

Problem Solving Skills



with examples and
hands-on exercises

WEBUCATOR

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Class Files

Download the class files used in this manual at

<https://static.webucator.com/media/public/materials/classfiles/BUS101-1.0.1.zip>.

Errata

Corrections to errors in the manual can be found at

<https://www.webucator.com/books/errata/>.

Table of Contents

LESSON 1. Defining the Problem.....	1
Why This Is an Important First Step.....	1
Tools for Defining the Problem.....	1
📄 Exercise 1: Creating a Fishbone Diagram.....	7
LESSON 2. Generating Possible Solutions.....	9
Use a Mind Map.....	9
📄 Exercise 2: Creating a Mind Map.....	11
Brainstorming Techniques.....	12
📄 Exercise 3: Brainstorming.....	14
Shift Your Perspective.....	16
Challenge Assumptions: Restate the Issue.....	16
📄 Exercise 4: Checking Your Knowledge.....	18
LESSON 3. Evaluating and Selecting Alternatives.....	21
Determine the Most Workable and Reasonable Solution.....	21
📄 Exercise 5: Determining the Best Solution.....	23
Occam’s Razor: Why the Simplest Solution Is Usually the Best.....	24
📄 Exercise 6: Occam’s Razor in Practice.....	26
LESSON 4. Implementing Your Solution.....	41
Gain Acceptance from Stakeholders.....	29
📄 Exercise 7: Gaining Support.....	32
Define Resources Needed to Implement the Solution.....	34
📄 Exercise 8: Defining Resources.....	35
Implement a Contingency Plan.....	36
📄 Exercise 9: Implementing a Plan B.....	38
LESSON 5. Evaluating Your Solution.....	41
Follow Up to Ensure that the Problem Is Solved.....	41
📄 Exercise 10: Ensuring That the Problem Is Solved.....	43
Determine Lessons Learned, to Avoid Future Problems.....	44
📄 Exercise 11: Determining Lessons Learned.....	46
Suggest Improvements to the Solution.....	48
📄 Exercise 12: Suggesting Improvements.....	49

LESSON 1

Defining the Problem

Topics Covered

- Why defining the problem is an important step.
- Some tools you can use to help define your problem.

Introduction

It's likely that you face problems at work every day. They may be large in scale, small in scale, or somewhere in between, but they all have one thing in common: how you approach the task at hand and how you solve the issue can have a tremendous impact on your organization. The first step you should take, when faced with any problem, is to define the problem itself.

1.1. Why This Is an Important First Step

A famous quote attributed to Albert Einstein goes like this: "If I had only one hour to save the world, I would spend fifty-five minutes defining the problem, and only five minutes finding the solution."

What Einstein meant is that the quality of the solution to a problem is directly related to the quality of the definition of that problem. If you spend time working through this step instead of jumping straight into the work of generating possible solutions, you will likely find that the rest of the steps actually take less effort to complete than you had anticipated.

1.2. Tools for Defining the Problem

There are a number of tools you can use to begin your problem-solving journey. We will describe the following methods:

1. Root-cause analysis

2. Diagramming
3. The Six Ws
4. CATWOE

We will use the following example scenario to illustrate each tool:

ABC Corporation manufactures, sells, and ships computer keyboards. Recently, sales are down, and the CEO of ABC Corp. has asked Justin and Harleen, two project managers, to determine what is causing the reduction in sales. Justin and Harleen have discovered that a number of customers have stopped buying from ABC Corporation because they are unhappy with how long it took to receive their orders, as well as what the customers have described as poor customer service.

❖ 1.2.1. Root-Cause Analysis

Root-cause analysis, also known as RCA, is a technique for determining why the problem happened in the first place.

1. It goes deeper than just defining the issue, and it looks to discover underlying problems.
2. The premise of root-cause analysis is that getting to the root of the problem, instead of addressing only symptoms of the problem, can prevent it from happening again.
3. The main activity in root-cause analysis is gathering answers.

Root-cause analysis is frequently used in solving safety problems, for example, if an accident has occurred in a workplace. It is a way for management to try to ensure that the accident does not reoccur. Other industries that make frequent use of RCA include engineering and industrial manufacturing.

A good analogy for the purpose of a root-cause analysis is the following: if you broke your arm, you would want to take painkillers to feel better. However, while painkillers would eliminate the pain, they wouldn't eliminate the cause of the pain: the broken bone.

In our example of ABC Corporation, Justin and Harleen might be tempted to blame issues on shipping on some recent bad weather that the area experienced. However, they need to gather more information. They speak with both customers and internal departments at ABC, to try to get to the **root** of the issue.

