

**PathStone Group**



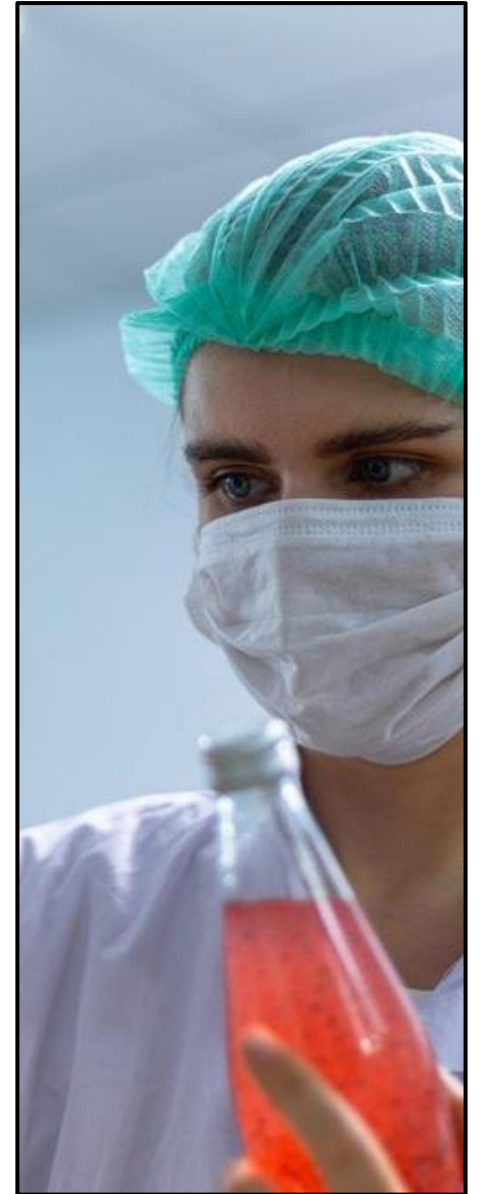
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# Cause and Effect Diagram

# Agenda

1. Cause and Effect: What is it ?
2. Cause and Effect purpose and benefits
3. Diagram Creation
4. Analysis
5. Limitations
6. Takeaways

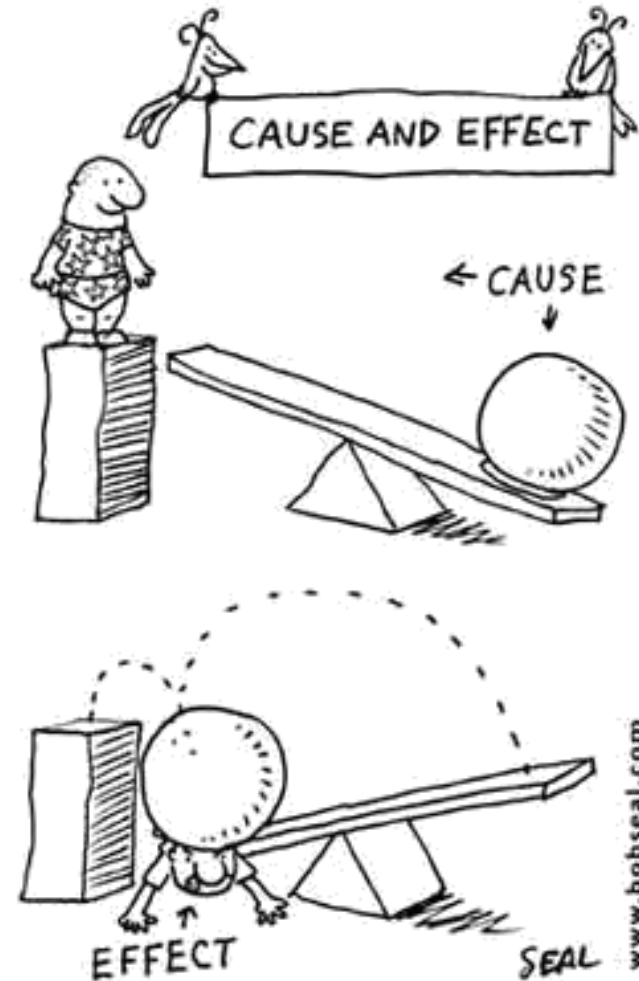


# Introduction

## What is it ?

A cause-and-effect diagram **examines why something happened or might happen** by organizing **potential causes** into **smaller categories**.

