

Cause and Effect (Fishbone) Diagram

Cause-and-effect diagram

- Aids in organizing many potential causes.
- Encourages broad thinking.
- Is best used once you have a defined the problem.
- May also be used to prevent future problems.

Steps

1. Name the problem or effect that is being investigated. Be as specific as possible. Write the effect at the head of a fishbone diagram.
2. Decide the major categories for causes. Typical categories are: personnel (manpower or staffing), machines, materials, methods (processes), and environment.
3. Brainstorm for more detailed causes and add the causes to the diagram. Then, either:
 - a. Work through each category and brainstorm potential causes; ask why each major cause happens, or
 - b. Brainstorm (individually or as a group); come up with ideas in any order. Arrange in the fishbone diagram, placing each idea under the appropriate category.
4. Review the diagram for completeness. Eliminate causes that do not apply. Brainstorm for additional unidentified causes.
5. Discuss the final diagram. Identify the causes that are most important for additional investigation. Mark the causes that will be investigated.
6. Develop plans for confirming that the potential causes are actual causes. **Do not take action** until you have verified the cause.

Verifying potential causes

Emphasis is on data analysis to verify whether a cause and effect relationship exists and how strong it is. It is important to the success of an improvement project to confirm whether an identified potential cause actually contributes to the problem. Before proceeding, confirm a cause-and-effect relationship.

Event investigation

Detailed investigation following an event

- Include all staff members involved. Each staff member should tell what he/she did or observed.
- Include a review of documentation.
- Develop timelines as appropriate.

Identify

- Technical factors
- Organizational factors
- Human factors
- Other factors

The Fishbone Diagram

- The cause-and-effect (fishbone) diagram starts with the problem at the head of the fish.
- Under each general category of the fishbone, answer the question, “Why?” for the identified problem.
- Once the fishbone diagram is completed, the various causes are discussed to determine the root of the problem or the real reasons why the problem exists. It is from this discussion that the focus for the improvement plan begins.

