UNIT 2 The Problem Solving Model

Learning Outcomes

By the end of this unit the learner will be able to:

- ✓ Analyze information to clearly describe problems
- ✓ Identify appropriate solutions

Unit 2

The Problem Solving Model

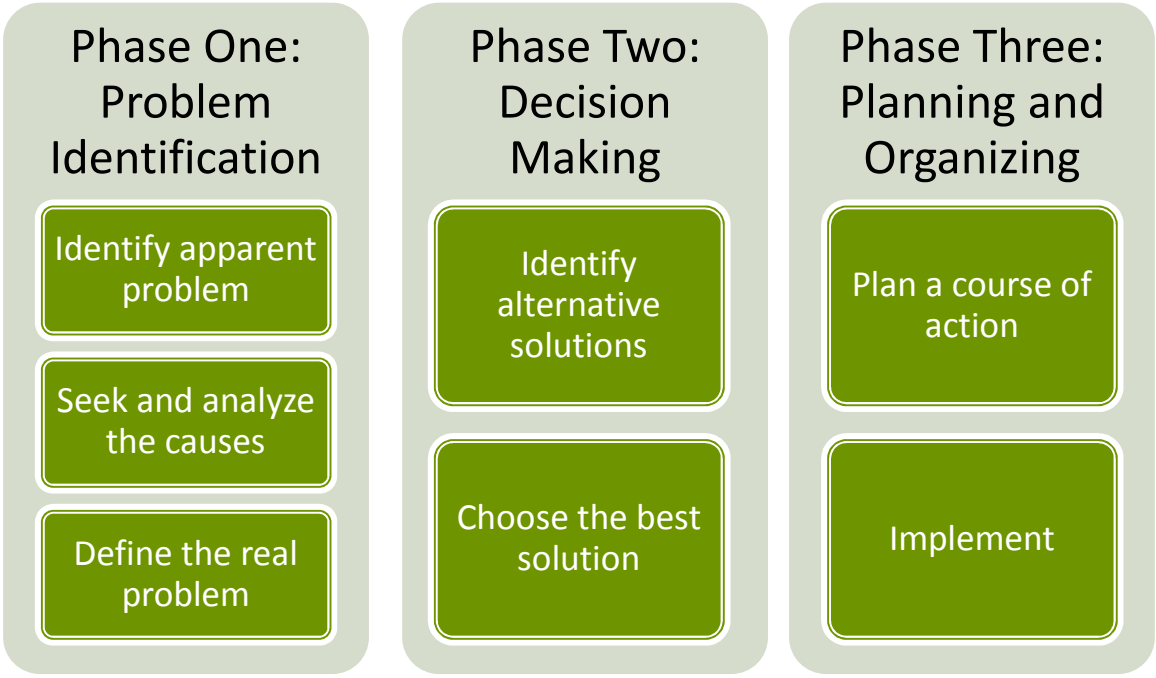
Model Overview

Whenever you read a book on problem solving, this model, in some form or other, is sure to be there. It may have six steps rather than seven, or it may have five steps. However, the model doesn't really change...just the authors' ways of breaking it down.

As you work your way from problem to solution, you are actually shifting your focus.

- When you define a problem, you ask yourself: What is my problem?
- As you try to analyze the root causes you ask: Why is it a problem?
- When you are generating options, you ask yourself: What are some ways I can solve my problem?

