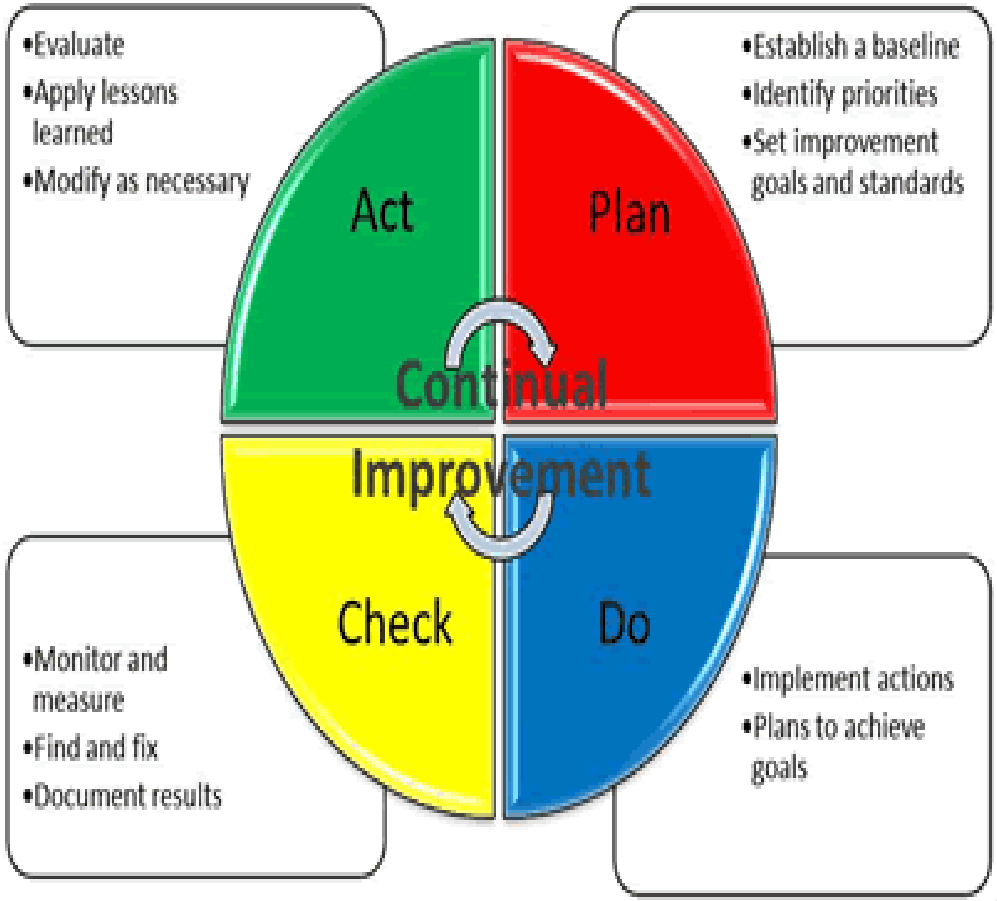
SUSTAIN
Review new standards. Maintain established procedures.

5S - GUIDELINES

Continuous Improvement – PDCA (Plan, Do, Check, Act)

Purpose and Benefits

PDCA is an iterative four-step management method used in business for the control and continuous improvement of processes and products. Plan, Do, Check, Act allows organizations to make improvements in business processes and methods while continually evaluating the results to ensure that the organization takes steps to improve efficiency.