❖ 1.2.2. Diagramming

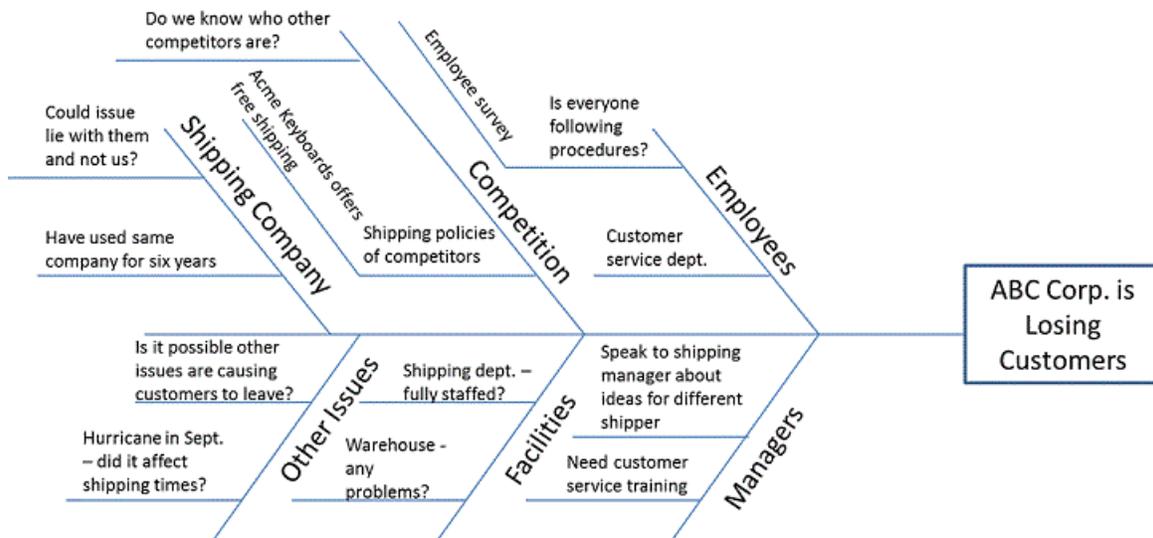
Diagramming is another way to define a problem.

1. Use what's commonly referred to as a fishbone diagram or an Ishikawa diagram.
2. Fill in the problem as you see it.
3. Use the corresponding branches to flesh out the cause of the problem.

This is a good way to examine relationships between potential causes of the problem.

The diagram typically looks like the bones of a fish, with the problem at the “head” of the fish and the “bones” branching out to hold more information. Diagramming is a way to visually represent what is going on; it may be a great method for problem-solvers who are visual learners.

The following is an example of a fishbone diagram for ABC Corporation, from our original example.



❖ 1.2.3. The Six Ws

The method known as the Six Ws is a problem-identification mechanism wherein you ask yourself six W questions:

1. Who?
2. What?
3. When?

4. Where?
5. Why?
6. What if?

Let's go back to our example of Justin and Harleen of ABC Corporation and the problem they are trying to identify. The following might be how they answered the Six Ws:

1. **Who?** Customers are choosing to leave ABC Corp.
2. **What?** Sales are down, and former customers are choosing the competition.
3. **When?** This started recently, within the last two quarters.
4. **Where?** The problem is affecting customers from all over the country. Most of ABC Corp.'s business is located in the Northeast US.
5. **Why?** Customers are citing slow shipping times and lack of customer service as reasons why they are using other suppliers.
6. **What if?** What if they looked into using a different shipping company to ship orders? For the customer service problem, what if they provided customer service staff with mandatory training?

❖ 1.2.4. CATWOE

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The CATWOE methodology is a checklist system for defining a problem. This problem-defining mechanism is a systems-based approach, meaning it is best applied to the overall system in which the problem lies.

CATWOE is an acronym for the following:

1. **C**ustomers
2. **A**ctors
3. **T**ransformation process
4. **W**orld view
5. **O**wner
6. **E**nvironmental constraints

Customers

The C in CATWOE stands for customers. You should ask yourself:

1. Who are your customers?
2. How are they affected by the problem you are dealing with?

Actors

The A in CATWOE stands for actors. You should ask yourself:

1. Who is primarily involved in the situation?

Transformation Process

The T stands for transformation process. You should ask yourself:

1. How are the inputs to the system transformed into outputs?
2. What are the inputs, and where did they come from?
3. What are the outputs, and where do they go?

World View

The W stands for world view. You should ask yourself:

1. What is the big picture for your situation?
2. What is the real problem you need to address?
3. Once you solve the problem, what are the wider implications of your solution?

Owner

The O stands for owner. You should ask yourself:

1. Who is the owner of the process or situation?
2. Can they help you?

Environmental Constraints

The E stands for environmental constraints. You should ask yourself:

1. What are the outside factors that could affect your solution?
2. What are the limits you might face, for example, in terms of resources or finances?

3. How could you mitigate these limits and factors?

Going back to our example of ABC Corporation, Justin and Harleen's CATWOE analysis might look something like this:

1. **Customers:** ABC Corp.'s customers are located across the United States, with the majority being located in the Northeast. They are generally small-business owners, students, and computer-savvy individuals. When shipping is slow, customers get frustrated, and compounding the problem, they've complained that when they call for answers on the shipping issues, they encounter unhelpful customer service representatives.
2. **Actors:** The problem primarily involves the shipping department and the customer service department. The sales department may also be part of the problem.
3. **Transformation process:** Need to possibly use a different shipping option and provide training to customer service reps. May also need to meet with the sales team.
4. **World view:** This problem may involve all of ABC Corp. Each department may need training in customer service. The shipping problem may be with the carrier, but it may be with the sales team and the expectations they are giving customers.
5. **Owner:** The owner of this problem may be threefold: the shipping department, the customer service department, and sales.
6. **Environmental constraints:** ABC Corp. may have to start charging more for shipping if they use a different carrier, which may anger customers.