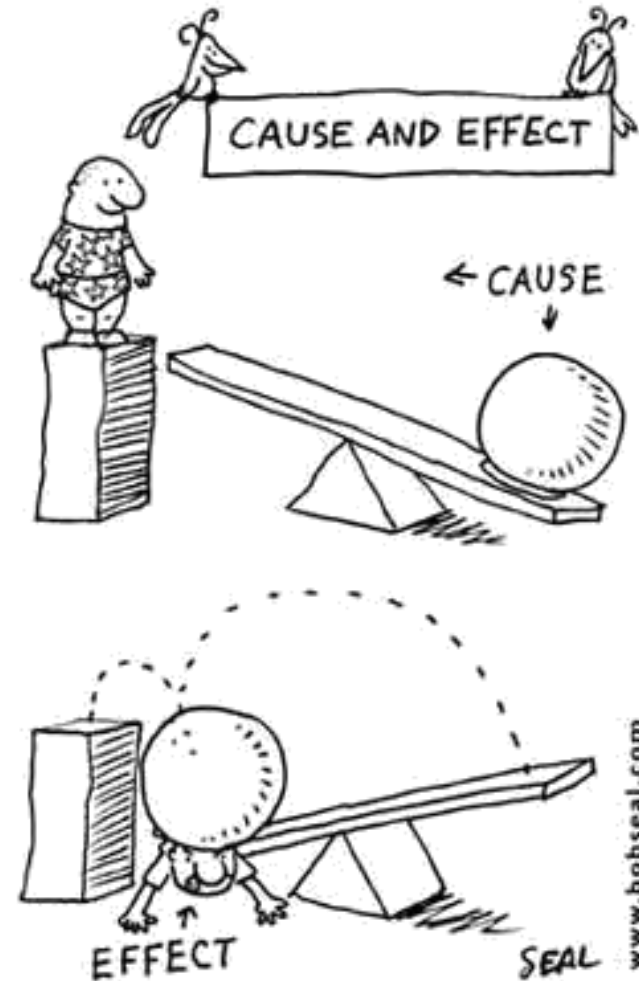
It can also be useful for showing relationships between contributing factors.



# Introduction

## Purpose and Benefits

- Being a visual tool, it is **easy** to understand and analyze.
- It helps us to **identify** the root cause of the problem.
- It helps us to locate **bottlenecks** in the process.
- It helps us to **improve** the process.
- It involves an **in-depth** discussion of the problem, which educates the team.
- It **prioritizes** further analysis and helps us to take corrective action.