The Problem Solving Model

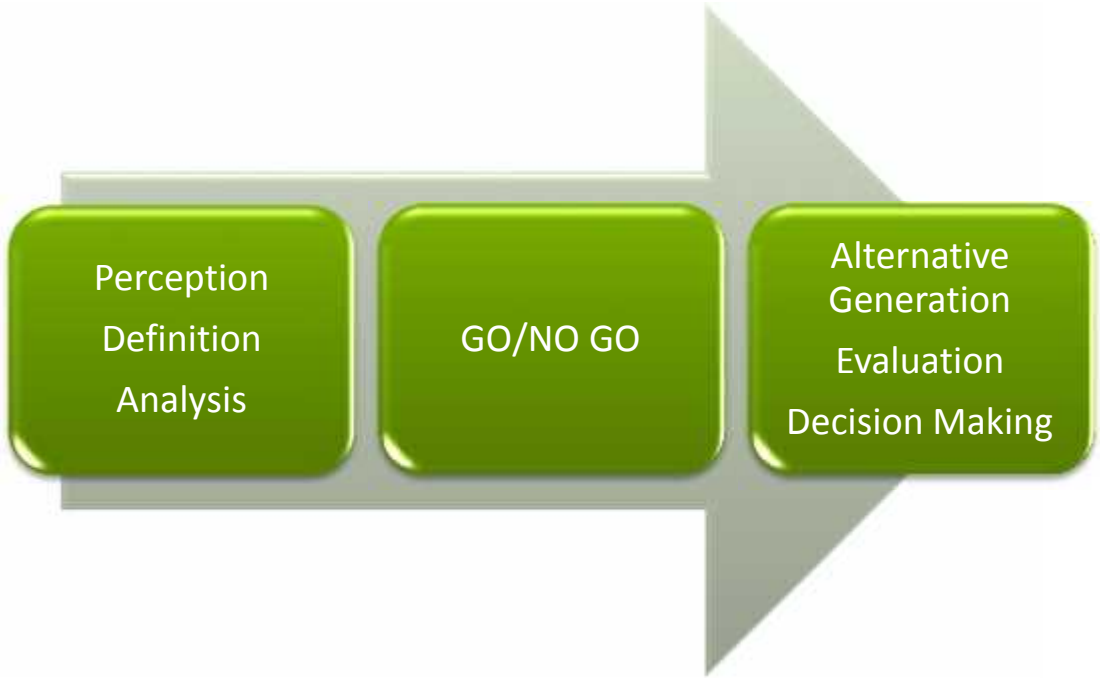


This model doesn't just work on paper: it applies across a range of problem solving activities. It is the very basis for informed and consistent problem-solving. If you are someone who loves tools, this is your basic tool.

We often don't spend enough time in defining a problem, and that in itself is a problem. Don't be in too big a rush to get the solution worked out: make sure you know what you need to know. Then, make a commitment to continually check back with the first stage to make sure the problem is the same.

Another Perspective

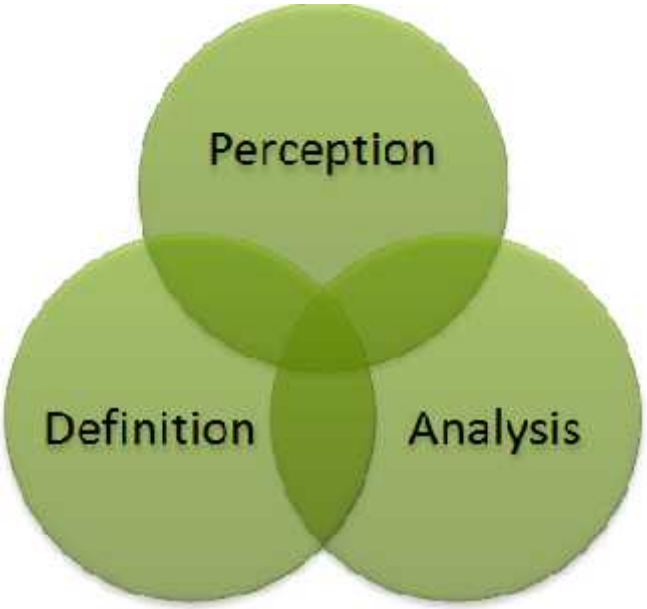
Here is another way of breaking down the three phases:



We recommend that you spend most of your time on the first block: perception, definition, and analysis. As we've mentioned already in this course, we often don't spend enough time in defining a problem, and that in itself is a problem. Don't be in too big a rush to get the solution worked out: make sure you know what you need to know first. Then, make a commitment to continually check back with the first stage to make sure the problem is the same.

Keeping an Open Mind

Part of the problem solving process is re-evaluating and evolving. This will ensure you reach the best solution possible. Consider how perception, definition, and analysis overlap:



Solving Problems the "Right" Way

Don't let people try to convince you there is one "right" or "best" way to solve problems, or to solve a particular problem. Problem-solving is all about applying educated trial and error. With so many different kinds of problems to deal with, there is no system that works in every situation. Many solutions are possible, and some are better than others.

Your skill as a problem-solver depends on your expertise with the tools and your knowledge of how to use them. You know you don't always solve problems step by step. Sometimes you have a solution before you know what problem it solves. For example, you decide to move your bed against another wall and you find out the next morning that the sun doesn't wake you up so early.

However, for many situations, having formal steps to follow can help you create flexible, workable solutions.