Exercise 1: Creating a Fishbone Diagram

 10 to 20 minutes

In this exercise, you will fill out the blank fishbone diagram in the class files to flesh out and define a problem that you are facing or have faced in the past.

1. Did using the fishbone diagram help you lay out the issue?
2. Did having the visual representation of your problem help you to clearly define it?

❖ E1.1. Solution:

Solution

1. Answers will vary, depending on the issue, but most often, using a fishbone diagram will allow you to see pieces of the problem that you hadn't previously thought about.
2. Answers will vary, depending on the issue, but the benefits of using a fishbone diagram usually include that different categories can be explored and it may help spark creativity in the user.

Evaluation
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Conclusion

In this lesson, you have learned:

1. Why defining the problem is an important step.
2. Some tools you can use to help define your problem.

LESSON 2

Generating Possible Solutions

Topics Covered

- To use a mind map to generate solutions.
- Brainstorming techniques that can help get you thinking about solutions.
- How to shift your perspective to come up with even more possible solutions.
- To challenge assumptions.

Introduction

Now what you've taken the time to define your problem, it's time to move to the next phase in the problem-solving process, which is generating possible solutions to that problem.

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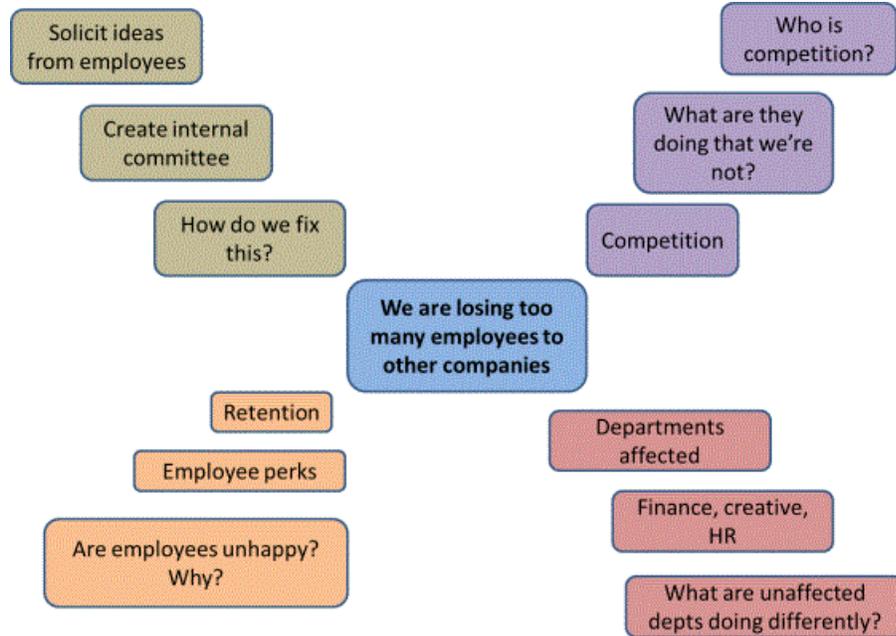
2.1. Use a Mind Map

One way to come up with possible solutions to a problem is to use a technique called mind mapping.

1. A way to help stimulate your brain to start thinking creatively.
2. In order to allow you to easily see associations in your ideas, mind maps are generally drawn on only one sheet of paper.

Steps in creating a mind map:

1. Write your main problem or issue in the center of the paper, and circle it.
2. Create branches from that circle, with essential information on them.
3. Add even more branches with more detail, resulting in something that looks like the following:



It is important to keep in mind that there really are no rules with mind mapping. Mind mapping is like free-word association. You jot down anything that seems important or that could be a solution. When the information is visually displayed in this way, you will see possibilities that hadn't crossed your mind previously.

Some people use pictures, graphics, and different colors on their mind maps. Use whatever you think will get your creative juices flowing!

Exercise 2: Creating a Mind Map

 10 to 10 minutes

In this exercise, you will create a mind map.

1. Think of a problem that you have encountered on the job; it could be something you are experiencing now, or a problem that was previously resolved. Setting a time limit of 10 minutes, create a mind map for the issue on a single sheet of paper. Remember that there are no rules to mind mapping. What does your mind map look like?
2. Did using a mind map help you generate ideas that you hadn't previously thought of?

❖ E2.1. Solution:

Solution

1. Answers will vary; each person's mind map will look unique to that person and his or her problem. Even if two participants map out the same issue, the maps will look different. The purpose of the mind map is to allow you to be creative and consider new thoughts and ideas.
2. Answers will vary, but the usefulness of a mind map is in that there are no rules and no right or wrong answers. It is a way to visually represent concepts and ideas, in order to generate solutions, based on a problem that needs to be solved.