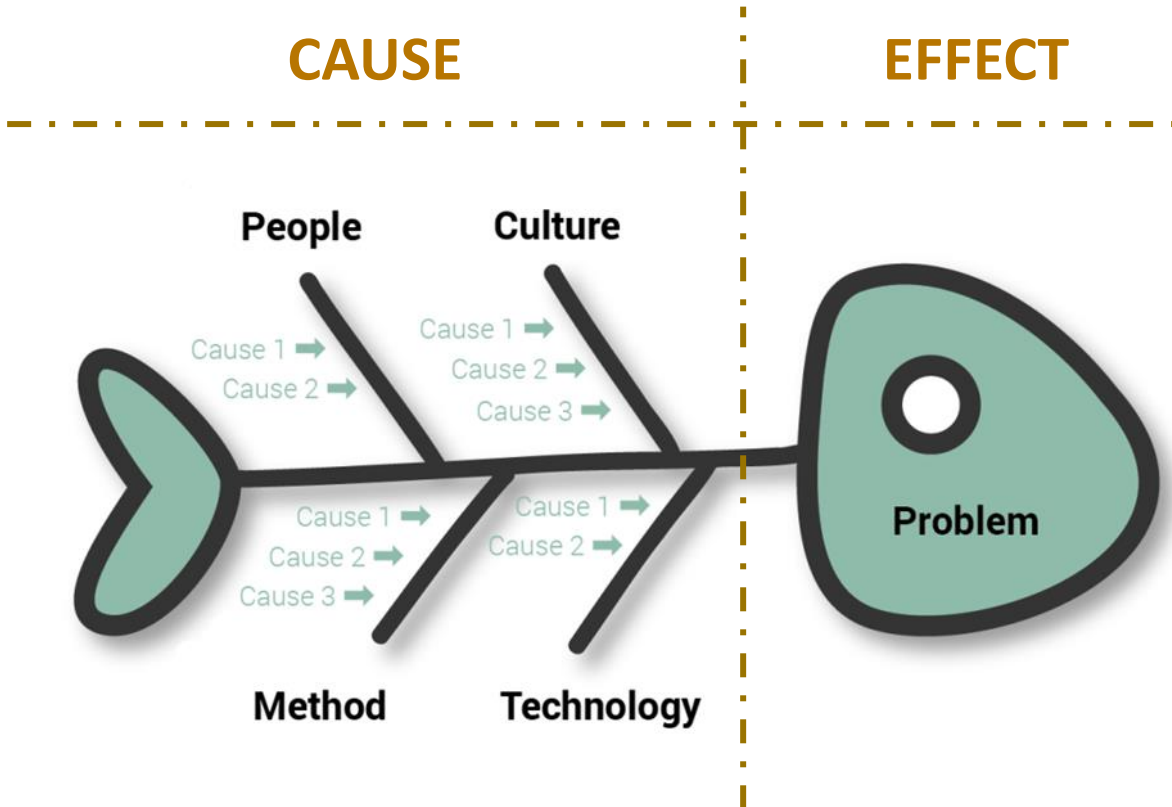
# Cause and Effect

## Diagram Creation



# Cause and Effect

## Diagram Creation

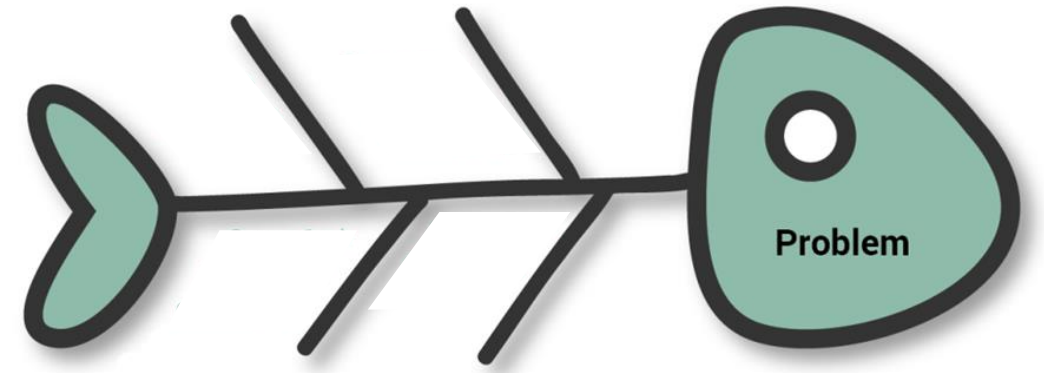


# Cause and Effect

## Diagram Creation

### 1 Identify the Problem

1. Name the problem or effect of interest. Be as specific as possible.
2. Use a solid Problem Statement: What, Where, How Long, How Many?
3. Write the problem at the head of a fishbone "skeleton".

