

Asking "Why?" Five Times

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The question posed by the title of this column may be "Why would I want to do that?" If you are familiar with root cause analysis, you already know. However, for the rest of us, let's examine the reason.

Why do we want to spend our time getting to the root cause(s) of environmental problems that we identify through process mapping? Because it will help us understand what we need to know to solve the problems.

Why do we want to understand what we need to know when we can just act on our intuition and solve the problem right away? Because we can work as a team to collect the specific information that we will require not only to solve the problem but also to prevent its recurrence.

Why do we want to take the time to gather all this information? By collectively analyzing the information, we will better understand the underlying causes of the problem.

Why do we want to understand the underlying causes? Because this will help put the team in a better position to get past the symptoms and understand the root cause(s) of the problem.

Why do we wish to get past the symptoms? Once the root cause is identified, the solutions (alternatives) will easily follow.

THE IMPORTANCE OF ROOT CAUSE ANALYSIS

Root cause analysis often is omitted from problem-solving methodologies, frequently because of concerns about taking too much time. Few people really

understand root cause analysis, or see the benefits that can be realized by using root cause tools. Maybe the following anecdote can help explain the advantages offered by root cause analysis.

I was working with a metal rolling mill that had a problem of generating more metal than was needed to make a coil of metal. This waste, called "excess prime," was very costly since much added value was put into it, which then had to be scrapped at pennies on the dollar.

Two teams were assembled to deal with the problem, both very familiar with the issues surrounding excess prime. One team discussed the problem and then generated four alternatives that they felt would solve the problem. The second team worked on the root cause of the problem first, and then generated 27 alternatives that they thought would contribute to the solution.

When the two teams met to choose their list of "top ten" potential solutions, none of the four alternatives named by the first team made the cut. During the meeting, as the second team's ideas were put forth, the members of the first team kept asking, "Why didn't we think of that?"

Welcome to the world of root cause analysis!

USING ROOT CAUSE ANALYSIS

There are many tools used in the field of root cause analysis (see **Exhibit 1**). There is an article about one of them, cause-and-effect diagramming, on my website at <http://www.Pojasek-Associ->

Exhibit 1. Root Cause Analysis Tools

- Cause-and-Effect Diagrams
- Five Whys
- Management Oversight and Risk Tree Analysis (MORT)
- Event and Causal Factor Analysis
- Tree Diagrams
- Change Analysis

ates.com. This column concentrates on another root cause analysis tool: the Five Whys.

I should note here that there are a number of popular books available on root cause analysis. However, many of them deal only with finding the cause of accidents, and do not deal specifically with general problem-solving issues.

The “root cause” refers to the most basic reason for the problem that you are considering—such as repeated violations of a regulatory requirement or the release of a volatile organic compound from a particular operation. If this basic reason is identified and corrected, you can prevent the recurrence of the problem altogether.

Use of root cause analysis helps problem-solving teams use higher order

thinking skills. Root cause analysis can also help you cut through layers of bureaucracy to find the true meaning of the problem and allow people to solve it. Finally, root cause analysis encourages people to challenge the problem and more effectively address the issues associated with it.

One obstacle to identifying root causes is that many organizations do not adequately support team-based initiatives. Often, people take the attitude that “it is not my problem to solve.” This is where teams and their synergy are essential to successful problem solving. Teams should approach problem solving with the mindset that the problem should not happen again.

THE FIVE WHYS

The Five Whys have been used as a root cause tool for many years. The approach uses a systematic questionnaire technique to search for root causes of a problem. You use the tool by asking “why?” at least five times as you work through various levels of detail. Once it becomes difficult to respond to “why?” the probable cause of the problem may have been identified (see the example in **Exhibit 2**).

Exhibit 2. Five Whys Applied to a Financial Example

Problem: I am being turned down for risk capital.

Q: Why am I being turned down?

A: Because no investor wants to back my business.

Q: Why don't investors want to back my business?

A: Because they do not see the true potential in my business.

Q: Why don't investors see the true potential in my business?

A: Because they are not getting the proper information and facts about the business that they need in my investment proposal.