2.2. Brainstorming Techniques

Brainstorming is another way you can start generating possible solutions to your problem.

1. Brainstorming can be done in a group or alone.
2. It should be done quickly, without too much thought.
3. There are no “right” or “wrong” ideas.
4. Set a limit on how long the brainstorming session will take place.
5. Note anything that comes to mind in your specified time frame.

If you're brainstorming as part of a team, you should be open to any suggestion that arises. Some suggestions that come out of your session may seem ridiculous. However, you should examine every idea. You may be surprised at what comes from the brainstorming session.

There are a few brainstorm techniques we will look at specifically:

1. Freewriting
2. Word association
3. Listing

❖ 2.2.1. Freewriting

Freewriting is a brainstorming technique wherein you let your thoughts flow freely onto paper.

1. You take paper and pen, (or keyboard and computer) set a time limit, and begin writing.
2. There are no rules to freewriting.
3. What comes out of your brain and onto the paper may not even be related to the problem you're trying to solve, but the point of this exercise is not to worry about what comes out; the point is to get your mind going.

❖ 2.2.2. Word association

Word association is another brainstorming technique. You may have done word associations in the past and not even realized it. Maybe someone has said something like this to you before: "What's the first thing that comes to mind when I say the word Italy?"

When you use word association to try to generate solutions to a problem, you free up the right side of your brain, which is the more creative side. Since there are no rules, the logical left side of your brain cannot suppress your creativity with logic!

❖ 2.2.3. Listing

When you use listing to brainstorm, you create a list based on your problem, an idea related to your problem, or even on the opposite of your problem. Again, as in all of the techniques we've discussed, the idea here is to be creative. Don't worry that what you're coming up with is ridiculous or farfetched. The point is not to come up with a list of complete, working solutions; the idea is to get your brain to start thinking creatively.



Exercise 3: Brainstorming

🕒 10 to 20 minutes

In this exercise, you will brainstorm to solve a problem.

1. You work as a salesperson for a medical sales equipment company. One of your most popular products is being recalled for safety issues. You have a number of angry customers, and need to generate some possible solutions to this problem. What brainstorming technique would you use, and why?
2. You decide to use the word association brainstorming technique to come up with some solutions to your problem: customers angry that one of the products you sell is being recalled for safety issues. On a blank sheet of paper, create a word association list based on the term “defective product.” Set a time limit of five minutes and write down everything that comes to mind.

❖ E3.1. Solution:

Solution

1. Answers will vary, but you could use freewriting, word association, or listing. Perhaps you have a different idea for brainstorming. In brainstorming, there are no right or wrong ways to proceed. The goal would be to find a way to satisfy your unhappy customers.
2. Answers will vary, but could look something like this: customers, angry, unhappy, dissatisfied, defective, health, unhealthy, win trust, replace, costly.



2.3. Shift Your Perspective

Once again, we can look to one of the greatest thinkers in history, Albert Einstein, for some wisdom on problem solving. Einstein said, “We can’t solve problems by using the same kind of thinking we used when we created them.”

What he was talking about is one of techniques we can use to generate solutions: shifting perspective. In the case of problem solving, your perspective is how you see the issue. We all have unique experiences, mindsets, and histories, and these affect how we generate solutions to a problem.

What shifting perspective means is thinking about the problem and possible solutions in a way we never have before. The following are some ideas for shifting perspective:

1. Think of the problem as someone else would. Imagine how someone with a different background might problem solve.
2. Seek out different perspectives. This may be a time to speak to colleagues and gather their ideas. Someone with a different perspective may be able to generate solutions that you never thought of.
3. If the problem is something negative, set your mind to thinking about the positives that will result once it is solved. This can help you focus on the issue at hand.



2.4. Challenge Assumptions: Restate the Issue

One final way to generate solutions to your problem is to challenge assumptions by restating the issue. This is a way to broaden the scope of the issue, and creatively come up with solutions.

In the book *The Thinker's Toolkit: 14 Powerful Techniques for Problem* (1998), Morgan D. Jones suggests the following ways to restate the issue:

1. Paraphrase:
 - A. Using different words to state the issue, without losing the original meaning.
 - B. Original Issue: "How can we limit job turnover in our business?"
 - C. Paraphrased issue: "How can we keep our employees from leaving our company to take jobs elsewhere?"
2. 180-Degrees:
 - A. Flipping the problem around.
 - B. A surprisingly effective technique.
 - C. Original problem: "How can we get employees to join our Get Fit Program?"
 - D. 180-degree restatement: "How can we get our employees NOT to join our Get Fit Program?"
3. Broaden Focus:
 - A. Broadening focus on the problem is a way to possibly see other angles by restating the issue within a larger context.
 - B. Original problem: "Do we have enough in the budget to add a new department?"
 - C. Broadened focus statement: "How is the financial health of the company?"
4. Redirect Focus:
 - A. When you redirect the focus of an issue, you make a conscious change to the focus of the problem.
 - B. Original problem: "How can we cut costs?"
 - C. Redirected focus statement: "How can we increase sales?"