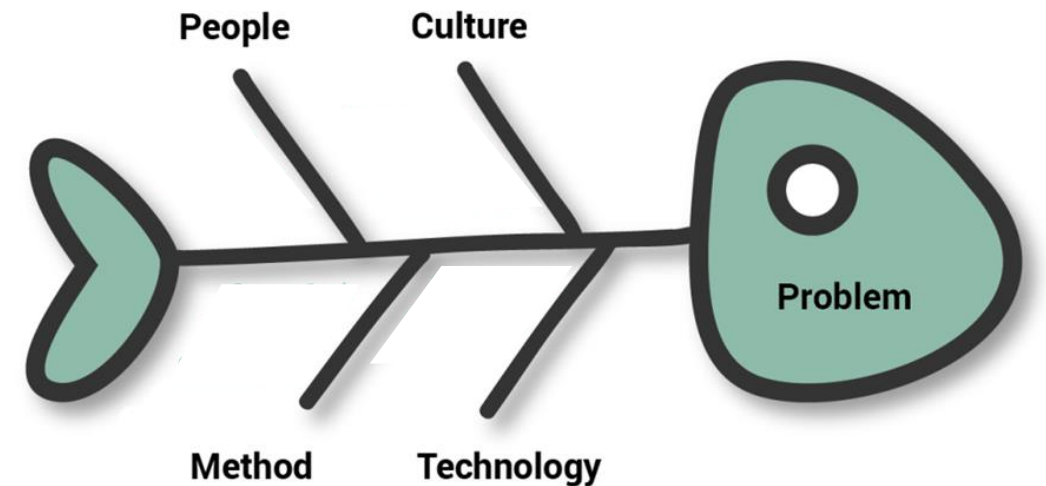


# Cause and Effect

## Diagram Creation



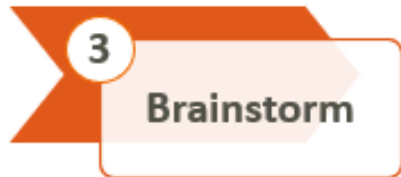
1. Decide the major categories for causes and create the basic diagram on a flip chart or whiteboard.
  - **6M (Manufacturing):** Manpower, Method, Materials, Machine, Mother Nature (Environment), Measurement
  - **4S (Services):** Surroundings, Suppliers, Systems, Skills
  - **7P (Marketing):** Product, People, Process, Promotion, Price, Packaging, Place



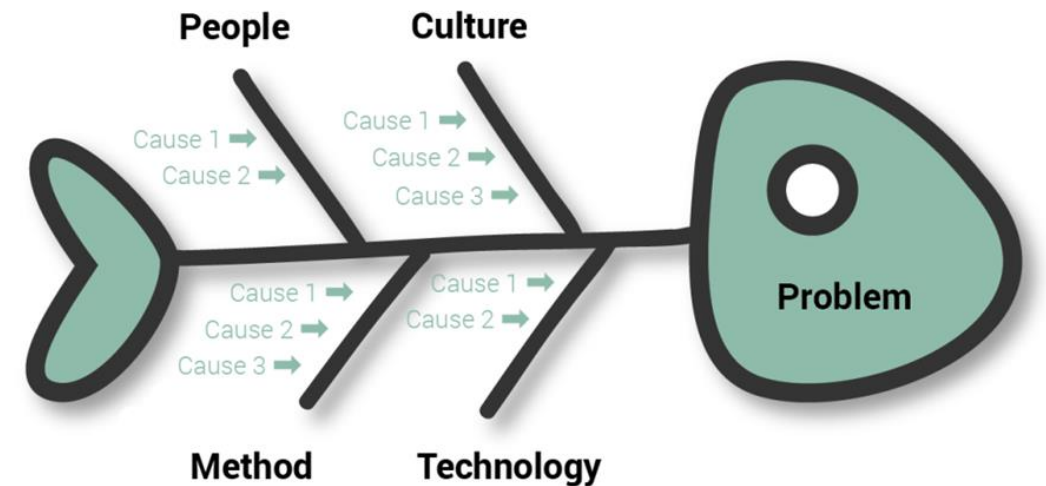


# Cause and Effect

## Diagram Creation

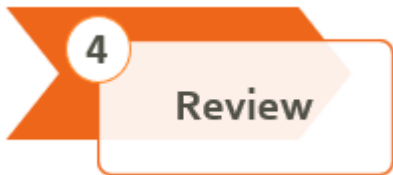


1. Discuss all potential causes and group them into categories and create the diagram.
2. Causes are added, with lines branching off from the main backbone at an angle.
3. Open brainstorming.
4. Sicky-Notes brainstorming.