PDCA - GUIDELINES

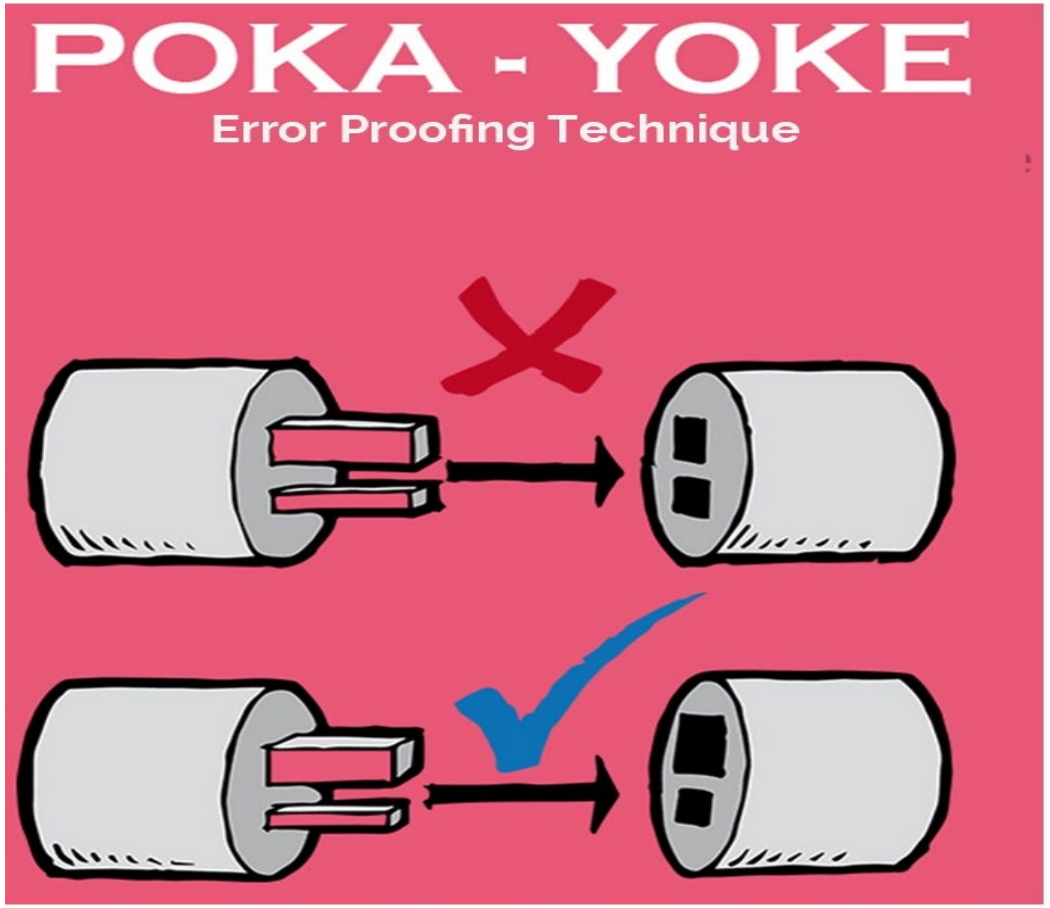
The Plan-Do-Check-Act Procedure

- **Plan:** Recognize an opportunity and plan a change.
- **Do:** Test the change. Carry out a small-scale study.
- **Check:** Review the test, analyze the results, and identify what you've learned.
- **Act:** Take action based on what you learned in the study step. If the change did not work, go through the cycle again with a different plan. If you were successful, incorporate what you learned from the test into wider changes. Use what you learned to plan new improvements, beginning the cycle again.