Q: Why are they not getting the proper information and facts about the business they need?

A: Because my investment proposal is not very effective and complete.

Q: Why is my investment proposal not very effective?

A: Because I have not sought advice from someone with experience and knowledge who may be able to help me create an effective investment proposal.

Feel free to continue asking questions until you can no longer come up with an answer. Your final answer should be close to the root cause of the problem.

As you trace the “whys?” back to their root cause, you will find yourself confronting issues that affect not only the original symptom, but also the entire organization. One of the benefits of the Five Whys exercise is that it trains people to recognize the difference between an event-oriented explanation and a systemic explanation. Systemic explanations are the ones that, as you trace them back, lead to the reasons why the problem exists. By contrast, an event is simply something that happens, and may or may not have a systemic issue associated with it. It may turn out that 12 different symptoms can be traced back to two or three systemic sources. Tracing these paths will probably help you find issues that affect the whole system.

To be effective, the team’s answers to the Five Whys must steer away from blaming individuals. Blaming individual people leaves you with no option except to punish them—and this leaves no room for substantive change. Be careful not to ask “who?” The focus is on the process of the problem, not the person involved.

To avoid being distracted by event- or blame-related “answers,” try this technique: As each answer is recorded, ask, “Okay, is that the only reason?”

As you can see, it is often wise to use a facilitator to work with the problem-solving team when they use the Five Whys. One thing the facilitator should focus on is ensuring that the team does not get into a “circle” with the questioning process. This happens when teams make their answers “re-entrant,” so that the reply to question four or five is the answer to the first “why?” When this happens, it sometimes means there is a sensitive issue that is either beyond the team’s control or damaging to their own position. It is the duty of the facilitator to help the team face these situations.

Even after asking “why?” three times, you generally are still dealing

with symptoms, not the cause. It is the fourth and fifth “whys?” that begin to expose the cause. For this reason, there often is a significant lag between the team’s answers to the third and fourth inquiries. Unless the facilitator is attentive, the team may attempt to evade the proper response at this stage.

It is also helpful to follow the root cause session with debriefing so that everyone has a chance to relate his or her own understanding to that of others participating in the group. This retrospective look at the answers can often change peoples’ minds.

Below, I discuss a means of using the Five Whys that has worked quite well with waste elimination teams. It is a bit more involved than the shorter example provided above.

USING THE FIVE WHYS

There are basically four steps to using the Five Whys:

- **Step 1.** Assemble a team and identify the problem, situation, or concept using hierarchical process maps. Because you ultimately need to eliminate all wastes from all processes, you should be sure to include non-product resource uses and losses and supporting processes. Using a rank-ordering tool as a guide, select a problem (opportunity) to work with. Define the problem associated with your choice, using the information known to the team. Decide whether you need others to help you understand the problem, or take the time to observe the problem and discuss it with the team.
- **Step 2.** Ask the first why of the team: “Why is such-and-such taking place?” You’ll probably end up with three or four plausible answers. Put them all on a flip chart or use index cards to place them on the wall with plenty of room around them.

- **Step 3.** Ask four more successive whys, repeating the process for every statement on the flip chart or wall. Post each answer near its “parent.” Follow up on all the answers that seem likely. You will have identified the root cause(s) when “why?” doesn’t yield any more useful information. Continue to ask why beyond the arbitrary five times if necessary to get at the root cause of the problem.
- **Step 4.** Among the dozen or so answers to the last-asked “whys,” look for systematic sources or causes for the problem under consideration. Circle those causes and discuss them with the team. See if you can limit it to a couple of root causes. Follow the session with a debriefing session. Show the work product to others and ask if they see the logic in the analysis.

For an example applying the Five Whys in a production context, see **Exhibit 3**.

BENEFITS OF THE FIVE WHYS

Once you have mastered the Five Whys technique and you have an experienced facilitator, the method becomes quick and easy to use. It is often referred to as a “short cut” to getting to the root cause of a problem. It is also a simple technique to learn since “why?” is such a common question used in daily life.