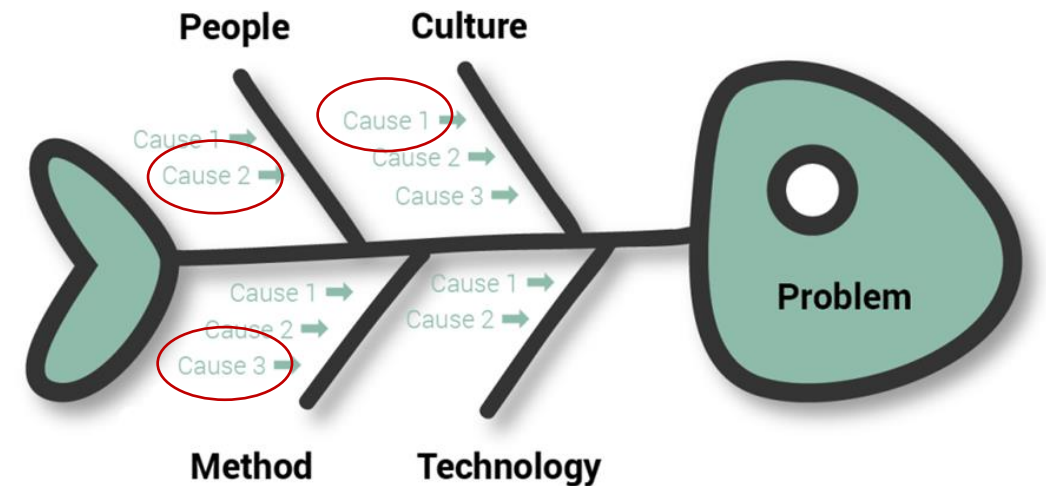


# Cause and Effect

## Diagram Creation



1. Review the diagram for completeness.
  - Eliminate causes that do not apply.
  - Brainstorm for more ideas in categories that contain fewer items.

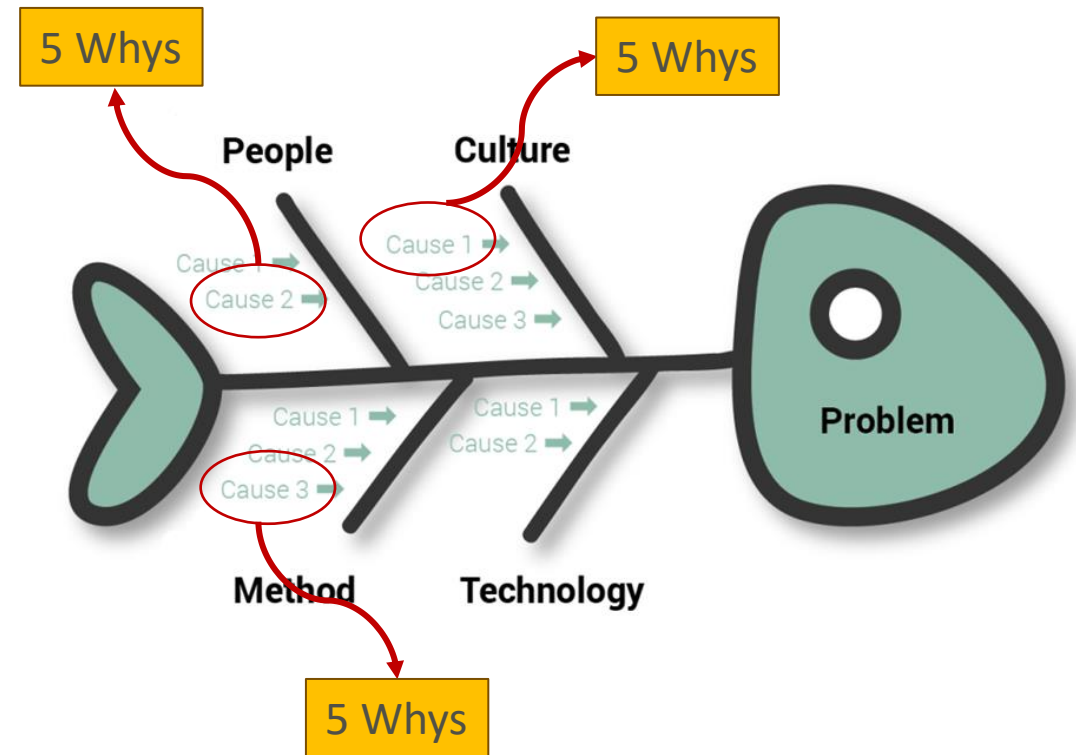


# Cause and Effect

## Diagram Creation



1. Use the 5Whys methodology to identify root causes the team think are most critical for follow-up investigation.
2. Is OK to rely on people's instincts or experience (we still need to collect data before acting).
3. Mark the causes the team plan to investigate.