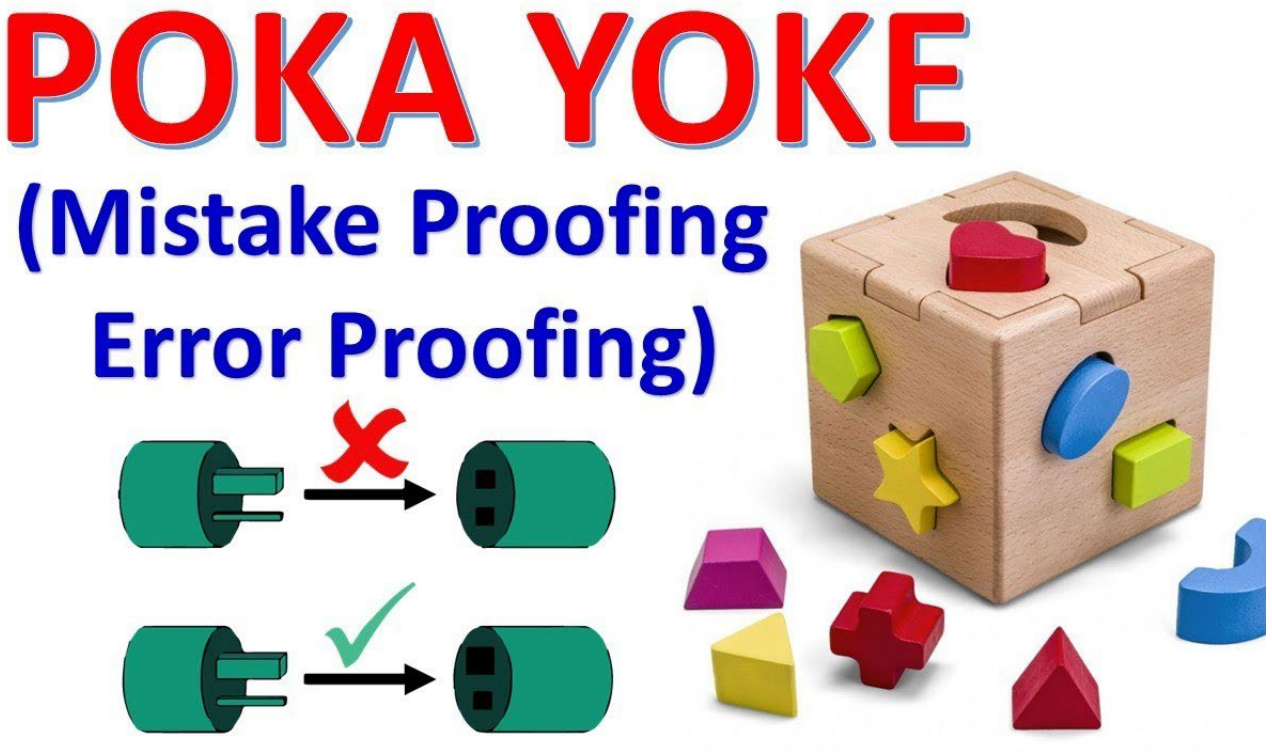
Continuous Improvement – Error Proofing

Purpose and Benefits

- **Error**-**proofing** refers to the implementation of fail-safe mechanisms to prevent a process from producing defects. This activity is also know by the Japanese term poka-yoke. Poka-yoke/Error Proofing is any mechanism or device in a process that helps eliminate defects by preventing, correcting, or drawing attention to human error as they occur.



Error Proofing - GUIDELINES



- Obtain or create a flowchart of the process. Review each step, thinking about where the errors are likely to occur.
- For each potential error, work back through the process to find its source.
- For each error, think of potential ways to make it impossible for the error to occur. Consider:
    - Elimination: eliminating the step that causes the error.
    - Replacement: replacing the step with an error-proof one.
    - Facilitation: making the correct action far easier than the error.
- If you cannot make it impossible for the error to occur, think of ways to detect the error and minimize its effects.
- Choose the best mistake-proofing method or device for each error. Test it, then implement it.

CONTROL

CONTROL – The **CONTROL phase** is the conclusion of the team's journey. The focus of this stage is to make sure that the action item created in the **Improve Phase** is well-implemented and maintained. Several tools are used in this stage to make sure that variables are within its limits. This is the handoff phase to the Process Owner to maintain the gains.

