Fishbone and 3 Thinking Apps.

The now classic Fishbone Diagram (aka: The Cause-Effect diagram or Ishikawa Diagram) was introduced by Mr. Ishikawa of the University of Tokyo in 1943, 74 years ago, Although some people refer to this diagram as Fishbone "Analysis" there is no analysis. This tool is very much alive in American Business, now being used as a Problem-Solving tool which enjoys widespread familiarity with problem solving teams of most types. It became part of the collection of tools used originally by Toyota's factory teams.

The Fishbone provides categories (e.g. machine, method, material, measurement, people) into which the team lists possible causes. For example, "How might machines have caused this problem?" "How might people have caused this problem?" Causes of causes are sometimes added by using the "5-Whys" technique on one or more possible causes. The categories can be tailored by industry or situation. The Fishbone gained widespread use in quality circles in the USA because of the desire to involve team members and get their input. This was an attempt to tap the knowledge and thinking of workers correcting an imbalance. In the 1970's in the USA management often decided what to do about problems without any systematic attempt to get information from or consult with workers. It is hard to imagine now, but "way back when" consultants had to sell the idea of just getting data and information to aid with decision making. Another positive aspect of the Fishbone process is that the categories encourage teams to consider a broad range of possible causes of the problem under investigation.

Fishbone's Weaknesses

1. A Fishbone is an excellent structured brainstorming tool. It is not an analysis tool (not a critical thinking tool). Right frontal brain involvement not left.

2. The Fishbone's purpose and strength (i.e. the generation of a wide range of possible causes) leads to a point of frustration – it is missing a valid means to evaluate the many possible causes it generates in a quick and easy manner. It is a **divergent** tool not a **convergent** one.

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3. The Fishbone provides **no structure for forming possible causes**. It is often not clear how a proposed cause would produce the problem thus making it hard to fully understand or to evaluate it.

4. Voting is sometimes used to select the most likely cause. While voting represents the team members' judgments, it is also true that **dueling intuitions** is not a satisfactory method for finding the true cause of a problem.

5. Teams sometimes **fix or investigate ALL possible causes** on their list. Given a list of many possible causes, this is tedious, resource intensive, time wasteful and unnecessary.

6. Use of the 5-Whys with the Fishbone to find root cause(s) has the same limitations: **"5-Whys" is also not an analysis tool** and it does not provide a way to find or validate the answer to any "Why" question

7. One can only take corrective actions when the true cause of the problem is known (i.e. validated). Therefore, any action taken to correct the possible causes listed in a Fishbone is a **Muddled Action** not a Corrective.

Critical Thinking Apps.!

What's a Thinking App? We define a THINKING APP as a set of specially designed QUESTION(s) that focus your thinking and the thinking of your team to work together to accomplish a common purpose. The constraint the FISHBONE TEAMS are struggling against is that the FISHBONE is not a complete problem solving tool. It is a brainstorming tool for involving everyone in listing possible causes to consider. Therefore, if you must use the Fishbone Diagram then **only use the Fishbone for its original purpose** generating many potential causes covering a wide range of sources.

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CRITICAL THINKING APP #1: DESCRIPTION.

First describe the Problem including these categories: WHAT? WHERE? WHEN? & MAGNITUDE?

Next, generate high quality potential causes. Logic tells us that once we describe the Problem Area we should look there for what is Different about the problem area that could cause the problem. And if the problem has not always existed then something must have changed.

CRITICAL THINKING APP #2: POTENTIAL CAUSES.

Create potential causes this way "What is different or changed about [this FISHBONE category] and how could that cause this problem?"

For example, "What is different or changed about 'machinery' …? Or "What is different or changed about 'workers' …? This logical approach yields fewer but higher quality Potential Causes.

The next challenge is how to evaluate the list of potential causes to find the most likely cause. The logic we use states that the most likely cause will fit the facts best. The facts we are referring to are the facts in the DESCRIPTION. Note each unexpected fact for each Potential Cause. The one with the fewest unexpected facts is "the one that fits the facts best" by definition and therefore is the Most Likely Causes.

CRITICAL THINKING APP #3: MOST LIKELY CAUSE.

Teams with **Systematic Problem Solving Training** produce fewer but higher quality Potential Causes and you can evaluate them using logic, experience, judgment, and facts. Verification is focused on the Most Likely Causes saving time and resources.

The hallmark of the Fishbone is involvement of team members in thinking. Harness their wisdom and give them more to think about. Brainstorming is step #2

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of a four-step logical problem solving process. Learn the whole process from us! **Upgrade your team's thinking technology** with our online or standard classroom workshops.

Teams with **BPI Systematic Problem Solving Training** produce fewer but higher quality Potential Causes and you can evaluate any Potential Cause using logic, experience, judgment, and facts. Verification directs your efforts to the Most Likely Cause(s) saving time and resources.

The hallmark of the Fishbone is involvement of team members in thinking. Avoid the pain and harness their wisdom with our logical thinking structure. Give them more to think about and see where that can take you!