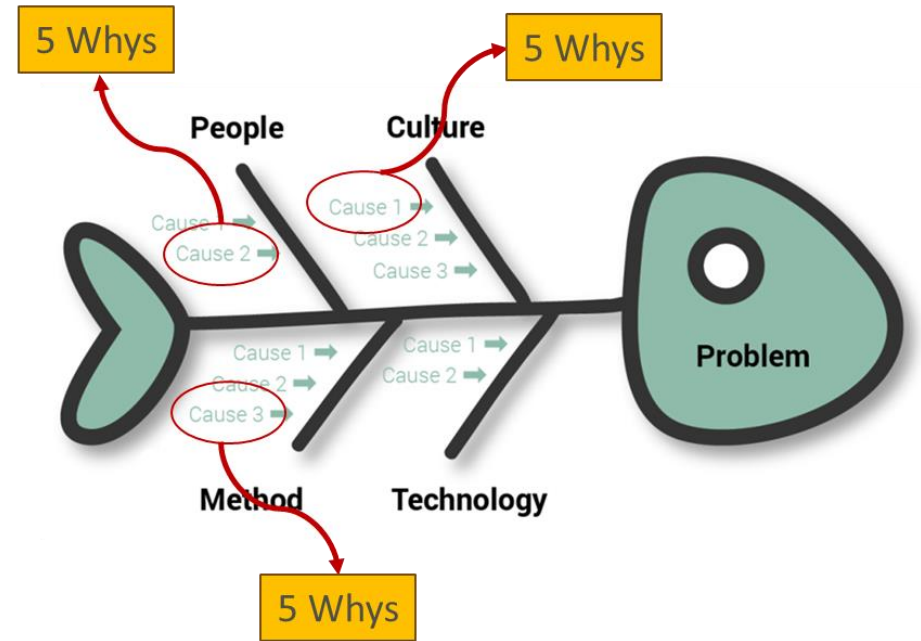


# Cause and Effect

## Diagram Creation

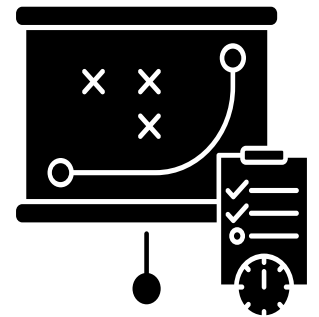
### 6 Confirm and Action Plan

1. Develop plans for confirming that the potential causes are actual causes.
2. Do not generate action plans until the team has verified the cause.



### Action Plan

Root Cause for People Cause 2:  
Root Cause for Method Cause 3:  
Root Cause for Culture Cause 1:



# Cause and Effect

## Analysis

1. Sometimes, the most apparent cause turns out to be minor, and the one that was thought to be minor is causing the issue.
2. The fishbone diagram considers all potential causes of a problem, instead of focusing on the obvious one.
3. We can continue adding sub-branches until we reach a satisfactory result. The collection of causes should be comprehensive.



**“What was the decision making process that led to hiring a cat?”**

# Cause and Effect

## Analysis

4. We should keep the following points in mind while developing a fishbone diagram:
  - We should **clear understand** the problem.
  - Team members should **be experienced** and **involved** with the problem.
  - The discussion should be **focused on** and **moderated** by the project manager.
  - Think of all potential causes for **each factor** and add them to the bone.
  - If any bone is bulky, try to **split it into two or three branches**.



**“What was the decision making process that led to hiring a cat?”**

# Cause and Effect

## Limitations


- A fishbone diagram does not prioritize a specific root cause of the problem because all causes **look equally important**.
- Effort can be wasted on identifying causes that have **little effect** on the problem.
- A fishbone diagram is based on **opinion** rather than evidence.
- This process **democratically** selects the cause, which may not be the most effective process.
- If we do not **control** the discussion, we could get incorrect results.



