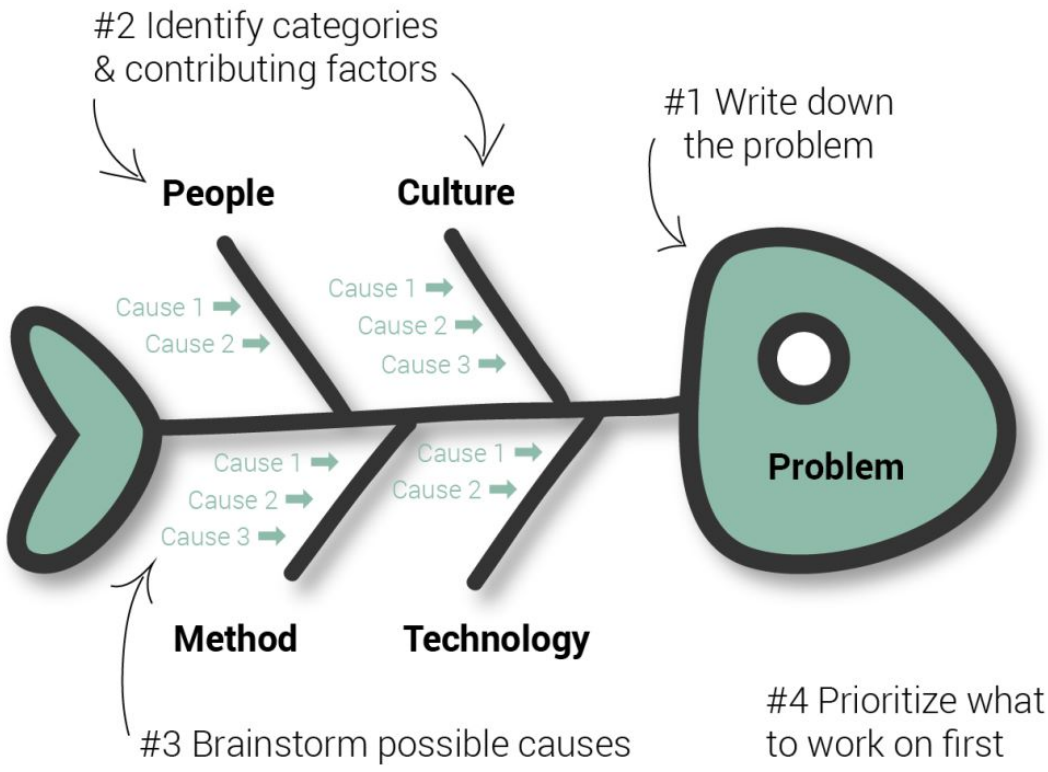
Root Cause Analysis. The fishbone Diagram



Introduction

A fishbone diagram, also known as a cause-and-effect diagram or an Ishikawa diagram, is a valuable tool utilized in problem-solving to identify the root causes of an issue. During this lesson you will learn how to use it and how to creat one.

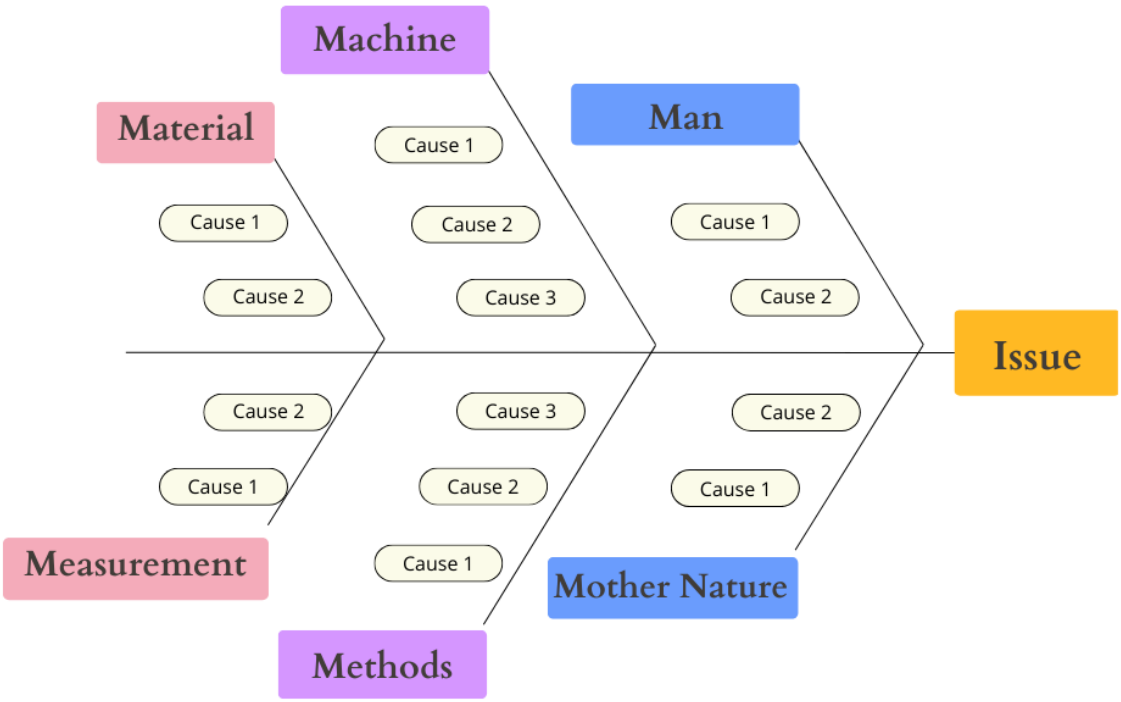
What is a Fishbone Diagram?

