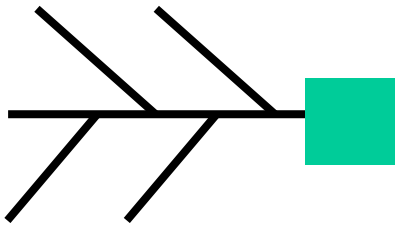
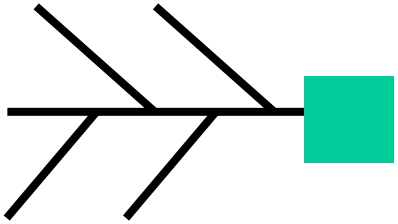
Continuous Improvement Toolkit

Fishbone Diagram




Managing Risk
PDPC
FMEA
RAID Logs
Fault Tree Analysis
Risk Assessment*
Traffic Light Assessment
Deciding & Selecting
Pros and Cons
Importance-Urgency Mapping
Break-even Analysis
Cost -Benefit Analysis
Force Field Analysis
Voting
Pugh Matrix
Decision Tree
TPN Analysis
QFD
Matrix Diagram
Kano Analysis
Prioritization Matrix
Critical-to Tree
Paired Comparison
Planning & Project Management*
RACI Matrix
Stakeholders Analysis
PEST
PERT/CPM
Activity Diagram
SWOT
Roadmaps
Project Charter
Gantt Chart
PDCA
Control Planning
Gap Analysis
Hoshin Kanri
Kaizen
How-How Diagram
Tree Diagram**
Standard work
Lean Measures
KPIs
OEE
Capability Indices
MSA
RTY
Descriptive Statistics
Cost of Quality
Reliability Analysis
Graphical Analysis
Cause & Effect Matrix
Pareto Analysis
Confidence Intervals
Understanding Cause & Effect
Probability Distributions
ANOVA
Hypothesis Testing
Design of Experiments
Scatter Plot
Correlation
Regression
5 Whys
Chi-Square Test
Multi-Vari Charts
Relations Mapping*
Fishbone Diagram
TRIZ***
Identifying & Implementing Solutions***
Simulation
TPM
Mistake Proofing
Pull Systems
JIT
Ergonomics
Work Balancing
Automation
Bottleneck Analysis
Visual Management
Flow
Value Analysis
5S
Wastes Analysis
SMED
Time Value Map
Process Redesign
IDEF0
Value Stream Mapping
SIPOC
Flow Process Chart
Process Mapping
Flowcharting
Service Blueprints
Designing & Analyzing Processes
Understanding Performance
Run Charts
Control Charts
Benchmarking
Sampling
Data Collection
Focus groups
Interviews
Photography
Check Sheets
Measles Charts
Surveys
Critical Incident Technique
Observations
Brainstorming
Analogy
SCAMPER***
Nominal Group Technique
Mind Mapping*
Affinity Diagram
Attribute Analysis
Lateral Thinking
Visioning
Creating Ideas**

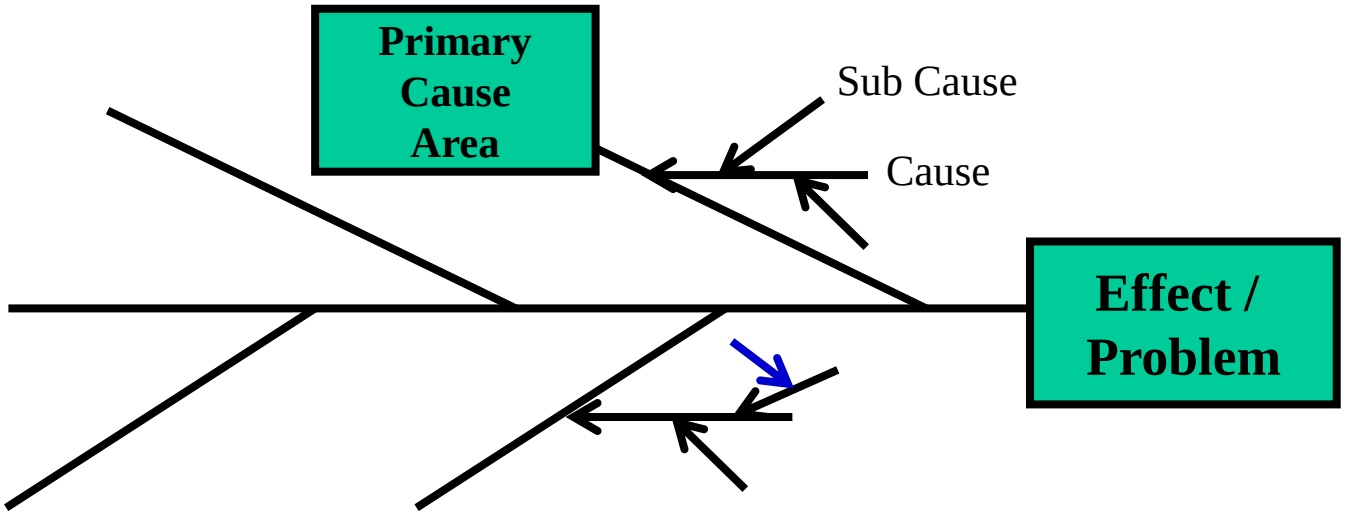
- Fishbone Diagram



- Solutions to problems are often not easy to find.
- Those that at first appear to be obvious may address only symptoms.
- Used to identify and structure the causes of a given problem.
- Identifying causes as an intermediate step:
  - Make it more likely to address the problem.
  - Makes solutions easier to find.
- Usually used during Brainstorming sessions.
- May indicate a lack of general understanding of the problem.