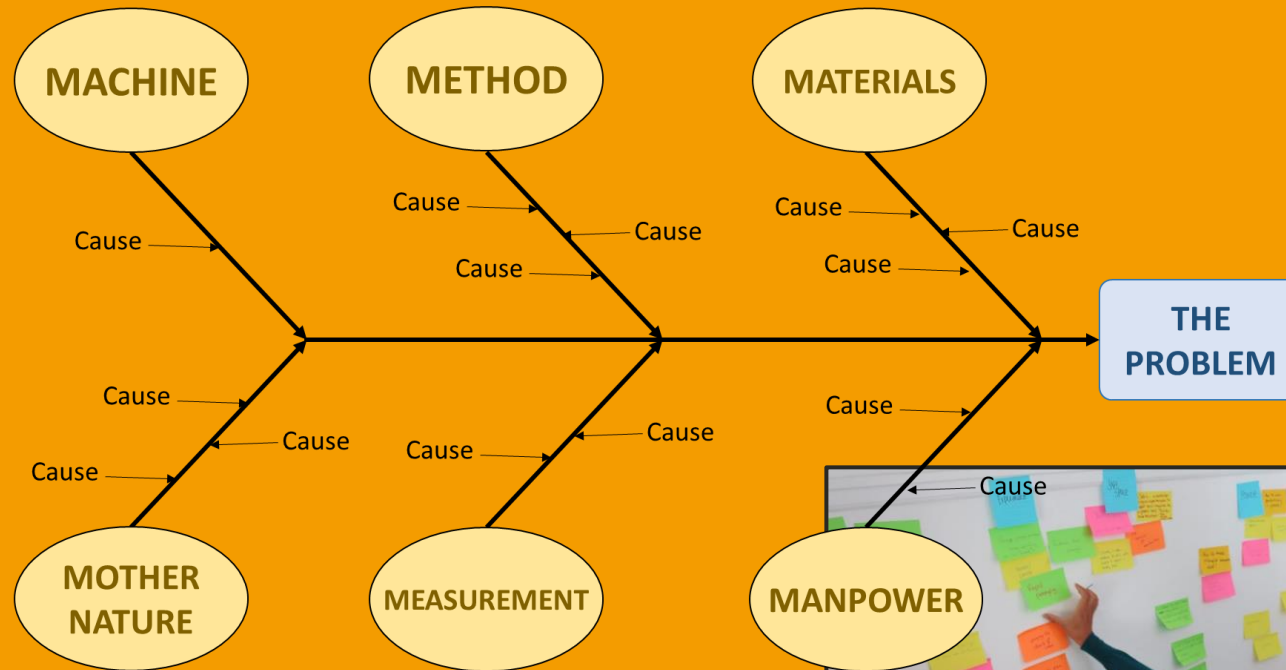


# Cause and Effect Game

**LEARNING HUB**



Cause-and-Effect Game





# Cause and Effect Worksheet

## TOOLBOX



## Cause-and-Effect Worksheet

Cause Effect Analysis (Fishbone Diagram)

<b>Project:</b> Low throughput, can not maintain targets		<b>Area:</b> pack 4	<b>Process Owner:</b> Mandish	<b>Business Category:</b> Manufacturing	<b>Date:</b> 7/12/2022
<b>Problem Statement:</b> The effect. The throughput is 35% lower than previous month and is YTD 27% lower than Target at 1,230 units/hr.					

1. Frequency of Failure by Cause		173
<b>Machine 65%</b>		<b>113</b>
arms jammed	23 (13%)	6 (3%)
conveyor waiting product (staring)	34 (19%)	12 (7%)
long startups	56 (32%)	
<b>Methods 10%</b>		
<b>Materials 0%</b>		
<b>Measurement 0%</b>		
<b>Manpower 23%</b>		
Training issues	12 (7%)	3 (2%)
Late	4 (2%)	
Temporary support	23 (13%)	
<b>Mother Nature 2%</b>		
Room is cold, product is affected		
<b>0%</b>		<b>0%</b>

**2. Result: Causes by Group**

Process Pack 4

5 WHYS ROOT CAUSE ANALYSIS WORKSHEET

**Problem:** Conveyor feed starving 43% of the time from machinery causes

**WHY IS THIS A PROBLEM?**

**PRIMARY CAUSE**

Why is it happening?