Evaluation
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Exercise 4: Checking Your Knowledge

 10 to 20 minutes

In this exercise, you will check your knowledge of what you have learned in this lesson.

1. You work for a local real estate company. Lately, business has been slow and people have been reluctant to put their houses on the market. You need to start generating some sales. How are some ways you could restate your problem?
2. It is six months later, and sales are brisk. You are considering hiring an assistant to help you with listings and house showings, but you are not sure if the cost will be justified. How are some ways you could restate your problem?

❖ E4.1. Solution:

Solution

1. Answers will vary, but you could broaden your focus and ask how sales are for your region, not just for your clients. Also, you could use the 180-degrees technique and ask yourself, “How do I get people not to put their houses on the market?”
2. Answers will vary, but may include paraphrasing your issue, with a question such as: “Do I bring in enough money to pay an assistant?” You could also redirect your focus with a question like: “How can I increase sales enough to pay for an assistant?”

Conclusion

Evaluation
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In this lesson, you have learned:

1. To use a mind map to generate solutions.
2. Brainstorming techniques that can help get you thinking about solutions.
3. How to shift your perspective to come up with even more possible solutions.
4. To challenge assumptions.

LESSON 3

Evaluating and Selecting Alternatives

Topics Covered

- ☑ How to determine the most logical and most reasonable solution to your problem.
- ☑ The principle of Occam's razor and how it applies to the problem-solving process.

Introduction

Now that you've generated some possible solutions to your problem, it's time to move to the next phase in the problem-solving process, which is evaluating and selecting alternatives.



3.1. Determine the Most Workable and Reasonable Solution

By this point, you have learned how to accurately define your problem, as well as how to generate possible solutions using brainstorming and other techniques. Now you need to determine the best possible solution for your particular situation. This means determining which of your proposed solutions is the most workable and reasonable.

❖ 3.1.1. What Is the Best Solution?

The most workable and reasonable solution is likely the one that makes the most sense for your set of circumstances.

1. Is money a consideration?
2. What about time?
3. Or buy-in from management or team members?
4. Each problem and solution will have a different definition of most workable and reasonable.

In Lesson One, we examined the example of ABC Corporation, which manufactures, sells, and ships laptop keyboards. Sales were down and customers were complaining about

poor service. Justin and Harleen, two project managers at the company, were asked by the CEO to determine the problem and come up with a solution.

The most workable and reasonable solution for Justin and Harleen was twofold:

1. To initiate a training program for the customer service reps.
2. To switch to a different shipping company.

They had considered hiring new reps, but that would be too costly. In terms of shipping, they looked at various options, and while changing companies was expensive, their CEO, who had to approve their solution, thought it was best to start fresh to help renew customer confidence.

Exercise 5: Determining the Best Solution

 25 to 30 minutes

In this exercise, you will determine the best solution to a problem.

1. In Lesson Two, you were asked to think of a problem that you have encountered on the job and create a mind map for the issue on a single sheet of paper. Using that mind map, generate possible solutions, and go one step further: determine the most workable and reasonable solution for your situation. Prepare to discuss with the class.
2. Why was this solution the best for your particular situation? What factors did you take into consideration?
3. Would you have come to a different solution if your situation was different? How so?

❖ E5.1. Solution:

Solution

1. Answers will vary; each person's problem and solution will be different. These differences will highlight how there are many factors that determine the most reasonable and workable solution to any given problem.
2. Answers will vary, but factors taken into consideration could include money and budgetary issues, issues with getting approval and buy-in from leaders, and company policies.
3. Answers will vary, but most likely, differences in situations could cause different solutions to be more attractive. For example, the decision on what type of software to purchase for a department, to replace obsolete software, would have a different outcome based on who the decision-maker was: employees using the software, members of the IT team, or management.



3.2. Occam's Razor: Why the Simplest Solution Is Usually the Best

Occam's razor is a problem-solving principle that states that the simplest solution, the one that makes the fewest assumptions, is usually the correct one. Often, in the quest to solve a problem, people make the problem and associated solutions more complex than they need to be.

Stated another way, the more complex the solution, the more assumptions you would have to make. The crux of Occam's razor is: the simplest solution is usually the best one.

❖ 3.2.1. Occam's Razor Example

One of the most well-known examples of the principle of Occam's razor in recent history are crop circles. Appearing beginning in the 1970s, crop circles are patterns in fields, where the grass or other crop is matted down, making what appears to be often-complex patterns when viewed from above.

One explanation was that people were creating the patterns; the other explanation was that UFOs brought aliens to earth, and the aliens created the circles. Considering the complexities of the second explanation, the answer that humans created the circles is the simplest.

Indeed, since the 1970s, there have been people who have come forward to claim responsibility for creating the crop circles. Therefore, Occam's razor, in this case, appears to be correct.