Real Problems

Case Study

You work in a regional insurance company with 300 employees. As a mid-level manager, you deal with a range of problems on a regular basis. Your team makes claim adjustments and answers complaints and inquiries about personal claims. Your job includes handling escalated calls, making sure that your team of 40 people stays within budget, and making sure that customers are satisfied.

Two weeks ago, you finished off the last of the performance reviews for the team. Since the work the team does is detailed, there are many aspects that are measured, so it is pretty easy to measure people's work. Two years ago there was a lot of turnover on the team, but since you became manager, only two people have left and been replaced.

The performance reviews are one of the measures that are used when it comes to giving raises. You have your spreadsheets at the ready to decide who gets how much.

You have 30 staff who are meeting expectations to varying degrees, six staff who are exceeding expectations (two of them are at the top of their salary band), and two who are just barely meeting expectations. You also have two vacant positions which you are currently trying to fill.

Your director has provided you with the budget figures for raises this year. Everyone will get a 1% cost of living increase, and you have to share the rest of the money among the group. Their base salary is between $30,000 and $38,000 per year. You know that 1% does not go far: your own rent has gone up 0.5%, gas is up 15% over last year, utilities are up about 10%, and groceries are more expensive than ever. What will you do?

If you give everyone a 2% raise (including their 1% cost of living), you will meet your budget, but your top people will go unrewarded by any additional amount, despite getting better results than their colleagues. There is not enough money available to give each person a 3% or 4% raise. You are not allowed to go over budget. Clearly, you have some math to do and decisions to make.

Discussion Questions

What is the problem (or problems)?

Is this your problem or someone else's?

Do you have all the information you need to make a decision?

Phase One

Let's take a look at the first phase of the three-phase model: Problem Identification. Here is a breakdown of each step in the problem identification process. In all three steps, your focus is on the problem itself. Only afterward will you start thinking about solutions.

Perception

You ask yourself: Is there a problem? Where is the problem? Whose problem is it? This is the sniffing, groping, grasping stage. It includes whatever you do to get a handle on the problem.

What are the symptoms? Funny noises in the engine, an unhappy look on your employee's face, or a change in the productivity rate? You've got to find out what the problem is.

The purpose of this phase is:

- To surface an issue.
- To make it okay to discuss it (legitimize).
- To air different points of view.
- To avoid perception wars.
- To get group agreement to work on the problem.

Steps in this phase include:

- Legitimizing the problem; make it okay to discuss it.
- Asking, "How does the problem feel?" and, "What's the real problem?"
- Identifying the best, worst, and most probable situation.
- Identifying whose problem it is.

Definition

Here, we state the problem as a question. Our goal is to grasp the general idea of the problem and then draw the rope tighter to get a more specific idea of the problem.

Steps in this phase include identifying:

- What is the problem?
- What is not the problem?

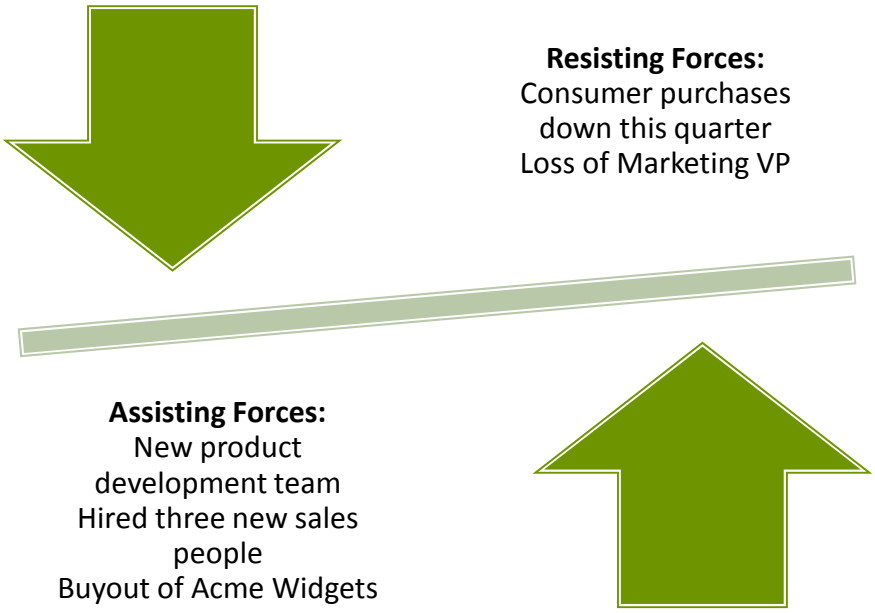
Analysis

Now that we have a general idea of the problem, we will use analytical tools to define it even further. Steps in this phase can include the following.