The Five Whys can help initiate a thinking process that will ultimately lead to solving the problem at hand. This method works quite well in a team setting. Using the Five Whys leads the team to a deeper understanding of the issue that they seek to confront. In this manner, the organization helps fight the “one right answer” syndrome.

Using the Five Whys can lead the team to the most important cause of the problem. In many cases, it will also help members of the team to challenge the group’s perception of a problem.

CHALLENGES IN USING THE FIVE WHYS

The Five Whys technique can also present some difficulties, as I discuss in this section.

One challenge is that, to work effectively and achieve optimal results with most problem-solving teams, strong facilitation assistance is generally required. It is very important to keep the team on target and avoid diversions. Organizations using the Five Whys on a regular basis train facilitators in-house and require all teams to use them when holding meetings.

Another challenge involves the nature of environmental issues. Waste can occur in many places, and there are many different causes that can lead to the problems associated with managing it. The Five Whys alone may not be able to sort these causes out. It may be necessary to use a cause-and-effect diagram to show how these causes are related and how they individually affect the problem that the team is confronting.

USING A COMBINATION OF ROOT CAUSE ANALYSIS TOOLS

If the problem selected is complex, the team may choose to put several root cause analysis tools to work for them. First, they can perform something called “Is, Is Not.” This will help the team better define the problem that has been selected by clarifying what it is and what it is not. Having this discussion often helps the team get warmed up for the Five Whys.

Next, the team follows the steps outlined above for the Five Whys. This will help the team pinpoint the source of the problem.

Third, the team can construct a cause-and-effect (or “fishbone”) diagram to illustrate the underlying causes and effects associated with the problem.

In an organization’s quest for zero waste, the key is to look at why a particular process is wasteful. The team

Exhibit 3. Five Whys: A Production Example

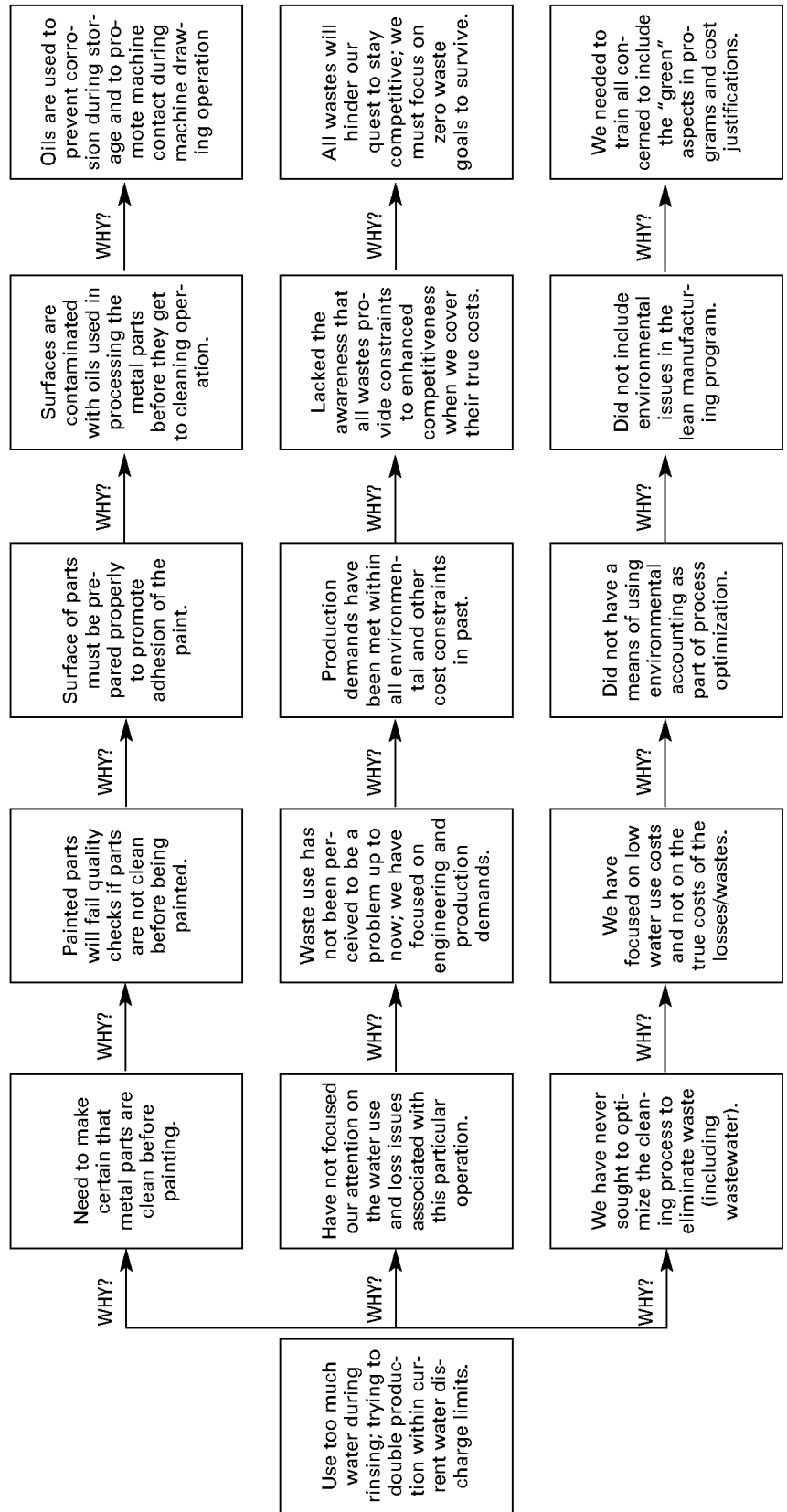
A problem-solving team was assembled to consider how to expand manufacturing production without increasing wastewater discharge. The public wastewater treatment facility was operating at hydraulic capacity and could not support additional wastewater. Prior to this root cause analysis session, the team had prepared process maps of the entire production process and had decided to focus on the rinsing operation.