Evaluate
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Exercise 6: Occam's Razor in Practice

 10 to 15 minutes

In this exercise, you will use your knowledge of Occam's razor to answer the following questions.

1. Have you seen examples of Occam's razor at work in your problem-solving efforts? Share your ideas with the rest of the class.
2. What other examples of Occam's razor can you think of?

❖ E6.1. Solution:

Solution

1. Answers will vary, but you remember that Occam's razor states that the simplest, least-complex answer is usually the correct one.
2. Answers will vary, but Occam's razor could apply to many situations.

Conclusion

Evaluation
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In this lesson, you have learned:

1. How to determine the most logical and most reasonable solution to your problem.
2. The principle of Occam's razor and how it applies to the problem-solving process.

LESSON 4

Implementing Your Solution

Topics Covered

- The importance of gaining acceptance from your stakeholders.
- How to determine the resources you will need to implement your solution.
- The importance of and how to implement a contingency plan.

Introduction

Now that you've decided on the most reasonable and workable solution to your problem, it is time to move to the next phase in the process, which is implementing your solution.

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4.1. Gain Acceptance from Stakeholders

You have come up with the best solution to your problem, so you may think that the next step is implementing that solution. However, depending on your situation, you may first need to gain acceptance from stakeholders.

❖ 4.1.1. Who Are Your Stakeholders?

Just who are your stakeholders? Some may be obvious, and some may not be so clear at first. To brainstorm stakeholders beyond the obvious, ask yourself the following questions:

1. Who cares if the problem is solved?
2. Who is affected by the problem?
3. Who benefits if the problem is solved?
4. Who has to give approval?

❖ 4.1.2. How to Get Buy-in

Getting stakeholder buy-in is one of the most important phases in the problem-solving process. Without the buy-in of management, your boss or other stakeholders, your solution may ultimately not be implemented.

By this point in the process, you should know who the stakeholders are. For example, if your solution is to purchase new software for your team, the stakeholders may be your manager, who must give approval for the purchase and your teammates, who will be using the software.

To gain stakeholder approval, follow these steps:

1. Identify your message.
2. Create a clear and concise message.
3. Identify action steps and a communication plan.

❖ 4.1.3. Identify Your Message

Before meeting with stakeholders, identify the message you are going to convey. Typically, you will want to frame your message around the benefits of your solution, and how it will add value to the team, your organization, and so on.

❖ 4.1.4. Compose a Clear and Concise Message

When you create your message, make sure it is clear and concise.

1. Present just the right information for your audience.
2. Generate interest in and support of your solution.
3. Target your message for your particular audience by using appropriate terminology.

The following is an example of a clear and concise email you might send your team about the solution to a problem involving software that they have to use daily:

“Based on an analysis of our team’s needs, as well as technology and price considerations, we have decided to replace our current photo-editing software with ABC PhotoEdit. ABC PhotoEdit has more features and better user ratings, and we are confident that it will solve many of the problems that we’ve all encountered when using AcmePhoto. The new software will be implemented next week. Please see me with any questions or concerns.”

❖ 4.1.5. Identify Action Steps and a Communication Plan

Determine how you will win the support of your stakeholders. Also, you will need to determine how you will present the message. Is it best to deliver it to all the stakeholders as a group? Would it be better to first speak to the stakeholders with the highest power? Or the lowest?

Exercise 7: Gaining Support

 30 to 40 minutes

In this exercise, you will use what you have learned about gaining support to answer the following questions.

1. Thinking back to the problem you cited in lesson 2 and which you generated the most workable solution for in lesson 3, who are your stakeholders?
2. What message would you present to these stakeholders and why?
3. How would you present this message to the stakeholders? Be specific.
4. Which of the following are possible stakeholders?
 - A. The CEO
 - B. A team member
 - C. A member of another team in another department
 - D. All of the above

❖ E7.1. Solution:

Solution

1. Answers will vary; each person's problem, solution, and stakeholders will be different. Possible stakeholders could include your manager, coworkers, the finance department, and so on.
2. Answers will vary, but the message should be clear and concisely written, in order to garner maximum support.
3. Answers will vary by problem, solution, and stakeholders. There are many different ways that the message could be presented, including individually or in a team setting, via email or in person, and so on.
4. D. All of the above



4.2. Define Resources Needed to Implement the Solution

Now that you know what your solution is and have buy-in from stakeholders, it's important to define what resources you will need to implement it. Resources could include money, manpower, supplies, or even training.

It is important to consider intangibles, such as time, training, and people, when you are defining resources that you need to implement your solution. You may need to create a schedule for rolling out your solution.

If your team was going to be using new photo-editing software, the resources needed to implement the solution might include the following:

1. Software licenses: one for each team member
2. Three team members will need extra RAM on their systems, to accommodate the new software
3. Online course in ABC PhotoEdit because the team will need training on how to use it

Exercise 8: Defining Resources

 10 to 15 minutes

In this exercise, you will define resources needed to implement your solution.

1. Thinking back to your problem from lesson 2, what tangible resources would you need to implement your solution?
2. Are there intangible resources that you will need, such as people or training? What are these intangibles?