Ask basic questions, such as who, what, where, when, why, and how.

Break it down into smaller pieces. For example, if we know that the problem is that revenue is down, we can break it down into possible areas of cause: manufacturing, shipping, or sales.

Use force field analysis. This is a structured method of looking at two opposing forces acting on a situation. Simply draw a line on a piece of paper. On one half of the line, list the forces that are working to solve the problem. On the other half, list the forces that are stopping you from solving the problem. Let's say that revenue is down this quarter. Our force field might look like this:



Move from **generalizations to specific examples** as a way of testing what the problem is or is not. For example, you could say, "Our company has really been doing poorly all year." We could further identify how the company has been doing poorly; let's say that the production department in particular has been less efficient, costing the company money. Then, we can look at what aspect in particular is doing poorly.

Ask the expert. Find a person who has dealt with this sort of issue before.

Phase Two

Until the three steps of problem identification have been covered, don't proceed to phase two (decision making). (If people don't agree on the problem, they will never agree on a solution!)

Creative Thinking Methods

Here are some tools you can use to come up with ideas.

Brainstorming
Draw a circle in the middle of a page and write down your problem. Then, draw lines from that circle and write down some solutions. Don't worry if they're wacky, impossible, or silly; this is a time for creative thinking, not critical thinking. Capturing the range of ideas is what is important here.

Checkerboard
This is a more organized form of brainstorming and can be particularly helpful for people who don't like how chaotic a brainstorming session can become. With this method, you organize your thoughts into a table. We still want creative thinking rather than critical thinking, but this method may help you develop ideas.

Here is an example of a checkerboard.

Main Solution	Possible Specific Solutions		
Create safe passage between building and parking/bus stop	Have security escort night staff to their cars or bus stop	Rearrange shifts so that people come and go during daylight hours	Set up a buddy system with employees
People missing work in snowstorm	Set up 50% of staff with ability to work from home during storms	Arrange for temporary shelters so that staff can stay overnight	Provide incentives for employees to put winter tires on their vehicles and learn safe winter driving
Threat of strike is rumored	Set up contract negotiations well before contract expires	Approach union and ask to speak with them	Set up contingency plan to ensure business continuity in the event of a strike

Next, cut up solutions and move them around, or use your computer. This can help you organize your ideas and generate even more solutions!

Research and Report
Look at what others have done. Do some research and prepare a report. What lessons can you learn from this information?

Evaluation

Now that we have some solutions in mind, it's time to evaluate the solutions to see which ones are feasible.

- Sort solutions by category. This can be similar to the checkerboard above, just with some critical thinking applied.
- Identify the advantages and disadvantages to each solution.
- Identify what you like about each idea and what you don't like.
- Number your ideas in order, from the one that seems the most feasible to the one that seems the least feasible. This is useful for small problems.

Decision Making

Once you have evaluated the options, it's time to make a decision. Here are some ways you can do it:

- Get a consensus from the group on the best solution.
- Don't limit yourself to one option; you may find that you can combine solutions for super success. (This is called the both/and method.)
- To make voting easier, you may want to eliminate the solutions that the group as a whole absolutely won't consider.
- Try to focus on agreements during all voting.
- Use straw voting: Take a quick, non-binding yes/no vote on the current solution as proposed.
- Try negative voting: Rather than asking who is for a solution, ask who is against the proposed solution.
- Back off! The group may need some time to evaluate the options before making a decision.

Phase Three

Our last phase should be planning how to implement the solution and performing the actual implementation.

Planning

For the planning portion, start by breaking the task down into smaller portions. Then, for each mini-task, plan the following information:

- What needs to be done?
- Who will do it?
- What resources will we need?
- How much time will it take? (Set a deadline!)

Once all the smaller tasks are planned out, you will have an idea of how long the main solution will take to implement. You may also want to make sure that the above questions are answered for the main task.

Implementation

Implementation is a cycle of three activities:

- Figuring out what you are going to do
- Doing it
- Reacting to what happened or getting feedback

Sooner or later, you have to try out your solution!