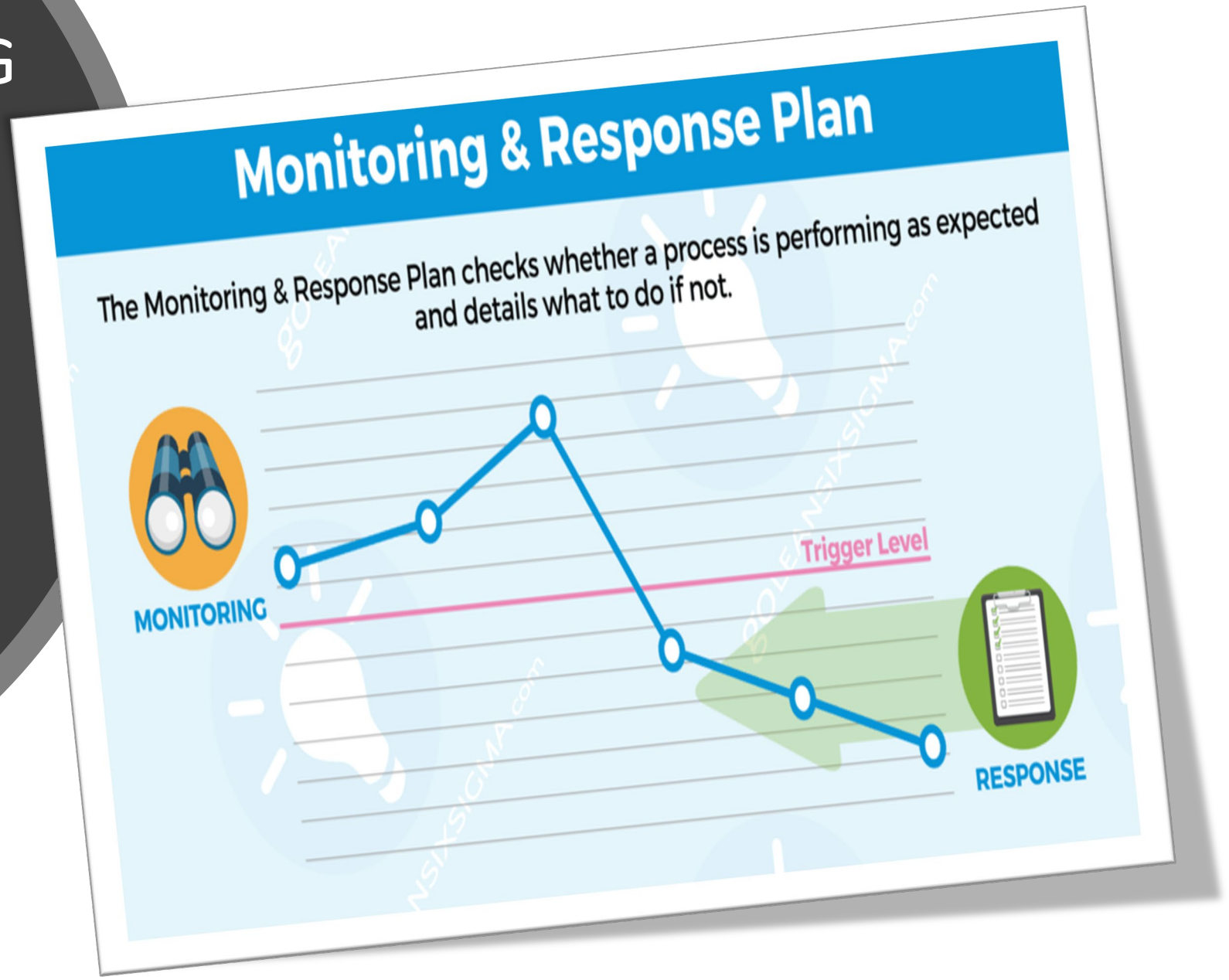
IMPROVE DELIVERABLE

- Process Monitoring Plan
- Control Chart
- **PFMEA** (Process Failure Modes and Effects Analysis)

PROCESS MONITORING PLAN

Purpose and Benefits

- **Process Monitoring Plan** is used while observing a **process** a **monitoring plan** helps define: Key **process** and output measures for ongoing measurement of the improved **process**. When data is to be collected and at how often. Define the method for gathering, recording, and reporting data on the measures