- Fishbone Diagram

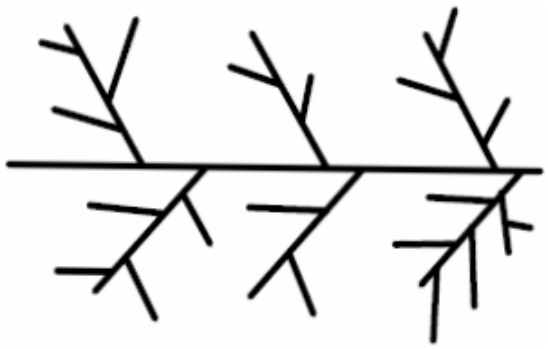
- Uses a specific layout to display the hierarchy of causes.
- One cause may also be caused by a combination of other causes.



- Fishbone Diagram

- Provides initial input to later problem solving tools.
- Minimizes the need for more statistical evaluation of inputs that are unlikely to have an impact on the output.

- **Root causes** are normally:
  - Those at the ends of chains of causes.
  - They do not have any sub-causes.



- Fishbone Diagram

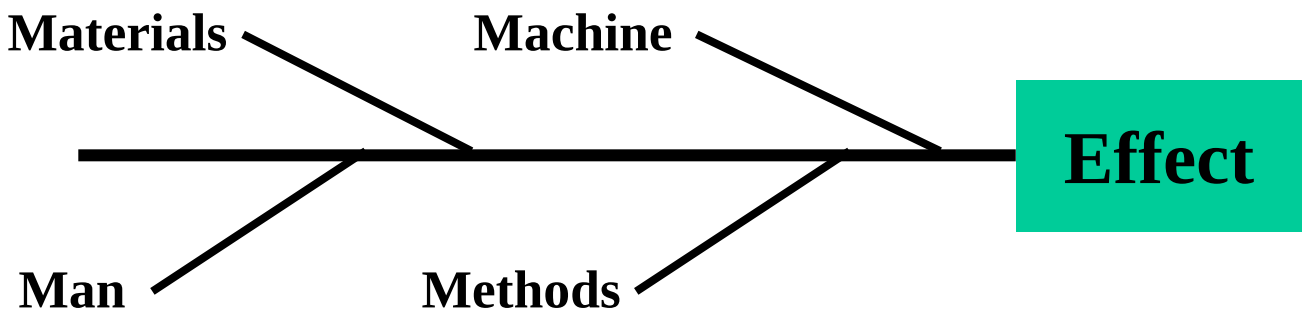
When to Use It?

- When investigating a problem.
- When the possible causes are not clear (structuring thoughts).
- To gain a common understanding of the causes.
- To understand the relationship between inputs and outputs.
- To get more understanding of the factors that affect the output of the process, even if there is no problem found.
- In orientation and training sessions.

- Fishbone Diagram

Approach:

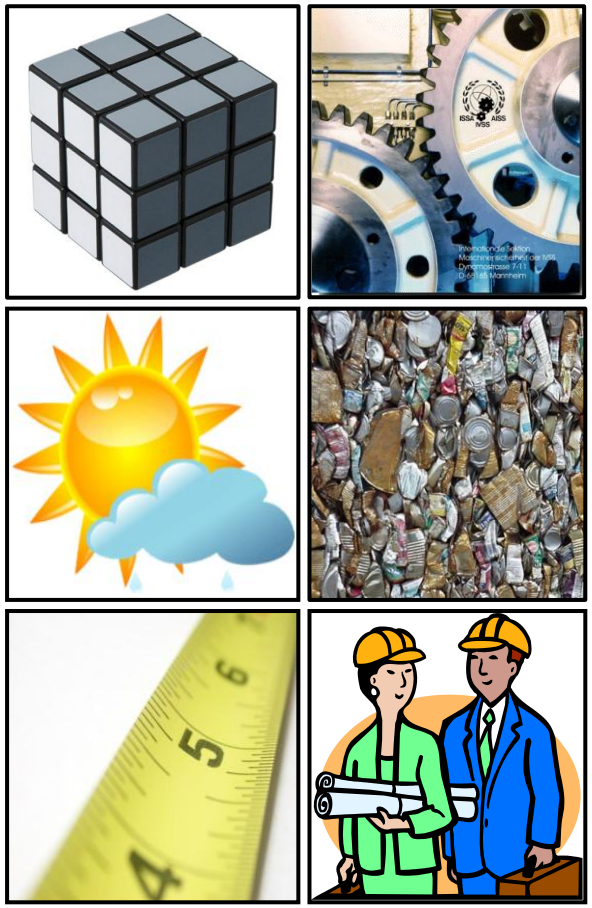
- Conduct a meeting to gain a common understanding.
- Define the effect of the problem.
- Write down effect at the center-right of the page.
- Draw the main cause area. The "**Four Ms**" (Man, Methods, Machines and Materials) provide a good start.