Solution Planning Worksheet

It can help to lay out what you are planning to do. Here is an example of a solution planning worksheet.

Problem: Revenue down 10%

Solution: Develop new product

Task 1	**Engineering will design product.**	
	What needs to be done?	Product needs to be designed.
	Who will do it?	Jim and Sue from Engineering.
	What resources will they need?	Unknown. They should have all resources in house; we will make sure they know we can assist in obtaining more resources if necessary.
	How much time will it take?	Targeted completion date: Dec. 31
Task 2	**Prototype will be created.**	
	What needs to be done?	Prototype needs to be developed.
	Who will do it?	Sam from Manufacturing, Jill from Engineering
	What resources will they need?	May need testing group; we will help provide this
	How much time will it take?	Targeted completion date: Feb. 28
Task 3	**Product will be manufactured.**	
	What needs to be done?	Product needs to be created.
	Who will do it?	Joe from Manufacturing
	What resources will they need?	All resources in-house
	How much time will it take?	Targeted completion date: Dec. 31

Case Study

Case Study

When Mike took out the company truck last week, he thought he heard an unusual sound, but the radio was loud enough to drown it out, so he didn't think about it again. The next day Alan took the truck out, but the radio was really loud from the time he started the truck, so he didn't notice anything.

Yesterday, Dave signed out the truck. Dave doesn't like the radio station that was playing, so he turned it off. He could hear something rattling underneath the truck. When he finished his errands, he told the fleet supervisor, Bruce, that there was a sound coming from underneath the truck."

"What did it sound like?" Bruce asked.

"A rattling sound underneath somewhere," Dave said, gathering a double tray of hot coffees for his friends in the office.

"Can you tell me anything else about it?" Bruce probed. "Rattling in the center, rear end? Metal on metal kind of sounds, or transmission?"

"No idea," Dave replied. "I'm not really a truck guy, y'know? If you start it up and drive around the yard a little, I'm sure you'll hear it."

Dave took the coffee and left the room, thinking that if Bruce would just do his damn job and maintain the fleet, he'd know what kind of rattle it was already.

Bruce knelt down to look underneath the truck looking for loose parts, thinking to himself, "These guys in the office have no idea how hard I work at maintaining these vehicles. They think it's a joke or something that they can hop into a truck and go get coffee without putting mileage on their own cars. They always come back with an armload of coffee, but they never offer to pick one up for me."

Bruce couldn't see anything hanging down below the truck, but he needed to finish putting the winter tires on the car that was already on the hoist. The truck would have to wait.

An hour later, Bruce came back to look at the truck but it was gone. He went into the office and asked around for who had taken the truck. No one knew, and so then he asked who wasn't at their cubicles. Dave and Nick were missing. Bruce stormed into the boss' office, mad.

"Jessie," he said. "I'm getting to the end of my rope. Dave knew there was a problem with the truck, and yet he is out in it right now. These guys have no respect for those vehicles."
"Sorry Bruce, I think he went to get lunch for the guys. They are putting in a lot of hours to get this project done."

"Jessie, they all bring their own cars to work. There was no need for them to take that truck, except that they like joy riding around in it. I've spent 14 hours on maintenance in the last quarter. Dave told me today that there was a noise that needed looking at, and then he took the truck anyway!"

Then the phone rang. Seeing that it was Dave's cell phone, Jessie put it on speakerphone. "Jessie, it…it's Dave. I don't know what to do and I don't have Bruce's number. Me and Nick are in the truck and we've b...been in an accident. Nick's hurt bad. What do I do?"

Jessie looked at Bruce. "Open the glove box," Bruce said tersely. "All the emergency numbers are listed right there. Call for police and ambulance, and then call me back so I know where to meet you."

Discussion Questions

What is the problem?

What is its root cause or the real problem?

What is the Problem As Given (PAG)?

What is the Problem As Understood (PAU)?

How does it feel to Dave? How does it feel to Bruce?

What are the best/worst/most probable consequences of solving/not solving the issue?

Outcome	Best Consequence	Worst Consequence	Most Probable

Further Reading:

- ✓ *Browne, Neil M., and Stuart M. Kelley. Asking the Right Questions: A Guide to Critical Thinking (10th Edition). Longman, 2011.*
- ✓ *Davenport, Thomas, Brook Manville, and Laurence Prusak. Judgment Calls. Harvard Business Review Press, 2012.*