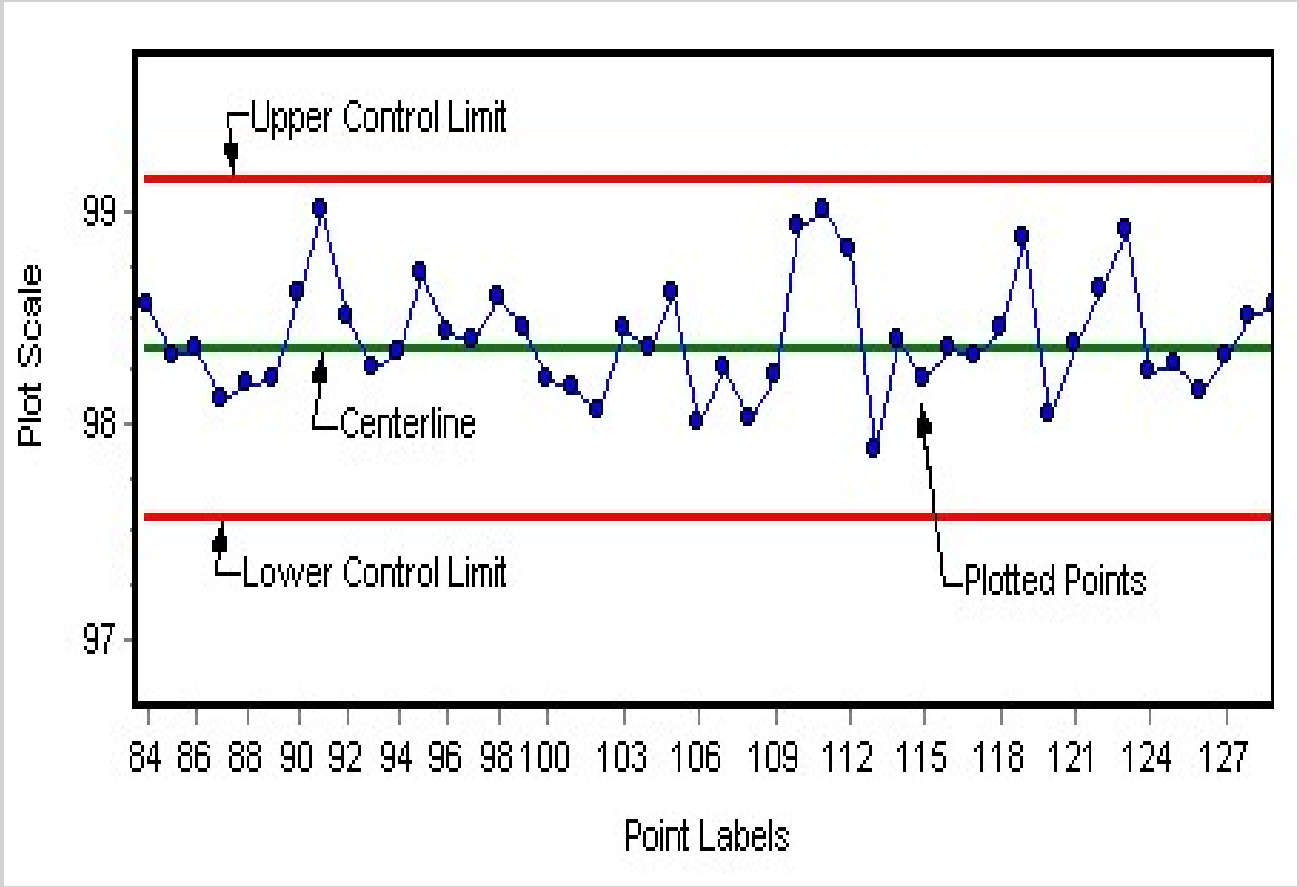
PROCESS MONITORING PLAN TEMPLATE

Name of the Measure	Input, Process or Output?	What is the Target?	Method of Data Capture	Checking Frequency	Person Responsible	Upper/Lower Trigger Point	Who Will Respond?	Reaction Plan
O1: Order Lead Time	*O*	*less than 16 minutes for cold food; Less than 20 minutes for hot food*	*Time stamp, in and out*	*Daily*	*Server*	*Over 18 minutes for cold food; Over 22 minutes for hot food*	*Manager*	*Observe the process to see why it's taking longer. Make the corrections. Are the orders still being processed in FIFO order? Are Servers turning orders into the kitchen immediately after taking them? Are we stocked at point of use through peak hours?*

CONTROL CHART

Purpose and Benefits

- **The Control Chart -** is a graph used to study how a process changes over time. Data are plotted in time order.
  A **control chart** always has a central line for the average, an upper line for the upper **control** limit, and a lower line for the lower **control** limit



