



A seven-part series to improve your organization's problem-solving efforts

Part 1: Problem Solving Should be Like Treasure Hunting

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Team problem solving is a critical component in any organization's continuous improvement toolkit. Many problem-solving methodologies are available, and most organizations have adopted a particular approach. Employees are trained and the problem-solving processes are put to use, yet few organizations apply these processes to all their problems. Even more interesting is the fact that employees who participate in problem-solving teams often find the process arduous.

Given that problem solving is an extremely beneficial process, why isn't it more widely practiced and why do so many resist it? There are many answers to these questions, and this seven-part series of articles will explore some of these areas, as well as provide a review of the components of structured problem solving. In this first installment, we'll review the principles of structured problem solving, present a generic model for the problem-solving process, and offer an alternative model—treasure hunting.

Why Use Structured Problem Solving?

Structured problem solving is a systematic way to use facts and data to solve problems and maintain improvement gains. Effective problem solving prevents future occurrence of defects/issues, rather than trying to detect and remove or respond to them after they occur. It focuses on assuring that your processes are controlled to deliver quality products or services.

The fundamental approach that separates structured problem solving from other methods is root cause determination. The process assumes that if the implemented solutions do not address the true underlying cause, the problem will recur, wasting the resources that were invested in the original effort.

Structured problem solving has the following main purposes:

- Get to the root of the problem to solve it permanently.
- Enable you to understand and control the work process.
- Involve everyone in the quality improvement effort, harnessing the brainpower of everyone in the organization.

Fundamentals of Structured Problem Solving

Problem solving processes are an extension of the scientific method, an approach to acquiring knowledge that uses observations to develop a hypothesis and then empirically tests the hypothesis by making additional, systematic observations.¹

The scientific method involves five basic tasks, as described below:

- *Observation.* Informal observations lead to a question that warrants further investigation. Inductive reasoning, the process of using a small set of data as the basis for making a generalized inference, is the process used to formulate the research question.
- *Hypothesis development.* Tentative explanations for the observed phenomena are proposed. These hypotheses may be based on common sense, previous experience, or other scientists' theories. Hypotheses for all sensible explanations should be developed.
- *Prediction.* For each hypothesis, the scientist makes a logical prediction of how that hypothesis would be evidenced in the real world. This process involves deductive reasoning, the process of using a general statement to draw a conclusion about a specific situation.
- *Evaluation.* Data are collected to provide an impartial assessment of the hypothesis by testing whether or not the predictions are correct.
- *Comparison and repetition.* The experimental data are compared to the predictions. If they match within reasonable limits, based on statistical analyses, the hypothesis is supported. If the data do not align, the hypothesis is refuted. In the former case, additional research usually involves verifying the hypothesis under similar and dissimilar conditions; once a body of supporting research is established, the scientific community may accept the hypothesis. On the other hand, refutation may result in revision of the tested hypothesis or investigation or alternate hypotheses.

The scientific method is a balanced process. It combines the best of human intelligence and experience with rigorous research methodology. Observation and intuition set the stage, rational analysis provides a set of

tentative hypotheses, and empirical research supports or refutes those hypotheses.

The Deming Plan-Do-Check-Act Cycle, which serves as the foundation of most organizations' problem-solving process, is closely related to the scientific method.

Use of Teams

Although some problems are narrow enough in scope that an individual following the process steps can find the root cause and develop and implement a solution, the structured problem-solving approach generally relies on a team to solve problems and make decisions that are effective for the entire organization. The team approach to problem solving succeeds where individual approaches often fail because:

- No one person has all the information.
- No one person has all the skills.
- A team can put the pieces of a solution together better than any one person because it brings diverse points of view and experiences to the discussion.

The team problem-solving approach increases commitment and develops a sense of ownership in decisions. It develops and enhances the team-building approach and encourages active mental and physical participation. It stimulates the human urge to achieve and think constructively, and it encourages straightforward communication. Opposing points of view are generally reconciled in teams, leading to more collaborative solutions. Finally, the team approach to problem solving serves as an effective base for converting ideas into action because a team can divide the tasks among many hands.

Problem-Solving Process Steps

The sidebar, "Six-Step Problem-Solving Process," presents a model that encompasses the common components of most organizations' problem-solving methods. Each step includes several supporting activities that ensure its successful completion.

Structured problem solving is a fairly linear process that builds a body of facts and data that lead to a root cause. Once the true underlying cause of the problem is identified, a viable solution is developed—one that directly eliminates the root cause; is economically feasible; fits within the constraints of the process and its surrounding environment; and takes human factors, including competency and resistance to change, into account.

Six-Step Problem-Solving Process

1. Define the problem.

- Select a high-priority problem or opportunity.
- State the problem in terms of a gap between the current state and the desired future (expected) state.
- Show why the problem is important, using facts and data.

2. Gather data about the current state.

- List the three most likely potential causes.
- List the three primary factors affecting the results from each of those causes.
- Develop a sampling plan to use for data collection.
- Prepare check sheets for recording the data.
- Gather data and create a database of information about the problem.

3. Determine the root cause.

- Propose a root cause.
- Verify the root cause by experimentation.

4. Select the best solution.

- Develop a list of potential solutions.
- Evaluate each one for feasibility and difficulty of change.
- Test the most promising solution.
- Revise the solution based on the test results.

5. Develop an action plan and implement the solution.

- Develop a list of all specific activities associated with putting the solution in place.
- Establish measurements to ensure implementation activities are completed as intended.
- Assign a person to each task.
- Monitor progress and take appropriate corrective action.
- Document activities and results.
- Compare the implementation results to the original and desired states.
- Analyze reasons for success/partial success and take appropriate corrective action.

6. Establish reliable methods for maintaining the gain.

- Establish reliable methods to ensure compliance/conformance.
- Document any side effects or findings that other personnel/teams should address.

Within these linear steps, however, there may be many cycles of data gathering and analysis. Some of those cycles provide information that forms a pattern and leads the team to the root cause and an effective solution. Other cycles show the team what causes are not involved or what solutions won't work. When combined, these linear steps and the cycles within them create a trail that guides the team from the problem to a fully implemented preventive solution, indicating which path of the fork in the road to follow and which to ignore.

Issues With Structured Problem Solving

Although there are many reasons why individuals and organizations choose to attempt to solve problems without following a structured methodology, four of the most common ones are discussed below:

- *Too much time.* Once a problem is recognized, most people want it solved immediately. Structured problem solving, however, is a method that requires an investment of time—often more time than people want to put into the process.
- *Too boring.* Systematically gathering and analyzing data may be a sound approach, but people generally prefer to create fixes for the problem. Almost from the moment the problem is identified, team members begin to suggest solutions. It's rare to see them get as excited about developing a sampling plan, designing and carrying out an experiment, or conducting a statistical analysis.
- *Too busy.* Almost everyone is swamped at work these days. Squeezing in time to participate in problem-solving teams is almost impossible for many people. It's interesting to note, however, that much of this busyness is actually related to detection and rework—the very areas eliminated when problems are solved.
- *Too little recognition.* When people do agree to join a problem-solving team, they often make significant sacrifices during the process, including working overtime to keep up with regular duties and

bearing the brunt of resistant employees' reaction to the changes associated with the selected solutions. In many cases, these sacrifices go largely unnoticed. When team members are recognized, a coffee mug and a t-shirt typify the nature of that acknowledgment.

To be honest, most people would say that problem solving is "dry as dust" or a "necessary evil." Few people would list time spent on a problem-solving team among their most memorable or rewarding work experiences. And, fewer people would call problem-solving activities or many other work duties, exciting.

What pursuits do people find exciting? Before we answer that question, let's consider two synonyms for the word exciting: stimulating and thrilling. It might not seem reasonable to expect work to be thrilling, but we can hope it will be stimulating. This logic is also true for our hobbies and activities outside of the workplace.

Do you enjoy landscaping? Photography? Playing a round of golf on the weekends? Activities such as these are stimulating, rather than thrilling, under most circumstances. Typically, gambling or other mildly risky activities are as close to thrilling as people are likely to get.

Now shift away from these real-life pastimes and think about some of your fantasy careers. Would you like to be James Bond, super spy, or Miss Marple, super sleuth? Or drive a race car or be an astronaut? Most people certainly consider these thrilling career choices.

What if problem solving could include some of the attributes of these stimulating pastimes or imaginary careers? What if we could introduce aspects of the lives of Indiana Jones or Lara Croft

into the problem-solving process? It seems likely that we would see far more enthusiasm for participating in problem-solving activities if that were the case.

Noted children's author James M. Deem used the treasure-hunting theme in one of his books to entice youngsters to engage in reading, a task that many of

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them find as daunting as adults find problem solving. He introduces the book, *How to Hunt Buried Treasure*, by saying, “Do you want to strike it rich and find lots of treasure? It’s not as easy as it seems. Sometimes treasure hunters get lucky; sometimes they make mistakes. Occasionally, a clever treasure hunter will do some hard work and dig up a treasure that took years to track down.”²

Note the similarities between treasure hunting and problem solving:

- It’s hard work.
- It can take a long time.
- Mistakes are likely along the way.

Most of us would jump at the chance to search for buried treasure if we had a few promising leads to start us down the trail and the prospects of getting rich at the end. Let’s look at some ways that problem solving can be made more like a treasure hunt.

Treasure-Hunting Tips and Problem Solving

Thuels Treasure Bookstore provides the following tips in its report, “How to Succeed at Treasure Hunting:”³

- *Believe in treasure.* “The path to success as a treasure hunter begins with the belief that there is indeed treasure to be found... If you don’t believe the preceding statement, then this may not be the pursuit for you,” states the report.

Seems obvious, doesn’t it? Who would invest the effort of planning for and conducting a treasure hunt if he/she didn’t believe there was a treasure? On the other hand, it seems unreasonable to expect assigned team members to believe that solving the problem will be as rewarding as finding a treasure. Even people who volunteer to participate are more likely to do so in an effort to avoid annoying work processes or unsatisfactory results, rather than for the joy of finding a solution.

- *Set a goal.* “To succeed as a treasure hunter, you must first define the level of success you wish to attain. Does success to you mean finding coins or bullion totaling a half-million dollars? Or will you feel satisfied if each year you find enough to augment your regular income by 20%? Think about this carefully because the level of success you wish to achieve will ultimately determine the amount of time, energy, and money you invest in the venture.”

How big is the problem? How much will the organization benefit from solving it? Team members will be more enthusiastic about the process if the time and energy they invest balances against the results achieved.

- *Develop a treasure attitude.* “Having the right treasure attitude encompasses a whole host of traits that are crucial to your success.” The report authors mention two traits in particular: belief in yourself and that you will succeed and being aware of the treasure possibilities around you. The first trait involves visualizing success, and the second involves being alert to leads, regardless of their source.

Real-life experiences have taught many team members that solving one problem doesn’t necessarily make work go more smoothly. Several factors create this situation, such as the tendency for problem-solving efforts not to identify and eliminate root causes, which causes the problem to recur. Visualizing success is challenging when past experiences don’t feel like successes.

Staying alert to leads sounds like a simple assignment, but many team members begin the problem-solving process with preconceived notions. When presented with additional information, they fail to notice it or immediately reject it, because the new facts and data don’t align with their inbound premises.

- *Educate yourself for success.* “You must have a willingness to educate yourself for the business of treasure hunting. The best part of this, however, is that you only have to learn those things that are important to your success. Learning anything is always easier if you have a reason to learn.”

All too often members of problem-solving teams are forced to endure a long, upfront training process that not only covers the steps in the process but also presents a plethora of data collection and analysis tools that might be used. The adage, “Use it or lose it,” certainly makes this practice questionable. The frustration many team members express about the time it takes to go through the training and get to actual problem solving makes an even more compelling argument against this approach.

- *Operate on a business-like basis.* The report states, “One of the best ways to insure success in treasure hunting is to treat it like a business. As in every

business endeavor, preparation, persistence, and patience may be required. Perhaps you delight in the fantasy of ‘lucking out’ and finding a treasure on your first attempt. More than likely, however, success will only come after long and diligent research coupled with persistent field work.”

The author equates preparation, persistence, and patience with business, but these three attributes are often lacking when team members describe their problem-solving experiences.

- *Specialize for success.* “Serious treasure hunters agree that specialization is important because it allows you time to do the type of focused in-depth research most likely to uncover productive leads. Also, if your time is limited, specialization will allow the greatest return for time invested. Specialization allows you to concentrate on those types of sites that most interest you, usually resulting in greater recoveries because you will do a better job.”

How much more energy and enthusiasm can we expect from team members whose interests naturally align with the problem area? How much easier would it be for them to gather and analyze the necessary data? How much more likely would they be to spot patterns and understand the repercussions of planned changes?

- *Follow through.* “Follow through is the logical culmination of your treasure hunting efforts. This is the stage of the hunt that adds legitimacy to the entire treasure seeking process. It’s what separates treasure hunters from fiction writers. To research a lead, verify it, and then not follow through is a waste of your precious time and effort.”

One of the saddest issues with problem-solving teams involves their failure to implement their solutions in a way that ensures permanent process changes. In some cases, this occurs because team members have more energy for devising solutions than for implementing reliable methods to maintain those solutions. In other cases, poor change management skills undermine successful implementation.

- *Enjoy the trip.* “With all the emphasis mentioned earlier on goal setting and putting treasure hunting on a business-like basis, it is easy to forget that treasure hunting is supposed to be fun.”

If team members have to wait until they’ve implemented a solution completely before feeling good about their efforts, they’re unlikely to maintain a positive attitude throughout the problem-solving process. Why shouldn’t data collection and analysis be fun and fulfilling? Why shouldn’t leading change be a worthwhile and rewarding endeavor?

Coming up in Future Issues

In this article the principles of problem solving and a problem-solving process were presented. Additionally, key issues that undermine individuals’ and organizations’ application of those principles and process were discussed, and an alternative framework presented—treasure hunting—for revising the problem-solving process to make it more effective.

The remainder of this series of articles will review the six problem-solving steps and will suggest ways that treasure-hunting techniques and other nonconventional wisdom can improve problem-solving efforts.

References

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