In addressing the first "why?" question (on why so much water was being used), the team came up with three responses, as shown below. The facilitator then asked the team to develop all three paths. The fourth and fifth "whys?" were the most difficult on each path; they took some discussion on the part of the team in order to avoid the pitfalls discussed in this column.

The top path got the team to look "upstream" of the rinsing operation, focusing on the overall need to ensure that manufactured parts were clean before painting. Was there a way to avoid having to use so much water to clean and rinse? This pointed to a prevention alternative that could be addressed later in the problem-solving process.

The middle path looked to a much larger goal: achieving zero waste. Could there be opportunities to eliminate other wastes as the team focused on the particular problem at hand? This goal set a context for the team's thinking as they addressed the water use issue, and encouraged them to look at all points where water became waste in the rinses and elsewhere. A cause-and-effect diagram can often be useful at this point to look at the materials, machines, methods, and people involved in the process.

In the bottom path, the team reminded itself that the same lean manufacturing techniques that it used in optimizing production can be used to make the operation more "green" (i.e., have fewer environmental, health, and safety effects). They looked for opportunities to integrate environment into their lean manufacturing program for this and other operations. If the team had limited itself to one string of "five whys," the other trains of thought would not have been uncovered. You probably realize by now that there is rarely a single root cause in the complicated world of quality-environment-safety. However, identifying the most probable causes will go a long way toward finding acceptable alternatives to address the issues before the team.



must take a broad-stroke approach instead of focusing on the symptoms. It is important to avoid knee-jerk reactions that do not solve the problem. Identifying the root cause(s) is the key. You want to cure the root cause first and foremost, not the symptoms.

THE KEY TO UNDERSTANDING LIES IN "WHY"

Every organization should incorporate root cause analysis as part of its problem-solving process. To do this, your company will need to become familiar with both cause-and-effect dia-

grams and the Five Whys. Whether you deal with compliance issues or prevention programs, or both, your problem-solving team should never generate alternative solutions to problems without first completing root cause analysis.

You will recognize the results right away in the quality of alternatives proposed by your teams. "Employees never resist their own ideas," as the saying goes. Root cause analysis will help your employee teams move the entire organization along the path to environmental excellence. And to think that all this begins with the question "Why"!

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