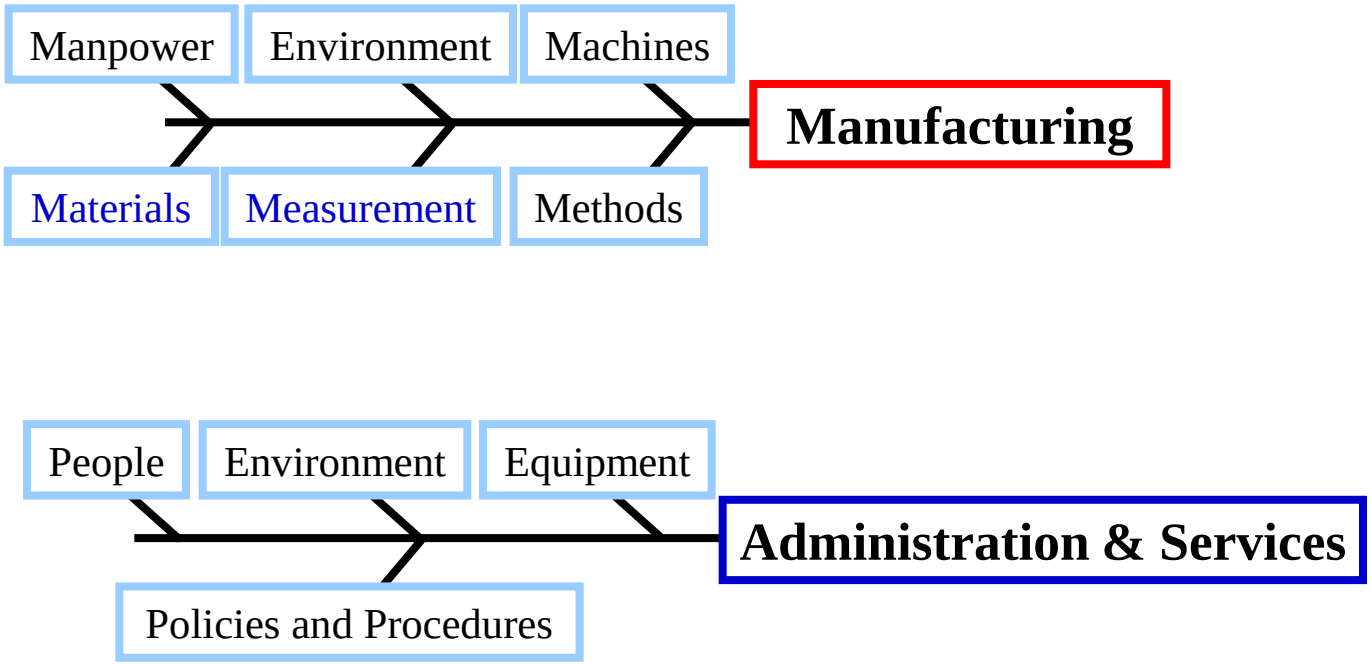
- Fishbone Diagram

Approach:

- Use Brainstorming to build the diagram.
- Look for and circle key causes which require further attention.
- Use **Voting** if there is no agreement.
- Put numbers next to each key causes to show their relative priority.
- If necessary, gather data to confirm key causes are real.
- Plan and implement actions to address key causes.

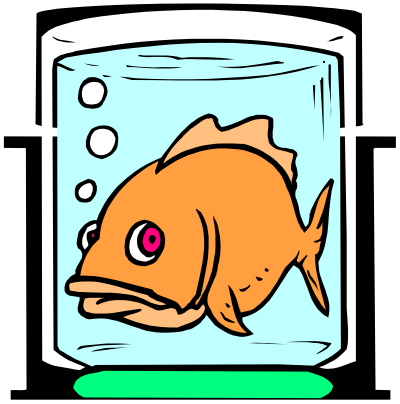


- Fishbone Diagram



- Fishbone Diagram

- Causes need to be verified as being actual causes.
- Beware of adding causes which are actually solutions.
- Beware of things which are knock-on effects, such as 'Dissatisfied staff‘.
- Avoid having too many key causes.
- This may result in defocused activities.
- A pretty fishbone diagram should not be your first objective.
- A **Cause and Effect Matrix** could be used later to prioritize the causes.



- Fishbone Diagram

Ways of finding more causes include:

- Keep asking Why?
- Look at the diagram without talking.
- Look for patterns.
- Involve other people, especially those who have expertise in the problem areas.
- Leave the chart on the wall for a few days and encourage passers-by to contribute.

- Fishbone Diagram

Example – Claim Processing Cycle Time Too Long: