A Quick Guide to Problem Solving
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A Quick Guide to Problem Solving

Introduced by Mind Tools CEO, James Manktelow

In business, it's essential to be able to solve problems effectively.

Fortunately, there are many powerful tools that you can use to look at a problem, determine the nature of the situation you're dealing with, find possible solutions, and then evaluate those solutions, so that you can select and implement the best one.

But this wealth of tools and techniques creates a problem in itself: which tools should you use on which occasion? And how do you pinpoint the most useful tools for the problem you're facing?

This e-booklet helps you address these issues. We take you through a simple but flexible problem-solving process. As we go, we point you toward useful tools that will help you deal with many of the different types of situation that you may encounter.

With these tools, you'll be able to start tackling problems more effectively – and with increased confidence that you can overcome the problems that you face.

I hope you enjoy this guide!

James Manktelow, CEO, MindTools.com
A Problem Solving Process

Problems, problems, problems. Day in and day out, we’re surrounded by them, and solving them is an essential workplace survival skill.

It’s good to know that there are many powerful problem-solving tools that can help – in determining the nature of the issue you’re dealing with, in generating good options, in analyzing risks and impacts, and, finally, in selecting the best solution.

However, the sheer number and range of problem-solving tools creates its own problem: How do you identify the right tools for your situation? While it would be great to have a “one size fits all” problem-solving method, the fact is that most problem solving requires flexibility, and the ability to choose the right tools for the job.

This guide to problem solving is designed with exactly that in mind. It helps you learn the key steps of problem solving, and it teaches you some of the most useful tools and approaches. Read on to discover more about some of the most popular tools for problem solving, how to apply them with flexibility, and how to use them to good effect!

Five Key Steps

Most approaches to problem solving boil down to five steps:

1. Defining the problem.
2. Understanding the problem environment.
3. Generating alternative solutions.
5. Selecting the best solution.

In this guide, we look at each of these steps, and what it involves. Then we discuss some of the tools available to help you, and look at when you should consider using them.

Tip

You don’t always have to follow these steps in sequence. For example, sometimes there’s an intuitively obvious solution. Here, all you really need to do is understand the risks involved, so that you can decide whether those risks are acceptable.

At other times, you may prefer to start at Step 4 – generating alternative solutions – and then go back to Steps 1-3 to check that they’re valid, before finishing off with Steps 5 and 6.

The key is to be flexible, and adopt the approach that best suits the situation.
Step 1: Defining the Problem

You first need to check whether it’s worth spending time to solve this problem. Is the problem significant and strategic? Will solving it add value to you, your organization, or your customers? And if it should be solved, is it your responsibility to do so? If not, consider leaving the problem unsolved – or pass it on to the person whose responsibility it is to deliver a solution.

If you decide to go ahead, then it’s often worth investing some time and effort in fully understanding the problem. This is particularly the case when you’re dealing with problems that will take several months to solve. In this situation, it’s worthwhile to determine before you start that you’re solving the true problem – rather than just treating the symptoms of a deeper, underlying issue.

To do this, consider using the Five Whys technique, Cause and Effect Analysis, or CATWOE. Of these three tools, Five Whys is the simplest and is ideal for smaller problems. It can, however, lead you down a single path where you ignore other options. Cause and Effect Analysis and CATWOE help you more possible causes of the problem, so they’re best for larger problems, and for those with a greater potential impact.

If you’re dealing with a large problem, you can make it more manageable by using Drill Down to break it into parts. You can then tackle each part separately.

Browse the toolbox below to find out more about these tools.

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Step 1 Toolbox

Five Whys
This simple but effective tool prompts you to ask “why” the problem exists. After that, you keep on asking “why?” to those answers until you uncover the real root cause of the problem. More >>

Cause and Effect Analysis
This technique involves drawing a fishbone-like diagram that helps you brainstorm the possible underlying causes of your problem. This pushes you to think about many more of the possible causes of your problem than you might naturally consider. More >>

CATWOE
CATWOE helps you look at the situation from a number of different points of view – from customer perspectives to environmental constraints – so that you can make sure that you’re solving the right problem, and not just a symptom of a larger problem. More >> (Members only)

Drill Down
This helps you break down a large and complex problem into its component parts. By doing so, you can develop plans that deal with each of these parts. Drill down also helps you identify where you need to conduct more detailed research. More >>
Step 2: Understanding the Problem Environment

Sometimes people take this step, the environmental analysis, intuitively. For smaller problems, you may not need to go through any elaborate investigation to understand your current situation. If, however, you want to make significant changes, or if you need to have a strong grasp of the big picture before moving ahead, then this step is essential.

Perhaps the most useful tool for understanding your environment is a **SWOT Analysis**. Used on a personal, organizational, or competitive basis, this tool helps you identify the strengths, weaknesses, opportunities, and threats that are related to the problem at hand. By using this technique, you can think about these questions:

- What strengths and opportunities can you build upon to come up with a solution?
- What weaknesses and threats do you need to keep in mind when you evaluate and eventually choose a solution?

Depending on the situation, other useful techniques include [Porter’s Five Forces](#), [PEST Analysis](#), and [Value Chain Analysis](#).

If your problem involves issues with a process, you can often identify where problems lie by mapping that process with [Flow Charts](#) or [Swim Lane Diagrams](#).

Browse the toolbox on the next page to find out more about these tools.
Step 2 Toolbox

**SWOT Analysis**
SWOT Analysis is a simple but powerful framework for analyzing your Strengths and Weaknesses, as well as the Opportunities and Threats that you face in your specific situation. This helps you focus on your strengths, minimize threats, and take the greatest possible advantage of the opportunities that are available to you. More >>

**Porter’s Five Forces**
This simple but powerful tool allows you to see where power lies in a business situation. This is often fundamental to understanding what you can expect from other people and organizations. Five Forces Analysis is based on an analysis of supplier power, customer power, threat of substitution, ease of new entry, and competitive rivalry. This tool is particularly useful because it helps you understand both the strengths and weaknesses of your current competitive position, as well as those of a strategic position you’re looking to move into. More >>

**PEST Analysis**
PEST Analysis is a simple but important – and widely used – tool that helps you understand the big picture of the Political, Economic, Sociocultural, and Technological environment in which you’re operating. PEST is used by business leaders worldwide to build their vision of the future. It can help you understand some of the fundamental forces that could lie behind the problem you’re experiencing. More >>

**Value Chain Analysis**
This helps you think about where you add value for your customers within your business process. This way, you can start to identify whether there are issues at any of these points. It can also help you spot situations where you’re failing to deliver what your customer wants and expects. More >>

**Flow Charts**
Flow charts are easy-to-understand diagrams that show how steps in a process fit together. They help you recognize and clarify the details of how things currently work. This allows people to understand and discuss processes, and identify any flaws within them. More >>

**Swim Lane Diagrams**
These diagrams take flow charts a step further by allowing you to map interactions in processes between departments and teams. Many problems are caused by confusion and failure at the point of handover between different groups of people. You can easily identify these possible points of failure with Swim Lane Diagrams. More >> (Members only)
Step 3: Generating Alternative Solutions

After you've understood the context of the problem, it's time to actually start generating potential solutions. Too often, however, this is the stage of the problem-solving process at which people first jump in (in fact, people often just pick the first solution they can think of.) However, if you bypass earlier steps of analysis, you risk developing solutions that only disguise the problem – or you may create an even greater problem down the road. This can be a key failure if the problem is a major one, or if developing the initial, incorrect solution takes a long time.

When you are ready to come up with solutions, there are several tools you can use to kick-start your creative processes.

**Brainstorming** is a popular – and effective – way to generate solutions to a problem. Use it when you have a team of people who want to look at a problem with fresh eyes and open minds. (If your group brainstorming sessions are dominated by loud or egotistical individuals, then this will reduce their effectiveness. Here, consider using the **Crawford’s Slip** approach instead.)

An extension of this approach is **Reverse Brainstorming**. With this technique, you don’t ask how to solve the problem, you ask how you could cause the problem – and then you brainstorm ways of making the situation worse.

From there, you change the “cause” to a “solution” by adding “Don’t” to the beginning of each suggestion – and you develop ideas from these statements.

If your solution involves a physical product or design, try **SCAMPER** or **TRIZ**. SCAMPER can encourage lateral thinking that stimulates fresh perspectives. TRIZ can help you generate a comprehensive list of solutions by drawing on rigorously analyzed past solutions to generalized problems. While TRIZ is normally only used to solve engineering problems, its comprehensive approach makes it particularly powerful in this context.

Once you’ve generated a set of ideas and potential solutions, you need to start organizing these – many ideas are likely to be different versions of the same basic concept. Use an **Affinity Diagram** to help you group the ideas you developed and show you how to create relationships between ideas. By doing this, you may also gain further insight into the problem, and you may discover hidden linkages. This can lead to some great new alternatives that you would not have otherwise seen.

If your problem is a complex one, it’s worth exploring the most promising options in more depth at this point. The **Straw Man Approach** is useful for just this.

And for problems that are particularly complex and important, and need expert input from many people, consider using techniques like the **Charette Procedure** (for brainstorming in large groups) and the **Delphi Method** (for generating and critiquing options in detail).

**Tip**

This is a good point to bring in your findings from any SWOT Analysis that you carried out during Step 2. Make sure you think about how you can use your strengths to solve the problem.
Step 3 Toolbox

Brainstorming
Brainstorming is a popular tool that you can use to develop highly creative solutions to a problem. It’s particularly useful when you need to break out of stale, established patterns of thinking in order to develop new ways of looking at things. More >>

Crawford’s Slip Writing Method
The Crawford’s Slip Method is useful when you need creative input from all of the members of your team, but where your group process is dysfunctional, or is dominated by one or two loud individuals. More >> (Members only)

Reverse Brainstorming
This turns around the usual approach. Instead of asking how to “solve” the problem, ask how to “cause” the problem. If you haven't used this approach before, you'll be surprised by the useful perspectives that you come up with as a result. More >>

SCAMPER
This tool prompts you to develop a solution by considering Substituting, Combining, Adapting, Modifying, Putting to another use, Eliminating, or Reversing elements of the existing situation. More >>

TRIZ
TRIZ draws on the study of more than 3 million patents to provide a systematic, database-driven, and comprehensive set of solutions to generic problems. By linking your problem to a TRIZ-standard problem, you can find TRIZ-standard solutions. You can then develop these into specific solutions to your problems. More >>

Affinity Diagrams
Use this method to organize proposals into common themes. You can then evaluate the proposals more easily and uncover new connections between ideas and solutions. More >>

Straw Man Concept
A “straw man” is a starting-point proposal that’s intended to be tested, scrutinized, deconstructed – and, maybe, thrown away. Using a straw man can be an effective intermediate step toward coming up with a strong solution or plan. More >>

The Charette Procedure
Normal brainstorming becomes increasingly ineffective with more that 10 people. So what if you need to gather ideas from many more people than this? This is where the Charette procedure becomes useful. More >>

The Delphi Technique
The Delphi Technique is a very formal problem solving process that involves rigorous independent analysis of a problem by a panel of experts through several iterations. This is a time-consuming, combative approach that can, nevertheless, provide very good results. More >> (Members only)
Step 4: Analyzing Risks, Assumptions, and Impacts

So, you now have a set of potential solutions to your well-defined problem. Before you take the final step and choose one, you need to test your ideas to make sure that they're sound. This involves understanding the risks involved in each alternative, checking that the assumptions behind them are sound, and projecting the likely outcomes of the change to make sure that there are no serious negative consequences.

Another useful tool is Failure Mode and Effects Analysis, or FMEA, which helps you look at the possible points of failure in your solution, while the Ladder of Inference technique helps you check the logic structure of your argument, and test the assumptions you've made to reach your conclusions.

Finally, Impact Analysis helps you uncover the unexpected effects that changes might have on your organization and the people involved. This helps you avoid that dreadful, career-limiting situation in which the changes that you champion make the situation worse, rather than better.

The most important tool you need to use here is Risk Analysis, which helps you spot risks that your solution may face.

Step 4 Toolbox

Risk Analysis
The basis of risk analysis is that risk = probability of event x cost of event. With this tool, you first identify the potential risks of your solution. Then you estimate the probability of these risks occurring and the cost if they do occur. Finally, you determine how you would manage the risks. Through this process, you'll understand which risks are worth taking and which ones are not, and from this, whether the option is worth exploring in more detail.

More>>

Failure Mode and Effects Analysis (FMEA)  
This helps you systematically identify all the points at which a solution could fail. By looking at a solution from this negative perspective, you can develop a solution that is robust enough to succeed. The questions you answer with an FMEA analysis are: How severe might the failure be? How likely is the failure to occur? How easy will it be to detect the failure?

More >> (Members only)

The Ladder of Inference  
The Ladder of Inference provides a structured approach for (1) checking whether your assumptions are correct and (2) ensuring that you've based your proposed solution on correct logic and well-gathered data. This makes it useful for auditing a proposed solution to make sure the solution is sound.

More >> (Members only)

Impact Analysis  
Impact analysis is a structured method for looking in detail at the possible positive and negative consequences of a solution – and helping you ensure that the change would indeed be a positive one. This analysis helps you spot in advance the “unexpected consequences” of a decision that can cause so much pain.

More >> (Members only)
Step 5: Selecting the Best Solution

This is where all of your preparatory work sees a payoff. At this point, you’re confident that the solutions you’re evaluating are appropriate, that they’ll solve the real problem, and that they’re consistent with the strategic direction of the company.

But can you afford all of them? And which solution offers the greatest benefit? For small or medium-sized decisions, use Cash Flow Forecasting to assess the viability of the project, and then carry out a Project Evaluation or Decision Tree Analysis to help you decide which solution provides the best financial return. (For more complex or larger decisions, you may want to get the help of your finance department or your accountant to ensure that the analysis is comprehensive and correctly structured.)

The amount of time you invest in this will depend on how important the decision is. For high-impact decisions, you may also want to use Six Thinking Hats to ensure that you’ve considered all points of view in a balanced way. Typically, there are a number of factors that need to be taken into account when you’re choosing between several alternatives: cost, impact, timing, and so on. Paired Comparison Analysis is a powerful tool for assessing the relative importance of each and helping you identify the best solution. This is particularly powerful when used in conjunction with Grid Analysis, which helps you choose between options when you need to take many different considerations into account.

With all of those preliminary concerns addressed, it’s now a much simpler matter of evaluating the merits of each solution and choosing the best one. However, who should be involved in the decision? The Vroom-Yetto-Jago Decision Model gives you a useful (if slightly theoretical) guide for deciding whether you should choose a solution yourself or involve others.

If you need the input of many other people, then techniques like Multi-Voting and Nominal Group Technique can help you make sure that everyone feels they’ve had fair input into the final decision.

Step 5 Toolbox

Cash Flow Forecasting
This helps you test the financial viability of your proposed solution. More >>

Cost/Benefit Analysis
This allows you to compare the cost and benefits of a potential solution so that you can decide whether the improvements are worth the time and money they would require. More >>

Project Evaluation
Many commercial decisions are made on the basis of Net Present Value and Internal Rate of Return calculations. Learn how to use these approaches here. More >> (Members only)

Decision Tree Analysis
Decision trees provide a highly effective structure within which you can lay out options and investigate the possible outcomes of choosing those options. They also help you form a balanced picture of the risks and rewards associated with each option. More >>

Paired Comparison Analysis
This technique helps you rank several different factors in order of importance. It’s particularly useful where criteria are unclear, or where the judgment is subjective. More >>

Continued >>
Step 5 Toolbox (continued)

Grid Analysis
Grid Analysis helps you decide systematically between several options, especially when you have to take many different factors into account. More >>

Vroom-Yetton-Jago Decision Model
Use this model to assess which decision-making process is most appropriate for your situation. More >> (Members only)

Six Thinking Hats
This powerful technique can be used to look at decisions from a number of important perspectives. It guides you to move outside of your habitual thinking style, and it helps you gain a more well-rounded and balanced view of a situation. More >>

Multi-Voting
Conventional voting works fine when many people have to choose between a few options. However, it fails when they have to choose between many options. This is where a technique like Multi-Voting is useful. More >> (Members only)

Nominal Group Technique
Like Multi-Voting, Nominal Group Technique helps many people choose between many options. Multi-Voting is easier to understand, but is time-consuming. Nominal Group Technique is more efficient, however more trust needs to be put in the people managing the process. More >> (Members only)
Conclusion

Successful problem solving is a process (albeit an intuitive one for very simple problems). The five-step problem-solving process described here is a useful starting point for most problems, and it’s one that you can adapt to your circumstances.

We’ve highlighted many different problem-solving tools within this guide. Each is powerful in its own way and when applied to a particular type of situation – so it’s well worth exploring them and learning to use them. By honing these skills and learning these processes, you’ll have good tools at your fingertips for many of the situations you face. What’s more, with these tools as a starting point, you’ll be confident in developing new ones where you need them.
Have you found this e-book useful?

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James Manktelow, CEO, MindTools.com