As mentioned before, the Fishbone Diagram is a problem solving tool that helps identify the root cause of an issue. It visually represents the potential causes of a problem in a systematic and organized manner. The diagram takes its name from its distinctive shape resembling the skeleton of a fish, with the problem being depicted as the "head" and the causes branching out like "bones."

Managers use it for identifying, brainstorming and braking down the possible causes of a problem or defect

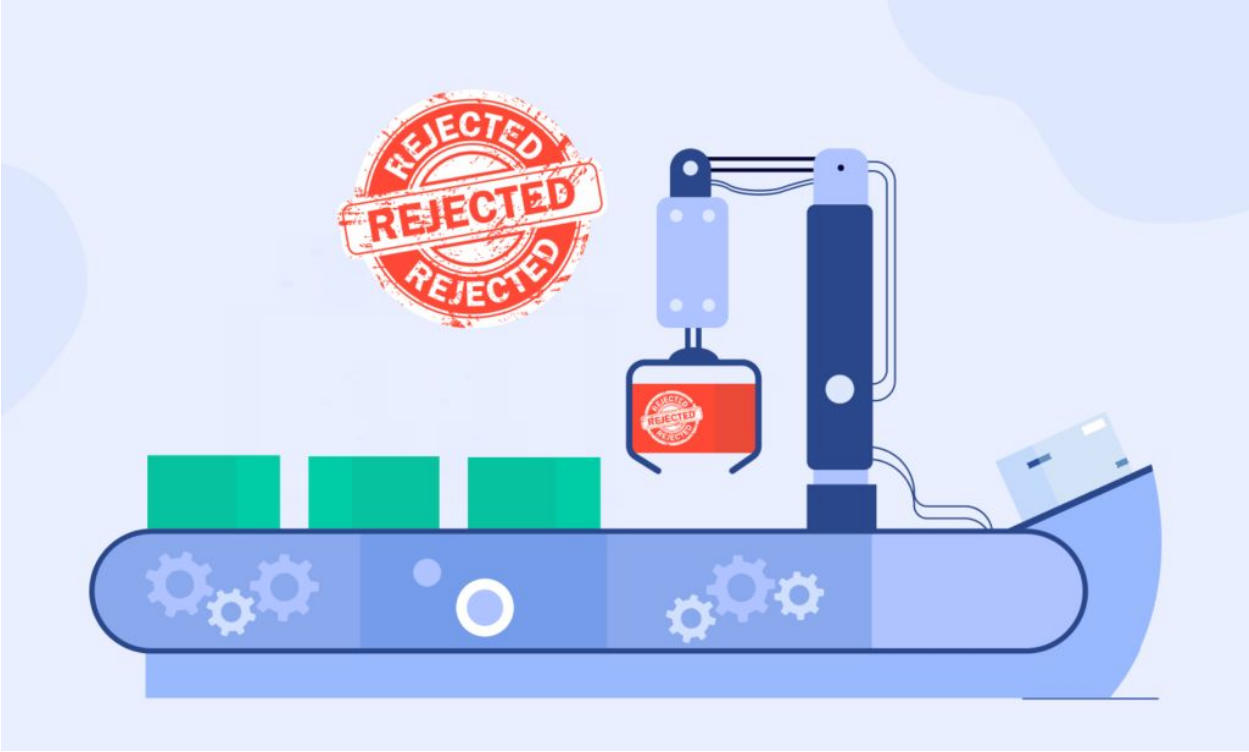
- Define the problem at the head of the fish we define the problem
- Analyze the major contributing factors at the ribs where we list the main categories we want to analyze or the major contributing factors to the problem
- List the potential rootcauses in the spaces in between the ribs like illustrated below
- List as many potential root causes and categories as you need

Thanks to Kaoru Ishikawa, the Fishbone Diagrams are among the 7 essential quality tools today. They are used across industries with a focus on quality control and product design.