❖ E8.1. Solution:

Solution

1. Answers will vary, but may include money to make purchases, software, supplies, and so on.
2. Answers will vary; intangible resources could include training on new systems or resources, people from your team or from elsewhere within your organization, and time to implement the solution.



4.3. Implement a Contingency Plan

So what happens if you have your planned solution and are ready to implement it, when something goes wrong? What about all of the hard work you've put into the problem-solving process?

If you remember back to when you generated possible solutions and then determined the most workable and reasonable solution, you will recall that there were a number of solutions that you came up with that you decided not to implement. Your diligence and hard work during the analysis of the solutions will now pay off.

One of these solutions should become your "Plan B." Of course you hope that your original solution will be implemented with no problems; however, that is not always the case. If you have a contingency plan, you should be able to continue implementing a solution without losing too much time and effort.

❖ 4.3.1. What Could Go Wrong?

There are any number of things that could go wrong with any problem/solution. Some examples include:

1. You may not get approval from decision makers.
2. Stakeholders could be reluctant to get on board with your decision.
3. A product or service you planned to implement could become unavailable.

You may choose to create a formal contingency plan or just know what you would do if there is a problem. Either way, this is a step in the process that should not be skipped. Unforeseen issues can crop up at any time and derail your solution. In the best case scenario, you will not need your back-up plan, but it's still important to have it.

In the example of implementing new photo-editing software for your team, the contingency plan could be different software, in case the original choice was unavailable or some other problem occurred. Or, perhaps the contingency plan might be to continue using the original software, but to upgrade team members' monitors and keyboards, to alleviate some problems with the original software. This plan could be implemented if you were not able to get approval for buying the new software.

Exercise 9: Implementing a Plan B

 20 to 25 minutes

In this exercise, you will think about implementing a Plan B to your solution.

1. When thinking of the problem you identified in lesson 2, along with the solutions you developed in lesson 3, which of these solutions could be used as a contingency plan?
2. What is the purpose of a contingency plan?
 - A. Have a backup in case unforeseen issues occur
 - B. Make use of your brainstorming session
 - C. Have a number of ideas to present to your boss for her approval
3. You are the manager of a restaurant. The quality of produce you've been receiving from your produce supplier has been decreasing in the past few months. You brainstorm and decide to switch suppliers; the new supplier you are going to use is more expensive, but their reputation for quality is impeccable. You do not need a contingency plan in this instance because there is nothing that could go wrong with your original plan. True or False?

❖ E9.1. Solution:

Solution

1. Answers will vary, but the contingency plan should be workable and reasonable.
2. A. Have a backup in case unforeseen issues occur
3. False

Conclusion

**Evaluation
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In this lesson, you have learned:

- The importance of gaining acceptance from your stakeholders.
- How to determine the resources you will need to implement your solution.
- The importance of and how to implement a contingency plan.

LESSON 5

Evaluating Your Solution

Topics Covered

- ☑ The importance of following up to ensure that your problem has been solved.
- ☑ How to determine lessons learned to help avoid future problems.
- ☑ To suggest improvements to your solution.

Introduction

Now that you've gained stakeholder acceptance, defined necessary resources, and implemented a contingency plan, you have arrived at the final step in the problem-solving process: evaluating your solution.

5.1. Follow Up to Ensure that the Problem Is Solved

You solved the problem and implemented your solution, so your work is done, right? While it is true that the majority of your work in the problem-solving process has been completed, you need to follow up to make sure that the problem really was solved and that no new problems have surfaced.

At this stage, you or a member of your team should monitor the situation to make sure that the problem really is solved. Monitoring could take many forms, depending on the problem that you were aiming to solve.

Some common ways to monitor the solution to ensure that the problem is solved include:

1. Customer surveys
2. Group or individual meetings
3. Checkpoints

We will discuss each of these monitoring methods.

❖ 5.1.1. Customer Surveys

Customer surveys are useful when the problem that you are attempting to solve is one that affects your customers. For example, say that your department was receiving complaints about slow shipping times, and so your solution was to switch shipping carriers. A good way to follow up would be to conduct customer surveys a few weeks or months after the change is implemented.

❖ 5.1.2. Group or Individual Meetings

Meetings are a good way to check on the progress of many different situations. In particular, this is a great way to follow up on an issue that is affecting your staff or coworkers. For example, say your department has started using new graphic design software as a solution to repeated issues with the previous version. It would be a good idea to schedule a team meeting a few weeks after the change is implemented to see how the team is adapting to the new software and determine if there are any issues.

❖ 5.1.3. Checkpoints

Checkpoints can take different forms to make sure that the problem is indeed solved.

1. Meetings.
2. A brief email or phone call to the people affected by the issue.

For example, this would be a useful method if your team was taking web-based training. You could send a weekly email, asking everyone to indicate how far they are in the training and what they have learned.

❖ 5.1.4. The Importance of Flexibility

One of the most important things to keep in mind during this stage is the importance of being flexible. There is a good chance that your problem may not be solved, or you may even encounter new problems that your solution inadvertently introduced.

