What Is a Cause-and-Effect Diagram?

A graphic tool that helps identify, sort, and display possible causes of a problem or quality characteristic.
Benefits of Using a Cause-and-Effect Diagram

- Helps determine root causes
- Encourages group participation
- Uses an orderly, easy-to-read format
- Indicates possible causes of variation
- Increases process knowledge
- Identifies areas for collecting data
Basic Layout of Cause-and-Effect Diagrams

- CAUSE A
- CAUSE B
- CAUSE C
- CAUSE D
- EFFECT
Step 1 - Identify and Define the Effect

- Decide on the effect to examine
- Use Operational Definitions
- Phrase effect as
  - positive (an objective) or
  - negative (a problem)
Step 2 - Fill in the Effect Box and Draw the Spine

POOR GAS MILEAGE
Step 3 - Identify Main Categories

- METHODS
- MACHINERY
- PEOPLE
- MATERIALS

POOR GAS MILEAGE
Step 4 - Identify Causes Influencing the Effect

METHODS
- DRIVE TOO FAST
- USE WRONG GEARS
- CARBURETOR ADJUSTMENT
- POOR MAINTENANCE
- POOR DRIVING HABITS

MACHINERY
- UNDERINFLATED TIRES
- IMPROPER LUBRICATION
- WRONG OCTANE GAS

PEOPLE

MATERIALS

POOR GAS MILEAGE
Step 5 - Add Detailed Levels
Step 6 - Analyze the Diagram

CAUSE-AND-EFFECT DIAGRAM

POOR GAS MILEAGE

METHODS
- Use wrong gears
- Drive too fast
- Always late
- Impatience
- Poor hearing
- Radio too loud

MACHINERY
- Fuel mix too rich
- Mech. doesn’t know correct adjustment procedures
- Carburetor adjustment
- Underinflated tires
- Poor design

PEOPLE
- Poor maintenance
- Poor training
- "When in Rome"
- Poor driving habits
- No awareness

MATERIALS
- Wrong octane gas
- No oil change
- Wrong oil
- No oil
- Improper lubrication
- Don’t know recommended octane
- Don’t know right oil
- No owner’s manual

VIEWGRAPH 8
Example of How the Cause-and-Effect Diagram Could Be Constructed for the Detailed Exercise

SOFTWARE
- Faulty Design
- Inadequate Documentation
  - Faulty Installation
  - Inadequate Power

HARDWARE
- Power Fluctuations
  - Component Failure
  - Component Abuse

ENVIRONMENT
- Humidity
  - Temperature Gradients

USERS
- Misapplication of Software
  - Lack of Training
  - Abuse of Hardware

COMPUTER DOWNTIME
- Corrosion
- Mechanical Shock