What is the purpose of a Fishbone Diagram?

The Fishbone Diagram can serve as a brainstorming tool to identify possible defects or variations in the process.



- Although the Fishbone diagram is a problem solving tool, it is actually mostly used to prevent problems.
- The way this diagram prevents problems is by identifying elements that might cause avariation in your process and potentially contribute to problems in your product.

Factors causing variation

A Fishbone Diagram can help you identify factors that can alter your process.

The most common categories for the factors causing variation are the following, usually called the 6Ms, especially useful in manufacturing:

- Machine
  - Tools
  - Facilities
  - Computers
  - Equipment
- Method
  - Process
  - Standard Procedures
- Material
  - Items you need to deliver the product
  - Raw materials
  - Consumables
  - Information
- Measurement
  - KPIs
  - Data
  - Inspections
  - Other measures of your process
- Manpower
  - The people involved in the process

- Mother Nature
    - Environmental factors that can affect the process
        - Manageable
        - Unmanageable
- The causes of variation differ depending on the industry, if you are not in manufacturing, you might need to adapt the causes to your needs.

For Marketing you can use the 8Ps as the factors that can cause variation:

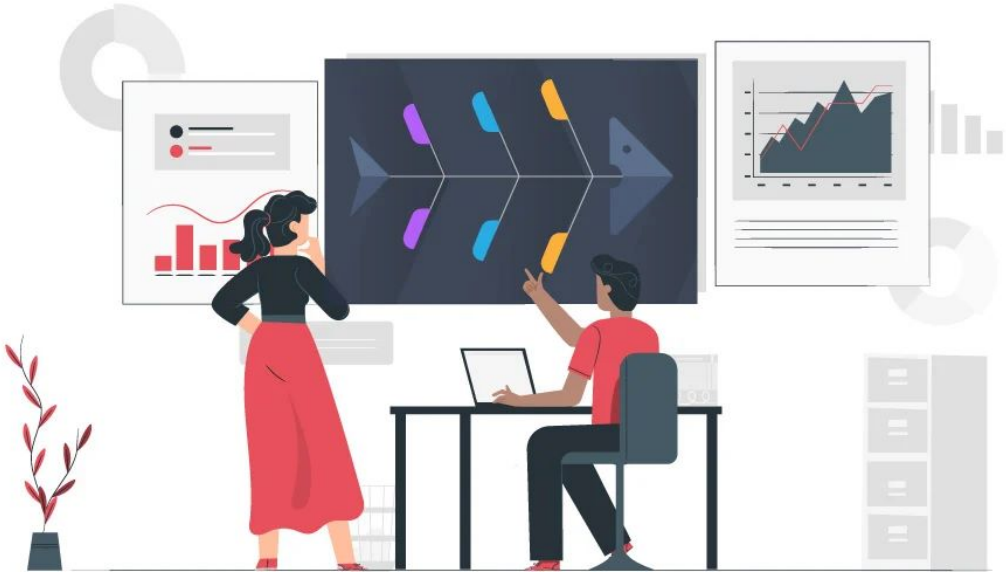
- Product or Service
- Place
- Price
- Personnel
- Promotion
- Process
- Proof
- Performance

For the service industry, you will need the 5S:

- Systems
- Surroundings
- Suppliers
- Skills
- Safety

How to develop a Fishbone Diagram?

There are a few critical steps to building a Fishbone Diagram:



Step 1: Define the problem or create a problem statement

- Clearly state how, when, and where the issue occurred or has the potential to occur. Make sure the team is on agreement regarding the problem statement.
- The problem statement goes at the head of the fish

Step 2. Brainstorming session

- Brainstorm possible causes to the problem
- Analyze which of the previously listed factors affect your process
- For each potential cause you identify, add a line to the spine and label it

Step 3. Identify the root causes

- Identify the root causes to the factors listed in the previous step
- Once you have the root causes, attach them as branches to the ribs
- The skeleton will look complete after this step

Step 4. Analyze your structure

- Look at each potential cause closely to see if it can really affect your business
- At this state you can use the 5 whys tool

Benefits of using Fishbone Diagrams

Once the brainstorming session is over, it is a good idea to outline the actions that will be taken below the fishbone diagram, who is that task assigned to, and what is the status of that task (to-do, in progress, done)

There are several benefits to using the Fishbone Diagram:

- It encourages a holistic understanding of the various interrelated factors that can influence the occurrence of an issue
- It gives room for brainstorming
- It helps the team consider all the possible causes of a problem
- It helps resolve issues by identifying the root cause
- It helps identify problems in business processes