Flexibility is an essential skill for a problem solver. Be flexible when presented with issues, new or old, and you will be able to think clearly and rationally about what needs to be done.

Exercise 10: Ensuring That the Problem Is Solved

 30 to 40 minutes

In this exercise, you will...

1. Thinking back to the problem and solutions you brainstormed previously in the course, what are some ways you could ensure that your problem was solved?
2. Which methods of checking in would work best in your particular situation?
3. You and your sales team were having issues with your mobile phones. Sales reps were complaining that their phones were dropping service during crucial calls. You brainstormed the issue and decided to switch mobile carriers. You are now wondering if the new phones and service have solved the problem. How can you check in and determine if the problem is solved?
 - A. Customer surveys
 - B. Individual meetings
 - C. Checkpoints
4. You work as the customer service manager at a hardware store. You have been receiving feedback from multiple customers that the paint your store sells is low quality. Many complaints have come in, and so you recently decided to begin selling a new brand of paint. How can you check in and determine if the problem is solved?
 - A. Customer surveys
 - B. Individual meetings
 - C. Checkpoints

❖ E10.1. Solution:

Solution

1. Answers will vary, since each person's problem and solutions are different.
2. Answers will vary, but may include using email or phone check-ins, checkpoints, or surveys.
3. C. Checkpoints. In this situation, customer surveys would not be appropriate, and individual meetings would likely be too time-consuming. Instituting quick checkpoints now and a few weeks out with your team, possibly via email, would be a good way to check in on the problem.
4. A. Customer surveys. In this case, surveying customers who are using the new brand of paint should be an effective way to determine if the paint is an improvement.



5.2. Determine Lessons Learned, to Avoid Future Problems

An important step in the final portion of the problem-solving process is to determine lessons learned. Lessons learned are crucial for avoiding future problems, as well as for any problem solving that you will need to undertake in the future.

To determine lessons learned:

1. Try to determine what caused the problem.
2. Were there any things you could have done differently when solving the problem?
3. Was the solution you chose to implement the best one? Should you have chosen a different solution?
4. Record lessons learned and share with the team if appropriate.

Let's look closer at each of these steps.

❖ 5.2.1. Try to Determine the Problem's Cause

Now that you are at the end of the process, are you able to determine what caused the problem originally? If you can determine this, you will be more likely to avoid the problem in the future.

❖ 5.2.2. What Could You Have Done Differently?

The solution you implemented was the most workable and reasonable. Did this turn out to be the case when it was actually executed? With hindsight, are there things you should have done differently?

❖ 5.2.3. Was It the Best Solution?

Was there a different solution, perhaps one that you brainstormed but disregarded, that would have worked better? Why?

❖ 5.2.4. Record Lessons Learned and Share

Make sure to record lessons learned at this stage of the process. This information may be useful to you in the future, or even to other team members or coworkers within your organization. Perhaps another department is experiencing a similar situation. That department could most likely use your lessons learned to help solve their problem.

Evaluation
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Exercise 11: Determining Lessons Learned

 10 to 15 minutes

In this exercise, you will examine lessons learned from the problem you faced.

1. Think of a problem and solution that you implemented at work or in your personal life. What lessons did you learn from the problem?
2. How would you record your lessons learned?
3. Who would most benefit from hearing about the lessons you learned in your problem-solving situation?

❖ E11.1. Solution:

Solution

1. Answers will vary, and will likely be different for every problem and solution.
2. Answers will vary, but could include in a database, a spreadsheet, an email you distribute to the team, and so on.
3. Answers will vary, but could include your manager, your CEO, your team members, or a different team or department within your organization.



5.3. Suggest Improvements to the Solution

Another important final piece of the problem-solving puzzle is suggesting improvements to the solution. Most likely, you are able to implement some final changes to your solution.

For example, say you have followed up on the new software that your team is using for their graphic design tasks. You've collected feedback from the team, and it seems that most everyone notes that if they had dual monitors, it would be easier to use the new software.

You are able to recommend this improvement to your original solution, which was the new software, to your manager. Your manager agrees that getting the team second monitors is a worthwhile investment.

In this example, you were able to implement a small improvement to your original solution that enhanced that solution, without a lot of time or effort.

❖ 5.3.1. Celebrate Achievements

While you are suggesting improvements and doing the final analysis of your solution and how well it worked, it's important at this stage to celebrate your achievements.

Exercise 12: Suggesting Improvements

 10 to 15 minutes

In this exercise, you will suggest improvements to your solution.

1. What do you think would be the benefits of suggesting improvements to your solution?
2. How are some ways you could celebrate your achievements?

❖ E12.1. Solution:

Solution

1. Answers will vary, but could include gaining efficiencies with future problem-solving processes or improving the original solution so customers or teammates are even more satisfied.
2. Answers will vary, but could include a team lunch or some other gathering.

Conclusion

**Evaluation
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In this lesson, you have learned:

1. The importance of following up to ensure that your problem has been solved.
2. How to determine lessons learned to help avoid future problems.
3. To suggest improvements to your solution.