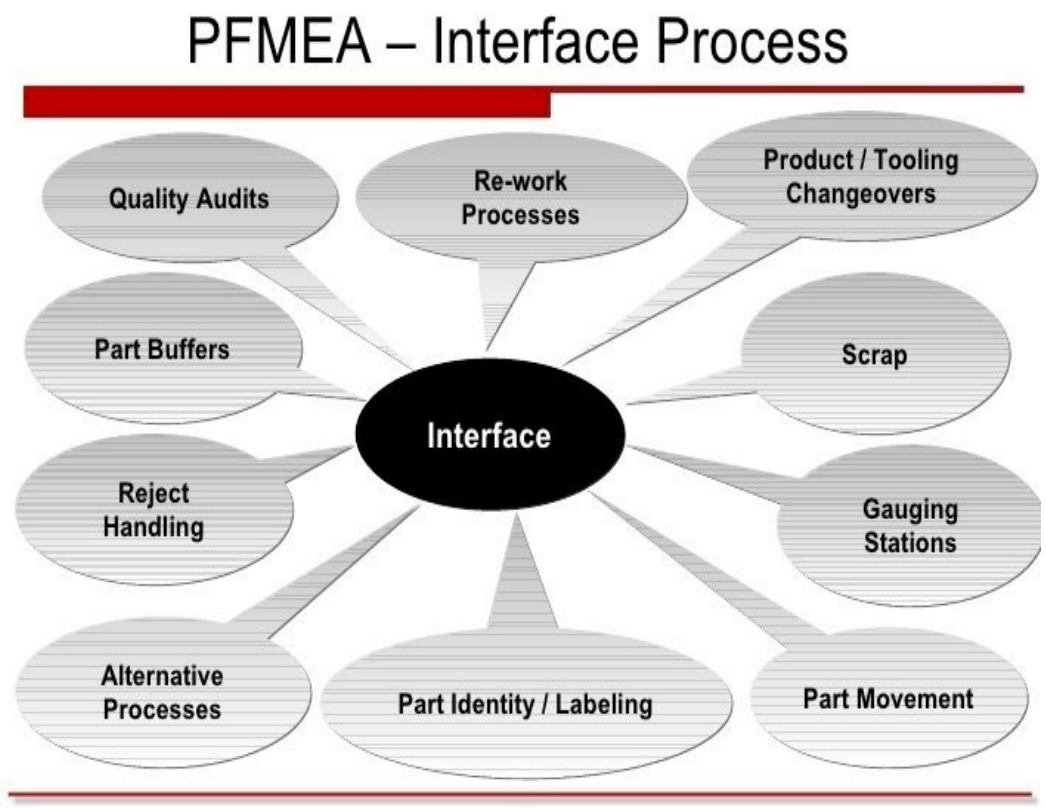
The general step-by-step approach for the implementation of a control chart is as follows:

- Define what needs to be controlled or monitored.
- Determine the measurement system that will supply the data.
- Establish the **control charts**.
- Properly collect data.
- **Make** appropriate decisions based on **control chart** information.

Situation	Statistical Test
Continuous data, one figure at a time For example: A team is tracking the length of time, measured in days, it takes to process claims. They are randomly selecting one completed claim each day and plotting the time it took to complete that one claim.	**Individuals and Moving Range** **I & MR Chart**
Continuous data, averages with small sub-group sizes For example: A team is tracking cycle time, measured in days, for claims processing. They are randomly selecting five completed claims each day and plotting the average cycle time.	**Average and Range** **X bar & R Chart**
Continuous data, averages with large sub-group sizes For example: A process owner is monitoring call length, measured in minutes and seconds. Each day, the average length for all calls received is plotted. The call center receives over 100 calls per day.	**Average and Standard Deviation** **X bar & S Chart**

CONTROL CHART GUIDELINES

PFMEA (Process Failure Modes and Effects Analysis)



Purpose and Benefits

- **PFMEA (Process Failure Modes and Effects Analysis)** is a methodical approach used for identifying risks on process changes. The Process FMEA initially identifies process functions, failure modes their effects on the process. If there are design inputs, or special characteristics, the effect on end user is also included. The severity ranking or danger of the effect is determined for each effect of failure.

FMEA Form

Process/Product Name: _____ Prepared By: _____

Responsible: _____ FMEA Date (Orig.): _____ (Rev.): _____

Process Step/Input	Potential Failure Mode	Potential Failure Effects	SEVERITY (1 - 10)	Potential Causes	OCCURRENCE (1 - 10)	Current Controls	DETECTION (1 - 10)	RPN	Action Recommended	Resp.	Actions Taken	SEVERITY (1 - 10)	OCCURRENCE (1 - 10)	DETECTION (1 - 10)	RPN
What is the process step, change or feature under investigation?	In what ways could the step, change or feature go wrong?	What is the impact on the customer if this failure is not prevented or corrected?		What causes the step, change or feature to go wrong? (how could it occur?)		What controls exist that either prevent or detect the failure?			What are the recommended actions for reducing the occurrence of the cause or improving detection?	Who is responsible for making sure the actions are completed?	What actions were completed (and when) with respect to the RPN?				
Fill carafe with water	*Wrong amount of water*	*Coffee to strong or weak*	*8*	*Faded level marks on carafe*	*4*	*Visual Inspection*	*4*	*128*	*Replace old carafes*	*Mel*	*Carafe replaced 9/15*	*8*	*1*	*3*	*24*
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PFMEA (Process Failure Modes and Effects Analysis) - TEMPLATE

NEXT STEPS

To improve a business process, follow these steps.

- Map **processes**.
- Analyze the **process**.
- Redesign the **process**.
- Acquire resources
- Implement and communicate change.
- Review the **process**