Bin too full

And this is happening, because ...

operator cannot keep up

And this is happening, because ...

not additional time to stack pouches and align them

And this is happening, because ...

bin too full

And this is happening, because ...

bin too full

And this is happening, because ...

stacking machine that the product directly into the bin

**PROPOSED CORRECTIVE ACTION:**

In the printing room, Receive the pouches on the backed conveyor and align the material into the bin to delivery stacked aligned to the production line

[Back to Worksheet](#)

Cause-Effect Diagram - Fishbone Diagram -

**Project:** pack 4

**Process:** Process Pack 4

**Area:** pack 4

**Process Owner:** Mandish

**Date:** 7/12/2022

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# Takeaways

- Although the Cause and Effect diagram is time-consuming, the **benefits are enormous**.
- Combine the Diagram with a **solid 5Why Methodology**.
- Always **involve the experts** in the process, aka; the operators, the customer service people, the users, the clients.
- Give priority to the causes that generate the major “pains”. Focus on **high impact-low effort actions first**.
- Always develop an **Action Plan and use the 3Ws** to track results (Who, What, When).
- Sometime the cause may require to start a formal **Improvement Project**. Trigger the business case.



Thank You



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# Cause and Effect



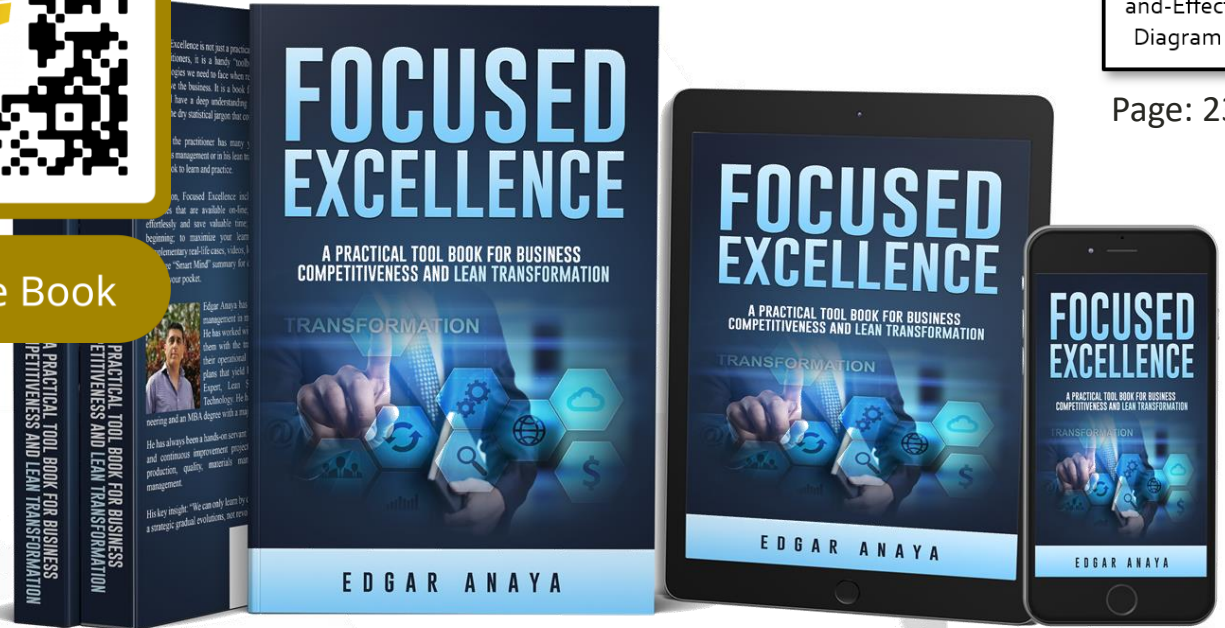
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A Practical Tool Book for  
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