ISHIKAWA DIAGRAM = CAUSE AND EFFECT DIAGRAM

What is the Ishikawa Diagram?

The Ishikawa Diagram is a tool that helps to identify the causes of a problem. One has an overall view of the causes that generate a problem with a structured representation of all the causes that produce effects. The hierarchic relationship between causes is established and one is able to identify the root causes of a problem.

The Ishikawa diagram, (or fishbone diagram, cause and effect diagram or 5M) reduces the risk to forget some causes and provides input for the study of solutions. This method makes it possible to tackle the causes, to correct defects and provide solutions by employing corrective actions.

Golden Rules

- **Working group** = Before one begins, one has to form a multidisciplinary working group and encourage each member to participate.
- **Brainstorming** = It is recommended to do a brainstorming session to find all the causes of the problem. Each member can freely express their opinion.
- **Approach** = As the next step, it is necessary to find the causes responsible for the problem and to classify them according to their relationship with the problem.

Structure of the Ishikawa diagram

- **Step 1:** Clearly define the problem
  - Draw a horizontal arrow pointing at the problem.
- **Step 2:** Sort the causes in big families
  - Material: raw material, quality, supply, pieces, etc.
  - Machine: machinery, tools, equipment, maintenance, etc. identifies the causes that originate from technical support and used products.
  - Man power: direct, indirect, motivation, training, absenteeism, experience, competence problems, etc.
  - Environment: physical environment, light, noise, dust, location, layout, temperature, legislation, etc.
  - Method: instructions, manuals, procedures, used modus operandi, etc.
  - One can add two additional criteria to the 5M (Management and financial means) to get 7M.
Step 3: Secondary arrows

These secondary arrows correspond to the number of identified families of causes. They must be connected to the horizontal arrow. Each arrow identifies one of a potential family of causes.

Step 4: Mini arrows

The causes associated to one of the families are inscribed on the mini arrows. One needs to identify all potential causes.

Step 5: Finalisation

One must seek the real root of the problem among the potential causes. One has to act and correct by proposing solutions.

Example: