



TRENDS

Here are a few trends in Communications Management that might help you to improve and manage communication for your projects more effectively.

- ★ **Inclusion of stakeholders in project reviews and meetings.** Teams are increasingly opening up internal meetings and project reviews to stakeholders in order to get feedback as soon as possible. This allows for greater stakeholder collaboration in project goal setting and execution.
- ★ **Social media** is used to keep large numbers of stakeholders up to date on interim deliverables in projects and gather feedback about strategic decisions.

TAILORING



When you make changes to the processes your team will use during the course of your project, there are a few considerations that might influence your decisions:

- ★ Are your stakeholders internal to your team or your organization?
- ★ Where are your stakeholders located? Can they communicate with you face-to-face?
- ★ What technology can you use to communicate?
- ★ Can you find a way to have your project contribute to an organizational knowledge repository?

AGILE CONSIDERATIONS

Agile teams work to keep all of their communications transparent and freely available to all stakeholders. They include stakeholders in early meetings and review early work products with them in order to incorporate their feedback as early as possible. Agile principles hold that sharing information early and often with team members and external stakeholders helps to keep everyone on the same page about what's being built so they can collaborate in decision making and build a product most efficiently.

Question Clinic: The calculation question



YOU'LL RUN ACROSS A BUNCH OF QUESTIONS ON THE EXAM ASKING YOU TO USE SOME OF THE FORMULAS THAT YOU LEARNED. LUCKILY, THESE ARE SOME OF THE EASIEST QUESTIONS THAT YOU CAN ANSWER.

This is the wrong answer you'd get if you calculate the number of lines of communication if you include the team and two sponsors, but forget to include the project manager.

This wrong answer is the number of lines of communication BEFORE the team size was increased. You have 13 people (10 team members, 2 client sponsors, and you), so the number of lines is $13 \times 12 \div 2 = 78$.

This wrong answer is the number of lines of communication AFTER the team size was increased by 30%. You have 16 people (13 team members, 2 client sponsors, and you), so the number of lines is $16 \times 15 \div 2 = 120$.

12. You're managing a project with two client sponsors, and you have a 10-person team reporting to you. You've been given a budget increase, which allowed you to increase your team size by 30%. How many lines of communication were added?

- A. 66
- B. 78
- C. 42
- D. 120

Aha! Here's the right answer. Take the number of lines for 16 people and subtract the number of lines for 13 people: $120 - 78 = 42$.

WHEN YOU SIT DOWN TO TAKE AN EXAM AT A COMPUTER TESTING CENTER, YOU'LL BE GIVEN SCRATCH PAPER. YOU'LL ALSO HAVE 15 MINUTES TO GO THROUGH A TUTORIAL THAT SHOWS YOU HOW TO USE THE EXAM SYSTEM. BEFORE YOU FINISH THE TUTORIAL, TAKE A MINUTE AND WRITE DOWN ALL OF THE FORMULAS. WRITE DOWN THE EARNED VALUE FORMULAS AND THE FORMULA TO CALCULATE THE LINES OF COMMUNICATION ON THE SCRATCH PAPER. THAT WILL MAKE ANY CALCULATION QUESTION EASY.



HEAD LIBS



Try coming up with your own calculation question! But this time, try using one of the earned value formulas from Chapter 7.

You are managing a _____ project.

You have _____ (kind of project), _____,

and _____ (a value needed for the calculation) _____ (another value needed for the calculation)

Calculate _____ (an irrelevant value that is NOT needed for the calculation) for your project.

(name of a formula)

A. _____
(the answer you'd get if you plug the wrong value into the formula)

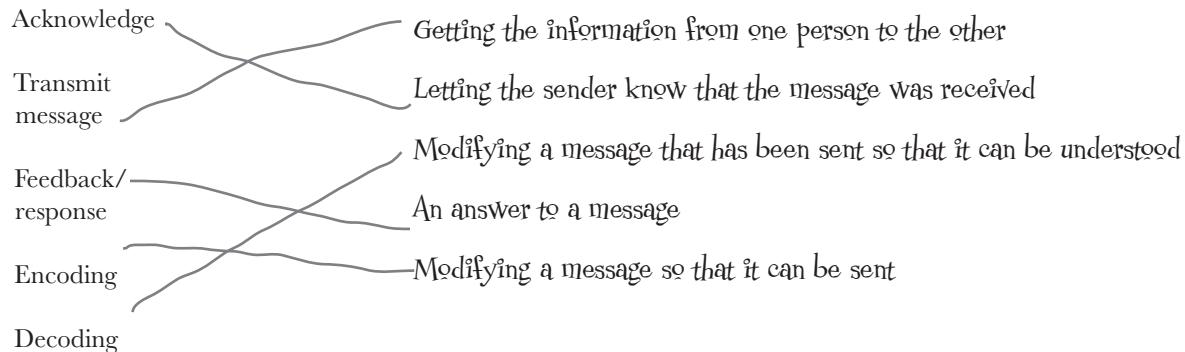
B. _____
(the answer you'd get if you used the wrong formula)

C. _____
(the correct answer)

D. _____
(a totally bizarre answer that comes out of nowhere)

WHAT'S MY PURPOSE

Match each communication element to what it does



Exercise Solution

Jeff and Charles are interviewing new bartenders to help with the expanded space.
Choose which kind of communication is being used in each situation.

The candidate repeated the question. That's a great example of feedback.

1. One applicant came in 30 minutes late, and was dressed unprofessionally. The guys knew that he would not be a good fit for the position.

Paralingual
 Nonverbal
 Feedback

3. Charles asked the next applicant if he knew how to make a sidecar. He said “A sidecar?” Sure. It’s one part brandy or cognac, one part Cointreau, and one part lemon juice.”

Paralingual
 Nonverbal
 Feedback

2. Charles asked an applicant about her background. Her tone of voice was really sarcastic, and he got the impression she didn’t take the job seriously. Charles and Jeff decided to pass on her too.

Paralingual
 Nonverbal
 Feedback

4. Then the applicant told them about his background as a bartender for other retro clubs. As he spoke, he made eye contact with them and made sure to confirm agreement with them.

Paralingual
 Nonverbal
 Feedback



Exercise Solution

Choose which kind of communication is being used in each situation.

1. You and your business analysts write a requirements specification for your project.

<input type="checkbox"/> Formal verbal	<input type="checkbox"/> Informal verbal
<input checked="" type="checkbox"/> Formal written	<input type="checkbox"/> Informal written

2. You call up a supplier for materials for your project to let him know that you are a week late, so he's got a little flexibility in his delivery schedule.

<input type="checkbox"/> Formal verbal	<input checked="" type="checkbox"/> Informal verbal
<input type="checkbox"/> Formal written	<input type="checkbox"/> Informal written

3. You present your project's status to your company's executive committee.

<input checked="" type="checkbox"/> Formal verbal	<input type="checkbox"/> Informal verbal
<input type="checkbox"/> Formal written	<input type="checkbox"/> Informal written

4. You send an email to some of your team members to get more information about an issue that has been identified on your project.

<input type="checkbox"/> Formal verbal	<input type="checkbox"/> Informal verbal
<input type="checkbox"/> Formal written	<input checked="" type="checkbox"/> Informal written

5. You leave a voicemail message for your test team lead following up on an issue he found.

<input type="checkbox"/> Formal verbal	<input checked="" type="checkbox"/> Informal verbal
<input type="checkbox"/> Formal written	<input type="checkbox"/> Informal written

6. You IM with your team members.

<input type="checkbox"/> Formal verbal	<input type="checkbox"/> Informal verbal
<input type="checkbox"/> Formal written	<input checked="" type="checkbox"/> Informal written

7. You prepare an RFP (request for proposals) for vendors to determine which of them will get a chance to contract a new project with your company.

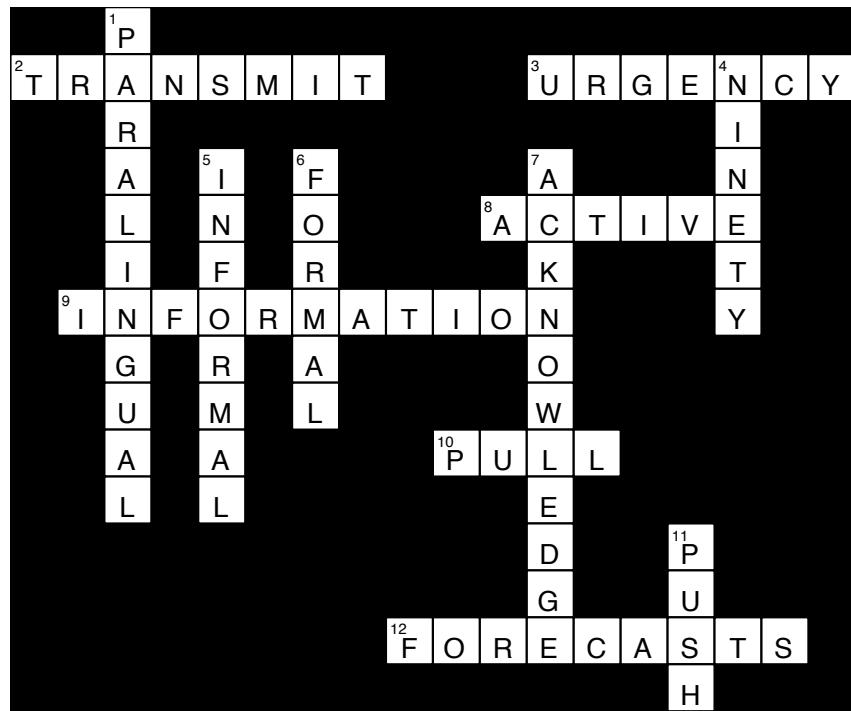
<input type="checkbox"/> Formal verbal	<input type="checkbox"/> Informal verbal
<input checked="" type="checkbox"/> Formal written	<input type="checkbox"/> Informal written

Anything that has to do with a contract is always formal written.



Communicationcross

Take some time to sit back and give your right brain something to do. It's your standard crossword; all of the solution words are from this chapter.

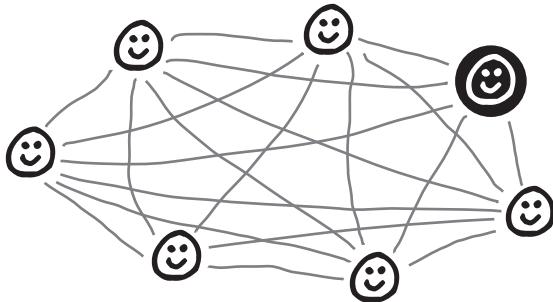




Sharpen your pencil Solution

You'll need to know how to calculate the number of lines of communication for the exam...but don't worry, it's really easy once you get a little practice.

1. You're managing a project with five people on the team, plus one additional stakeholder—the sponsor. Draw in all the channels of communication on this picture.



2. Wow, that was a lot of work. Luckily, you won't need to do that again. Now do it the easy way: use the formula to figure out how many lines of communication there are for seven people.

$$\# \text{ lines for } 7 \text{ people} = \frac{7 \times (7 - 1)}{2} = (7 \times 6) \div 2 = 21$$

3. OK, now let's say that you've added two team members and two more stakeholders, so there are now 11 people on the project who need to communicate with one another. How many lines did you add?

First, figure out how many lines there are for 11 people:

$$\# \text{ lines for } 11 \text{ people} = \frac{11 \times (11 - 1)}{2} = (11 \times 10) \div 2 = 55$$

So how many lines were added when four people joined the seven-person project?

$$\begin{aligned} \# \text{ lines added} &= \# \text{ lines for } 11 \text{ people} - \# \text{ lines for } 7 \text{ people} \\ &= 55 - 21 = 34 \end{aligned}$$

Exam Questions

1. Keith, the project manager of a large publishing project, sends an invoice to his client. Which communication type is he using?
 - A. Formal verbal
 - B. Formal written
 - C. Informal written
 - D. Informal verbal
2. Which of the following is NOT an input to the Plan Communications Management process?
 - A. Enterprise environmental factors
 - B. Organizational process assets
 - C. Information gathering techniques
 - D. Project Management plan
3. You take over for a project manager who has left the company and realize that the team is talking directly to the customer and having status meetings only when there are problems. The programming team has one idea about the goals of the project, and the testing team has another. Which document is the FIRST one that you should create to solve this problem?
 - A. Communications Management plan
 - B. Status report
 - C. Meeting agenda
 - D. Performance report
4. You ask one of your stakeholders how things are going on her part of the project and she says, “things are fine” in a sarcastic tone. Which is the BEST way to describe the kind of communication that she used?
 - A. Feedback
 - B. Active listening
 - C. Nonverbal
 - D. Paralingual
5. You’re managing an industrial design project. You created a Communications Management plan, and now the team is working on the project. You’ve been communicating with your team, and now you’re looking at the work performance data to evaluate the performance of the project. Which of the following BEST describes the next thing you should do?
 - A. Use formal written communication to inform the client of the project status.
 - B. Compare the work performance data against the time, cost, and scope baselines and look for deviations.
 - C. Update the organizational process assets with your lessons learned.
 - D. Hold a status meeting.

Exam Questions

6. You have five people working on your team, a sponsor within your company, and a client, all of whom need to be kept informed of your project's progress. How many lines of communication are there?

- A. 28
- B. 21
- C. 19
- D. 31

7. Which of the following is NOT an example of active listening?

- A. Nodding your head in agreement while someone is talking
- B. Restating what has been said to be sure you understand it
- C. Asking questions for clarification
- D. Multitasking by checking your email during a conversation

8. Sue sent a message to Jim using the company's voicemail system. When he received it, Jim called her back. Which of the following is true?

- A. Sue encoded the voicemail; Jim decoded it, and then encoded his feedback message.
- B. Sue decoded her voicemail message; Jim encoded his phone call and decoded the feedback.
- C. Jim sent feedback to Sue, who encoded it.
- D. Sue decoded her voicemail message and Jim encoded his feedback.

9. You're managing a construction project. Suddenly the customer asks for some major changes to the blueprints. You need to talk to him about this. What's the BEST form of communication to use?

- A. Informal written
- B. Informal verbal
- C. Formal written
- D. Formal verbal

10. Kyle is the project manager of a project that has teams distributed in many different places. In order to make sure that they all get the right message, he needs to make sure that his project plan is translated into Spanish, Hindi, French, and German. What is Kyle doing when he has his communications translated?

- A. Encoding
- B. Decoding
- C. Active listening
- D. Effective listening

Exam Questions

11. There are 15 people on a project (including the project manager). How many lines of communication are there?

- A. 105
- B. 112
- C. 113
- D. 52

12. Which communication process is in the Monitoring and Controlling process group?

- A. Manage Communications
- B. None of the communications processes
- C. Plan Communications Management
- D. Monitor Communications

13. You're working at a major conglomerate. You have a 24-person team working for you on a project with 5 major sponsors. The company announces layoffs, and your team is reduced to half its size. How many lines of communication are on your new, smaller team?

- A. 66
- B. 153
- C. 276
- D. 406

14. You've consulted your earned value calculations to find out the EAC and ETC of your project. Which of the following is the BEST place to put that information?

- A. Work performance information
- B. Forecasts
- C. Quality control measurements
- D. Lessons learned

15. Which of the following is an example of noise?

- A. An email that's sent to the wrong person
- B. A project manager who doesn't notice an important clause in a contract
- C. Garbled text and smudges that make a fax of a photocopy hard to read
- D. When the team is not paying attention during a status meeting

Answers

~~Exam Questions~~

1. Answer: B

Any communication that can be used for legal purposes is considered formal written communication. An invoice is a formal document.

See the word "technique"?
That's a good indication that
it's a tool and not an input.

2. Answer: C

Information gathering techniques are not part of Plan Communications Management.

3. Answer: A

The Communications Management plan is the first thing you need to create in this situation. It will help you organize the meetings that are taking place and get everyone on the same page. The Communications Management plan will help you to streamline communications so that the customer can use you as a single point of contact, too.

**4. Answer: D**

Paralingual communication happens when additional information is conveyed by the tone or pitch of your voice. It's when you use more than just words to communicate.

5. Answer: B

When you look at work performance data, you're in the Monitor Communications process. And what do you do with the work performance data? You compare it against the baselines to see if your project is on track! If it isn't, that's when you want to get the word out as quickly as possible.

A lot of people choose B here. Don't forget to include yourself! Look out for questions like this on the exam too.

6. Answer: A

The formula for lines of communication is $n \times (n - 1) \div 2$. In this problem there were seven people named, plus you. $(8 \times 7) \div 2 = 28$.

Answers

~~Exam Questions~~

7. Answer: D

All of the other options show the speaker that you understand what is being said. That's active listening.

Active listening sometimes means saying things like "I agree," or "can you explain that a little further?"

8. Answer: A

This question is just asking if you know the definitions of encode, decode, and feedback. Encoding is making a message ready for other people to understand, while decoding it involves receiving the message and understanding it. Feedback means letting the sender know that you got the message.

Any time you see anything about a formal document in communication with a client, it's formal written.

9. Answer: C

Any time you are communicating with the customer about the scope of your project, it's a good idea to use formal written communication.

10. Answer: A

He has to encode his message so that others will understand it.

11. Answer: A

$(15 \times 14) \div 2 = 105$. This one is just asking if you know the formula $n \times (n-1) \div 2$.

12. Answer: D

Monitor Communications is the only Monitoring and Controlling process in Communications Management.

Answers~~Exam Questions~~**13. Answer: B**

There are now 12 team members, 5 sponsors, and a project manager. That gives you 18 people. Use the formula: $n \times (n - 1) \div 2$ to calculate this: $18 \times 17 \div 2 = 153$.

*Did you get one of the other answers?
Make sure you included the five sponsors
and the project manager!*

14. Answer: B

The idea behind forecasts is that you are using the earned value calculations that forecast the completion of the project to set everyone's expectations. That's why you use EAC (which helps you estimate your project's total cost) and ETC (which gives you a good idea of how much more money you think you'll spend between now and when it ends).

15. Answer: C

There are plenty of ways that communication can go wrong. When you send email to the wrong person, your communication had trouble—but that's **not** noise. Noise is the specific thing that interferes with the communication. In this case, the garbled text is a great example of noise.

OH, I GET IT. I ALREADY CAME UP WITH GOOD COST AND TIME FORECASTS USING EAC AND ETC. NOW I CAN PACKAGE THEM UP AS FORECASTS AND SHARE THEM WITH THE TEAM.



11 Risk management

Planning for the unknown



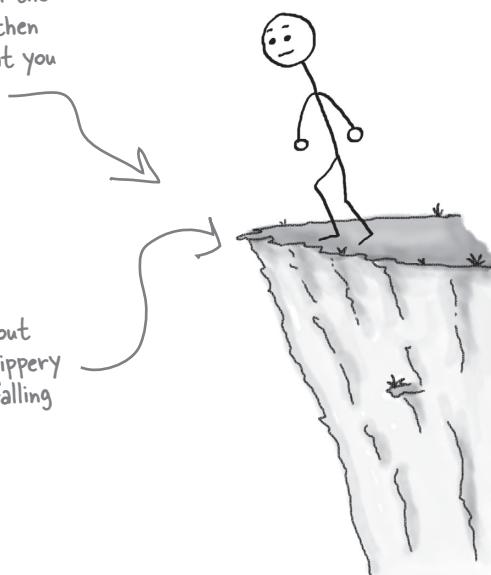
Even the most carefully planned project can run into trouble. No matter how well you plan, your project can always run into **unexpected problems**. Team members get sick or quit, resources that you were depending on turn out to be unavailable—even the weather can throw you for a loop. So does that mean that you’re helpless against unknown problems? No! You can use **risk planning** to identify potential problems that could cause trouble for your project, **analyze** how likely they’ll be to occur, take action to **prevent** the risks you can avoid, and **minimize** the ones that you can’t.

What's a risk?

There are no guarantees on any project! Even the simplest activity can run into unexpected problems. Any time there's anything that **might** occur on your project and change the outcome of a project activity, we call that a **risk**. A risk can be an event (like a fire), or it can be a condition (like an important part being unavailable). Either way, it's something that may or may not happen...but if it does, you will be forced to change the way you and your team work on the project.

If your project requires that you stand on the edge of a cliff, then there's a risk that you could fall.

If it's very windy out or the ground is slippery and uneven, then falling is more likely.



A risk is any uncertain event or condition that **might** affect your project. Not all risks are negative.

Not all risks are negative

Some events (like finding an easier way to do an activity) or conditions (like lower prices for certain materials) can help your project! When this happens, we call it an **opportunity**...but it's still handled just like a risk.

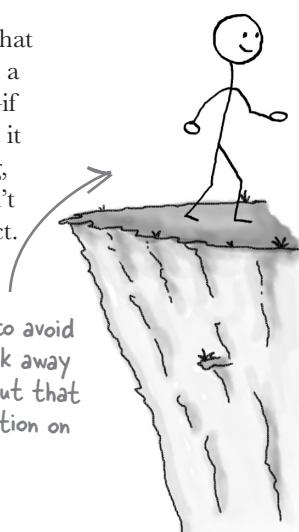
How you deal with risk

When you're planning your project, risks are still uncertain: they haven't happened yet. But eventually, some of the risks that you plan for *do* happen. And that's when you have to deal with them. There are five basic ways to handle a risk:

1 Avoid

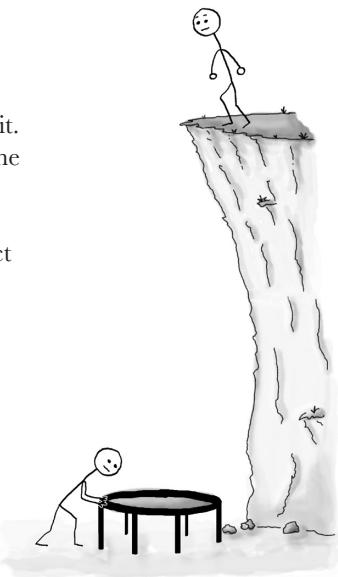
The best thing that you can do with a risk is avoid it—if you can prevent it from happening, it definitely won't hurt your project.

The easiest way to avoid this risk is to walk away from the cliff...but that may not be an option on this project.



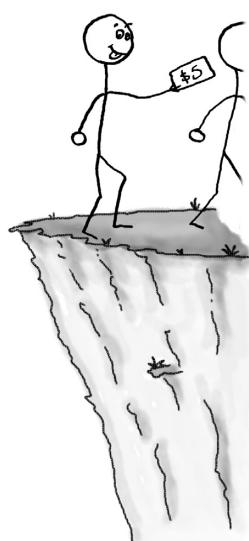
2 Mitigate

If you can't avoid the risk, you can mitigate it. This means taking some sort of action that will cause it to do as little damage to your project as possible.



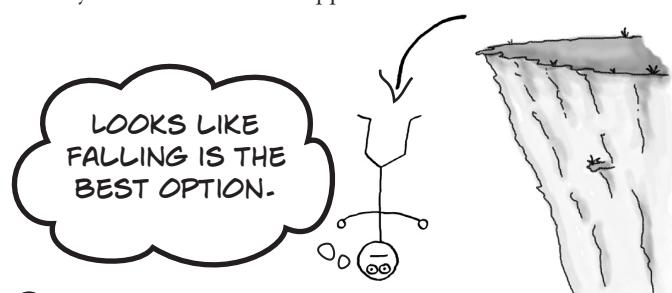
3 Transfer

One effective way to deal with a risk is to pay someone else to accept it for you. The most common way to do this is to buy insurance.



4 Accept

When you can't avoid, mitigate, or transfer a risk, then you have to accept it. But even when you accept a risk, at least you've looked at the alternatives and you know what will happen if it occurs.



5 Escalate

If the risk is not in your project's scope, you might need to tell somebody else about it to find an appropriate response.

Plan Risk Management

By now, you should have a pretty good feel for how each of the planning processes works. The past few knowledge areas started out with their own planning process, and Risk Management is no different. You start with the **Plan Risk Management** process, which should look very familiar to you.

You'll need to see if there are standard templates, roles and responsibilities, or risk categories that your company uses.



Organizational process assets

Are people at your company risk takers? Do they play it safe? Every company has people with different attitudes about risk.



Enterprise environmental factors

You'll learn more about this one in Chapter 13.

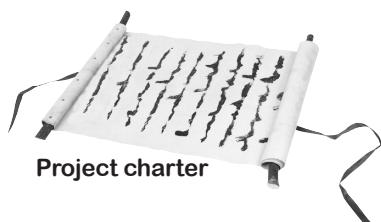


Stakeholder register



By the time a risk actually occurs on your project, it's too late to do anything about it. That's why you need to plan for risks from the beginning and keep coming back to do more planning throughout the project.

Inputs



Project charter



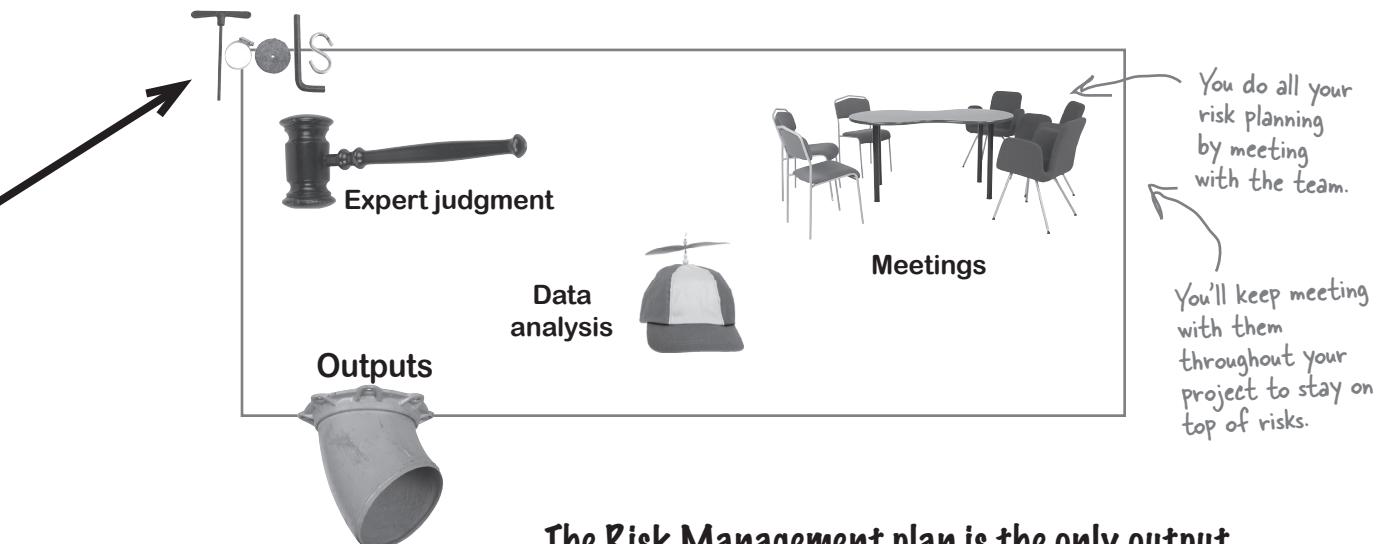
Project Management plan



Watch it!

Are you starting to see a pattern here?
You may get a question on the exam that asks which processes use organizational process assets! Think about why you need them for Plan Risk Management and the other planning processes. That should help you remember which processes need them.

You can figure out why you need these Project Management plans and the charter. Take a minute to think it through.



The Risk Management plan is your guide to identifying and analyzing risks on your project.



Risk Management plan

It tells you who identifies and analyzes the risks, how they do it, and how often it happens.

The Risk Management plan is the only output

It tells you how you're going to handle risk on your project—which you probably guessed, since that's what management plans do. It says how you'll assess risk on the project, who's responsible for doing it, and how often you'll do risk planning (since you'll have to meet about risk planning with your team throughout the project).

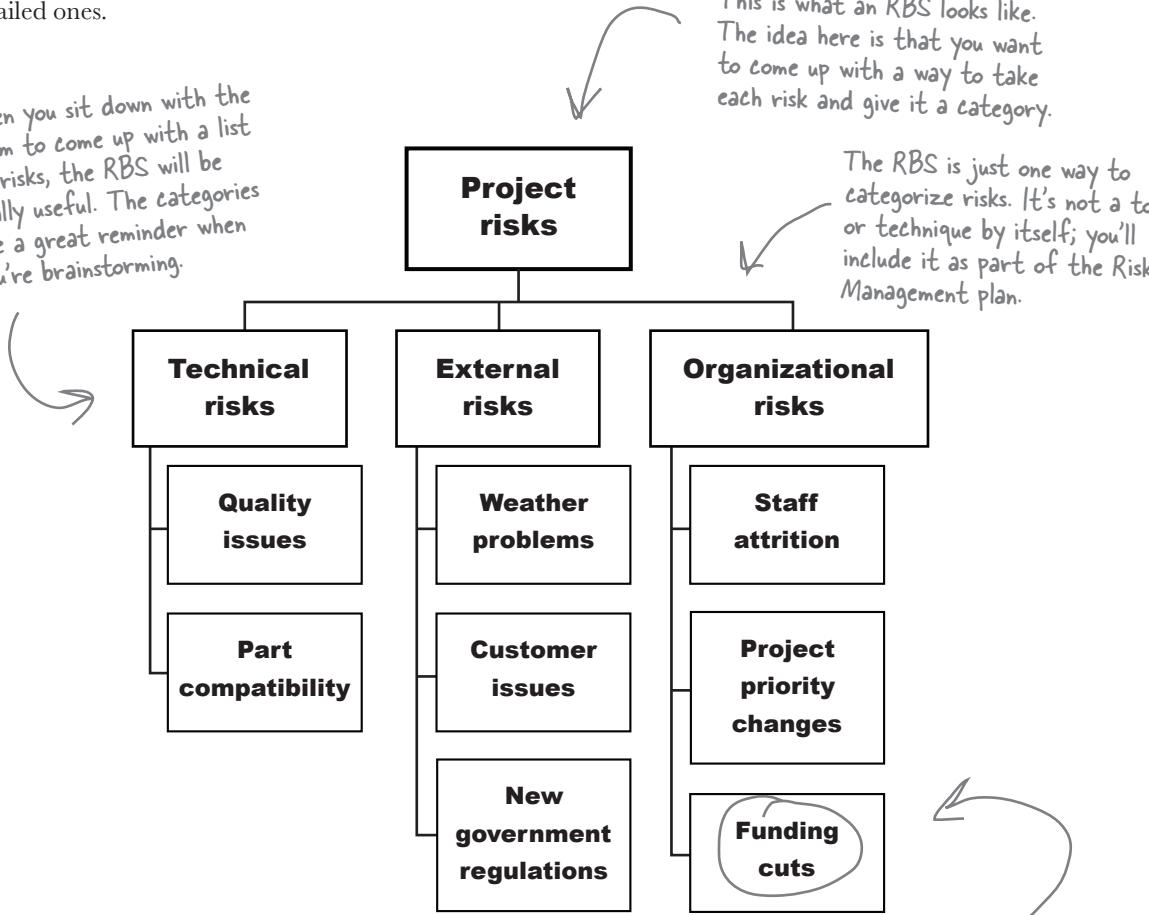
The plan has parts that are really useful for managing risk:

- It has a bunch of **risk categories** that you'll use to classify your risks. Some risks are technical, like a component that might turn out to be difficult to use. Others are external, like changes in the market or even problems with the weather. Risk categories help you to build a **risk breakdown structure (RBS)**.
- You'll need to describe the methods and approach you'll use for identifying and classifying risks on your project. This section of the document is called the **methodology**.
- It's important to come up with a plan to help you figure out how big a risk's impact is and how likely a risk is to happen. The impact tells you how much damage the risk will cause to your project. A lot of projects classify impact on a scale from minimal to severe, or from very low to very high. This section of the document is called the **definitions of probability and impact**.

Use a risk breakdown structure to categorize risks

You should build guidelines for risk categories into your Risk Management plan, and the easiest way to do that is to use a **risk breakdown structure** (RBS). Notice how it looks a lot like a WBS? It's a similar idea—you come up with major risk categories, and then decompose them into more detailed ones.

When you sit down with the team to come up with a list of risks, the RBS will be really useful. The categories are a great reminder when you're brainstorming.





Sharpen your pencil

Take a look at how each of these project risks is handled and figure out if the risk is being avoided, mitigated, transferred, or accepted.

1. Stormy weather and high winds could cause very slippery conditions, so you put up a tent and wear slip-resistant footwear to keep from losing your footing.

Avoided

Mitigated

Transferred

Accepted

2. You buy a surge protector to make sure a lightning strike won't blow out all of your equipment.

Avoided

Mitigated

Transferred

Accepted

3. Flooding could cause serious damage to your equipment, so you buy an insurance policy that covers flood damage.

Avoided

Mitigated

Transferred

Accepted

4. The manufacturer issues a warning that the safety equipment you are using has a small but nonzero probability of failure under the conditions that you'll be facing. You replace it with more appropriate equipment.

Avoided

Mitigated

Transferred

Accepted

5. A mud slide would be very damaging to your project, but there's nothing you can do about it.

Avoided

Mitigated

Transferred

Accepted

6. A team member discovers that the location you planned on using is in a county that is considering regulations that could be expensive to comply with. You work with a surveying team to find a new location.

Avoided

Mitigated

Transferred

Accepted

7. Surrounding geological features could interfere with your communications equipment, so you bring a flare gun and rescue beacon in case it fails.

Avoided

Mitigated

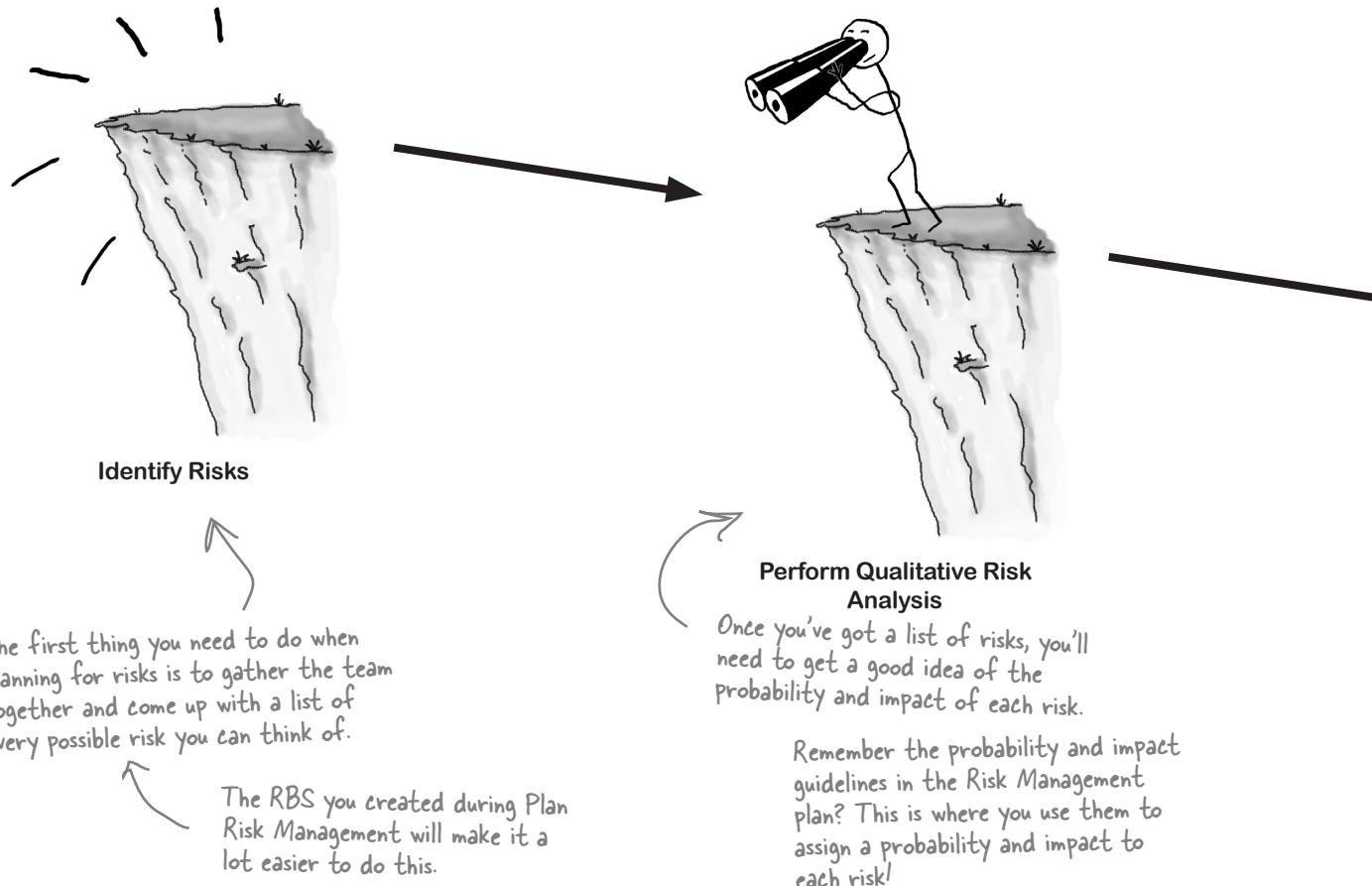
Transferred

Accepted

Answers: 1—Mitigated 2—Mitigated 3—Transferred 4—Accepted 5—Accepted 6—Avoided 7—Mitigated

Anatomy of a risk

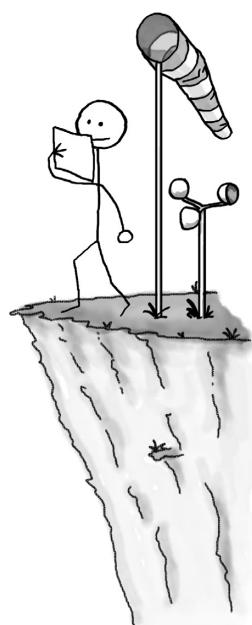
Once you're done with Plan Risk Management, there are four more Risk Management processes that will help you and your team come up with the list of risks for your project, analyze how they could affect it, and plan how you and your team will respond if any of the risks materialize when you're executing it.



There are two more Risk Management processes. You already saw Plan Risk Management. There's also a Monitoring and Controlling process called Monitor Risks that you use when a risk actually materializes.

By the time you get here, you've got a list of risks, with a probability and impact assigned to each. That's a great starting point, but sometimes you need more data if you want to make good decisions...

All four of these Risk Management processes are in the Planning process group—you need to plan for your project's risks before you start executing the project.



Perform Quantitative Risk Analysis

You can make better decisions with more precise data. That's what this process is about—assigning numerical values for the probability and impact of each risk.



Some teams do Perform Qualitative Risk Analysis first, while others start with Perform Quantitative Risk Analysis. Some do only one or the other. Can you think of reasons they might do this?

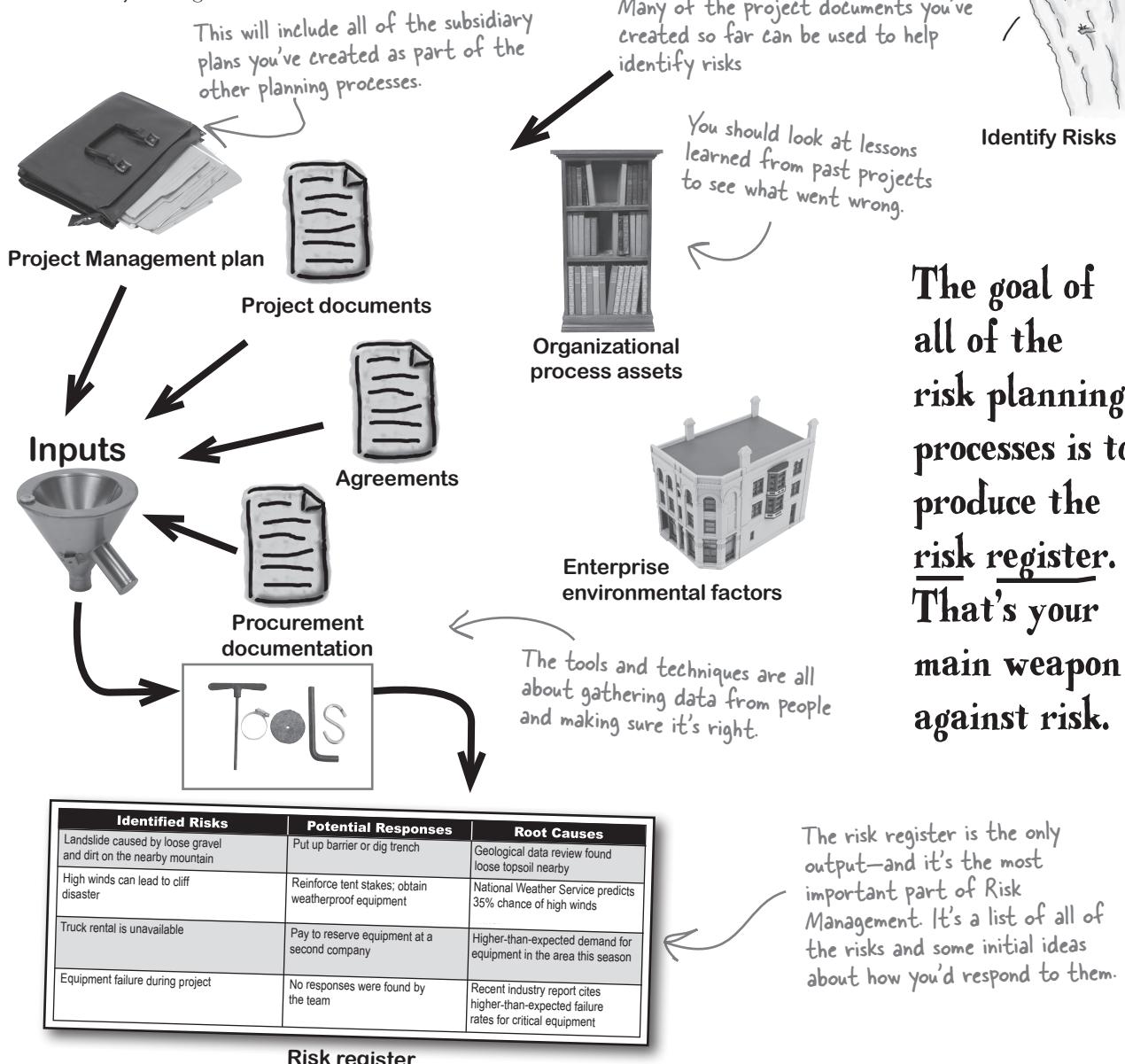
All that's left now is to plan responses to each risk! This is where you decide whether to avoid, mitigate, transfer, or accept...and how you'll do it!



Plan Risk Responses

What could happen to your project?

You can't plan for risks until you've figured out which ones you're likely to run into. That's why the next Risk Management process is **Identify Risks**. The idea is that you want to figure out every possible risk that might affect your project. Don't worry about how unlikely the risk is, or how bad the impact would be—you'll figure that stuff out later.



Data-gathering techniques for Identify Risks

You probably already guessed that the goal of Identify Risks is to identify risks—seems pretty obvious, right? And the most important way to identify those risks is to gather data from the team. That's why the first—and most important—technique in Identify Risks is called **data-gathering techniques**. These are time-tested and effective ways to get data from your team, stakeholders, and anyone else who might have data on risks.



Useful data-gathering techniques

There are a lot of different ways that you can find risks on your project. But there are only a few that you're most likely to use—and those are the ones that you will run across on the exam.

Brainstorming is the first thing you should do with your team. Get them all together in a room, and start pumping out ideas. Brainstorming sessions always have a **facilitator** to lead the team and help turn their ideas into a list of risks.

The facilitator is really important—without her, it's just a disorderly meeting with no clear goal.

The team usually comes up with risks that have to do with building the product, while the sponsor or someone who would use the product will think about how it could end up being difficult to use.

Interviews are a really important part of identifying risk. Try to find everyone who might have an opinion and ask them about what could cause trouble on the project. The sponsor or client will think about the project in a very different way than the project team.



Checklist analysis means using checklists that you developed specifically to help you find risks. Your checklist might remind you to check certain assumptions, talk to certain people, or review documents you might have overlooked.

The RBS you created in Plan Risk Management is a good place to start for this. You can use all the risks you categorized in it as a jumping-off point.



What's the big difference between brainstorming and the interviews? Can you think of a situation where one would be more useful than the other?

More Identify Risks techniques

Even though gathering data is the biggest part of Identify Risks, it's not the only part of it. There are other tools and techniques that you'll use to make sure that the risk register you put together lists as many risks as possible. The more you know about risk going into the project, the better you'll handle surprises when they happen. And that's what these tools and techniques are for—looking far and wide to get every risk possible.

Data analysis tools and techniques

Document analysis is when you look at plans, requirements, documents from your organizational process assets, and any other relevant documents that you can find to squeeze every possible risk out of them.

SWOT analysis lets you analyze strengths, weaknesses, opportunities, and threats. You'll start by brainstorming strengths and weaknesses, and then examine the strengths to find opportunities, and the weaknesses to identify threats to the project.

Root-cause identification is analyzing each risk and figuring out what's actually behind it. Even though falling off of the cliff and having your tent blow away are two separate risks, when you take a closer look you might find that they're both caused by the **same thing**: high winds, which is the root cause for both of them. So you know that if you get high winds, you need to be on the lookout for *both* risks!

Assumptions and constraint analysis

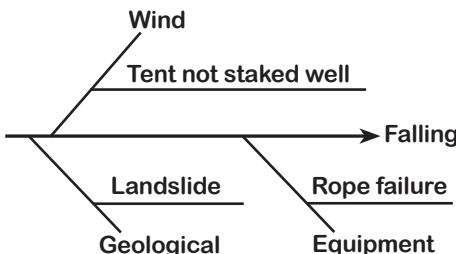
Assumptions and constraint analysis is what you're doing when you look over your project's assumptions. Remember how important assumptions were when you were estimating the project? Well, now it's time to look back at the assumptions you made and make sure that they really are things you can assume about the project. Wrong assumptions are definitely a risk.

Interpersonal and team skills help the team to get broad participation in risk identification. Specifically, the **facilitation** skill is important to this process.

Prompt lists are lists of risk categories that you and the team use to jog your memory when you're identifying risks. You might use the risk categories from the lowest level of the risk breakdown structure to get the team started thinking about risks that could occur on your project as an example.

Expert judgment lets you rely on past experience to identify risks.

Meetings are where your team gets together to identify risks as a group.



Fishbone or Ishikawa diagram



Read each of these scenarios and identify which tool or technique is being used. If a scenario uses a data-gathering technique, specify which one.

1. Your project requires that you set up a campsite on the edge of a cliff. You gather your team members—including a geologist, a meteorologist, a tracker, and three campsite workers—and lead them in a directed discussion where they identify as many risks as possible.
 2. You look through your company's asset library and discover that two previous projects involved setting up camp in this area. You look through the lessons learned to figure out what went wrong, and what could have been avoided through better planning.
 3. You meet individually with many different people: the sponsor, stakeholders, team members, and experts. You ask each of them detailed questions about what they think could go wrong on the project.
 4. You've identified a risk that is very complex, so you try to find out what made it happen. You use an Ishikawa diagram to gain insight into it.
 5. You've reviewed your estimates and find that you had assumed that seasonal weather patterns would hold. If they change, then it could cause serious problems with the project.
-
1. Data-gathering techniques—Brainstorming
 2. Document analysis
 3. Data-gathering techniques—Interviews
 4. Data analysis techniques—Root-cause identification
 5. Data analysis techniques—Assumptions and constraint analysis

Where to look for risks

A good way to understand risks for the exam is to know where they come from. If you start thinking about how you find risks on your project, it will help you figure out how to handle them.

Here are a few things to keep in mind when you're looking for risks:

➊ RESOURCES ARE A GOOD PLACE TO START.

Have you ever been promised a person, equipment, conference room, or some other resource, only to be told at the last minute that the resource you were depending on wasn't available? What about having a critical team member get sick or leave the company at the worst possible time? Check your list of resources. If a resource might not be available to you when you need it, then that's a risk.

➋ "WHEN YOU ASSUME---"

Have you ever heard that old saying about what happens when you assume? At the beginning of the project, your team had to make a bunch of assumptions in order to do your estimates. But some of those assumptions may not actually be true, even though you needed to make them for the sake of the estimate. It's a good thing you wrote them down—now it's time to go back and look at that list. If you find some of them that are likely to be false, then you've found a risk.

➌ THE CRITICAL PATH IS FULL OF RISKS.

Remember the critical path method from Chapter 6? Well, an activity on the critical path is a lot riskier than an activity with plenty of float, because any delay in that activity will delay the project.

If an activity that's not on the critical path has a really small float, that means a small problem could easily cause it to become critical—which could lead to big delays in your project.

➍ LOOK OUTSIDE YOUR PROJECT.

Is there a new rule, regulation, or law being passed that might affect your project? A new union contract being negotiated? Could the price of a critical component suddenly jump? There are plenty of things outside of your project that are risks—and if you identify them now, you can plan for them and not be caught off guard.

Finding risks means talking to your team and being creative. Risks can be anywhere.



These areas are a good start, but there are plenty of other places on your project where you can find risks. Can you think of some of them?

Now put it in the risk register

The point of the Identify Risks process is to...well, identify risks. But what does that really give you? You need to know enough about each risk to analyze it and make good decisions about how to handle it. So when you're doing interviews, leading brainstorming sessions, analyzing assumptions, gathering expert opinions, and using the other Identify Risks tools and techniques, you're gathering exactly the things you need to add to the risk register.

Outputs



Each risk that you and the team come up with should go here.



It's a good idea for your Identify Risks meetings to include a discussion of how to respond to the risks, but you'll really dive into this later in the Plan Risk Responses process.



This is where the results of your root-cause analysis go.



Identified Risks	Potential Responses	Root Causes
Landslide caused by loose gravel and dirt on the nearby mountain	Put up barrier or dig trench	Geological data review found loose topsoil nearby
High winds can lead to cliff disaster	Reinforce tent stakes; obtain weatherproof equipment	National Weather Service predicts 35% chance of high winds
Truck rental is unavailable	Pay to reserve equipment at a second company	Higher than expected demand for equipment in the area this season
Equipment failure during project	No responses were found by the team	Recent industry report cites higher-than-expected failure rates for critical equipment

Risk register

You might discover new risk categories, like Equipment. If you do, you'll go back to the RBS and add them.



Risk report

The other major output of the Identify Risks process is the risk report. As you work through all of the Risk Management process, you'll be compiling a report of the sources of risk to your project and summary-level information.

You'll get a chance to come up with more complete responses later.



Project document updates

Some risks do not have an obvious response.

While you identify risks, you might find changes to your assumption log, issue log, or lessons learned register.

Rank your risks

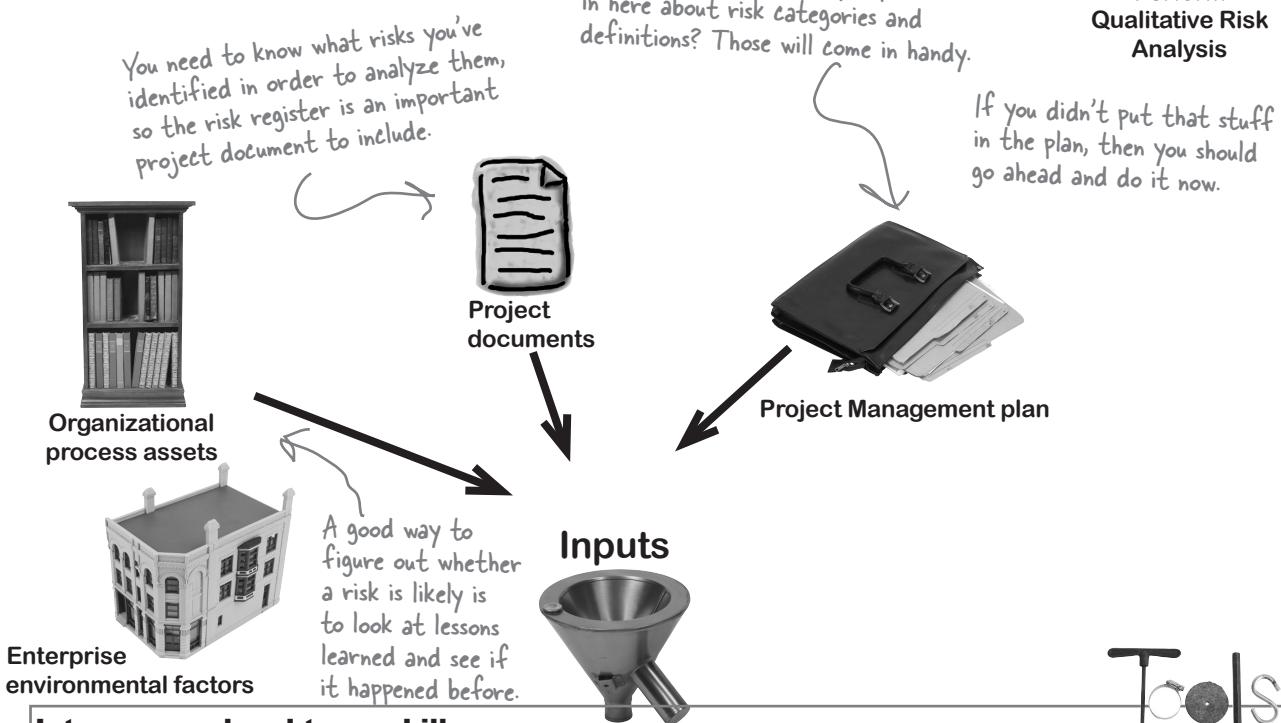


It's not enough to know that risks are out there. You can identify risks all day long, and there's really no limit to the number of risks you can think of. But some of them are likely to occur, while others are very improbable. It's the ones that have much better odds of happening that you really want to plan for.

Besides, some risks will cause a whole lot of damage to your project if they happen, while others will barely make a scratch...and you care much more about the risks that will have a big impact. That's why you need the next Risk Management process, **Perform Qualitative Risk Analysis**—so you can look at each risk and figure out how likely it is and how big its impact will be.



Perform Qualitative Risk Analysis



Interpersonal and team skills

facilitation

You already know about

Meetings

← these from earlier processes.

Expert judgment definitely comes in handy when you're assessing risks. Who better to help you come up with things that might go wrong than experts who have been through similar projects before?



Risk categorization is all about grouping your risks so that you can come up with a better strategy for dealing with them. You might group them by the phase of the project where you'll see them, or by the source of the risk. Or you could come up with a bunch of additional categories that would help you to organize your responses better and be ready for the risk if it should happen.



Examine each risk in the register

Not all risks are created equal. Some of them are really likely to happen, while others are almost impossible. One risk will cause a catastrophe on your project if it happens; another will just waste a few minutes of someone's time.

Data gathering

Interviews are a great way to get a sense for how important or likely people think a risk is.

Data analysis

Risk data quality assessment

means making sure that the data you're using in your risk assessment is accurate. Sometimes it makes sense to bring in outside experts to check out the validity of your risk assessment data. Sometimes you can even confirm the quality of the data on your own, by checking some sample of it against other data sources.

Assessment of other risk parameters

is about urgency and criticality of risks. One way to assess these parameters is to check out how soon you're going to need to take care of a particular risk. If a risk is going to happen soon, you'd better have a plan for how to deal with it soon, too.

Data representation

A Probability and Impact matrix is a table where all of your risks are plotted out according to the values you assign. It's a good way of looking at the data so you can more easily make judgments about which risks require a response. The ones with the higher numbers are more likely to happen and will have a bigger impact on your project if they do. So you'd better figure out how to handle those.

Hierarchical charts show how risks relate to each other. Most charts are organized by risk category so that teams can plan risk responses by category as well.

Risk probability and impact

assessment is one of the best ways to be sure that you're handling your risks properly by examining how likely they are to happen, and how bad (or good) it will be if they do. This process helps you assign a probability to the likelihood of a risk occurring, and then figure out the actual cost (or impact) if it does happen. You can use these values to figure out which of your risks need a pretty solid mitigation plan, and which can be monitored as the project goes on.

Sometimes you'll find that some risks have obviously low probability and impact, so you won't put them in the main section of your register. Instead, you can add them to a separate section called the watch list, which is just a list of risks. It'll include risks you don't want to forget about, but which you don't need to track as closely. You'll check your watch list from time to time to keep an eye on things.

Probability	P&I					
	.9	.09	.27	.45	.63	.81
.7	.07	.21	.35	.49	.63	
.5	.05	.15	.25	.35	.45	
.3	.03	.09	.15	.21	.27	
.1	.01	.03	.05	.07	.09	
Impact	.1	.3	.5	.7	.9	



Here are some facts about the cliff project that were uncovered during qualitative analysis. Update the risk register on the facing page with the appropriate information.

Risk	Probability	Impact
1. Landslide	.1	.9
2. Winds	.7	.9
3. No truck	.3	.7
4. Storms	.5	.3
5. Supplies	.1	.5
6. Illness	.1	.7

During the Perform Qualitative Risk Analysis sessions, the team assigned a probability and impact number to each of the risks on the facing page.

Prob. & impact matrix						
Probability	.9	.09	.27	.45	.63	.89
	.7	.07	.21	.35	.49	.63
	.5	.05	.15	.25	.35	.45
	.3	.03	.09	.15	.21	.27
	.1	.01	.03	.05	.07	.09
Impact	.1	.3	.5	.7	.9	

This gives you a good picture of the threshold the company has set for evaluating risks.

You can figure out the priority of each risk based on its probability and impact. Low-priority risks have no shading, medium ones are light gray, and high ones are dark gray.

1. The organizational process assets at your company set a high-priority risk as any risk with a probability and impact score higher than 0.20. Medium-priority risks are those between 0.10 and 0.19, and low-priority are those between 0 and 0.09. Low-priority risks can be monitored on a watch list, but high and medium ones must have a response strategy.

Fill in the missing values in the Priority and Probability columns in the risk register on the right, using the Probability and Impact matrix to figure out which ones are low, medium, or high. For example, we filled in "High" under Priority for row #3 by looking up risk ("No truck") in the first table, finding the probability and impact values, and then using the Probability and Impact matrix. The probability is .3 and the impact is .7, so you can find the corresponding box in the matrix. Since it's dark gray, its priority is high.

2. After analyzing your data, you came up with three risk categories for the project: natural, equipment, and human.

Fill in the missing values in the Category column of the risk register with either "Natural," "Equipment," or "Human." We started you out by filling in a few of them.

3. For this particular project, you'll need the equipment at the start of the project, so any equipment risks are considered high urgency. Natural and human risks are all medium urgency, except for ones that have to do with storms, which you consider low urgency for this project because of limited mitigation potential.

Figure out the whether the urgency for each risk is low, medium, or high and fill in the Urgency column in the risk register.

It's OK for some responses to be blank—you'll fill them in later during the Plan Risk Responses process.



	Identified risks	Potential response	Root cause	Category	Priority	Urgency
1.	Landslide caused by loose gravel and dirt on the nearby mountain	Put up barrier or dig trench	Geological data review found loose topsoil nearby			
2.	High winds can lead to cliff disaster	Reinforce tent stakes; obtain weatherproof equipment	National Weather Service predicts 35% chance of high winds	Natural		Medium
3.	Truck rental is unavailable		Higher-than-expected demand for equipment this season	Equipment	High	
4.	Storms predicted through the first two weeks of project schedule time	Create reserves to account for time lost due to storms	El Niño weather pattern		Medium	Low
5.	Supply shortage if we don't accurately predict food needs		Nearest store is 30 miles away	Equipment		
6.	If someone gets sick, it could be a problem getting medical care	Bring a doctor with us on the project	Nearest hospital is 50 miles away			

Outputs

Qualitative analysis helps you figure out which risks are most important to your project's success. When you've finished your analysis, you should have a risk register that tells you a lot more about what could go wrong.

The only output of Perform Qualitative Risk Analysis is project documents updates—including updates to the risk register.

	Identified risks	Potential response	Root cause	Category	Priority	Urgency
1.	Landslide caused by loose gravel and dirt on the nearby mountain	Put up barrier or dig trench	Geological data review found loose topsoil nearby	Natural	Low	Medium
2.	High winds can lead to cliff disaster	Reinforce tent stakes; obtain weatherproof equipment	National Weather Service predicts 35% chance of high winds	Natural	High	Medium
3.	Truck rental is unavailable		Higher-than-expected demand for equipment this season	Equipment	High	High
4.	Storms predicted through the first two weeks of project schedule time	Create reserves to account for time lost due to storms	El Niño weather pattern	Natural	Medium	Low
5.	Supply shortage if we don't accurately predict food needs		Nearest store is 30 miles away	Equipment	Low	High
6.	If someone gets sick, it could be a problem getting medical care	Bring a doctor with us on the project	Nearest hospital is 50 miles away	Human	Low	Medium

there are no Dumb Questions

Q: Who does Perform Qualitative Risk Analysis?

A: The whole team needs to work on it together. The more of your team members who are helping to think of possible risks, the better off your plan will be. Everybody can work together to think of different risks to their particular part of the work, and that should give an accurate picture of what could happen on the project.

Q: What if people disagree on how to rank risks?

A: There are a lot of ways to think about risks. If a risk has a large impact on your part of the project or your goals, you can bet that it will seem more important to you than the stuff that affects other people in the group. The best way to keep the right perspective is to keep everybody on the team evaluating risks based on how they affect the overall project goals. If everyone focuses on the effect each risk will have on your project's constraints, risks will get ranked in the order that is best for everybody.

Q: Where do the categories come from?

A: You can create categories however you want. Usually, people categorize risks in ways that help them come up with response strategies. Some people use project phase. That way, they can come up with a risk mitigation plan for each phase of a project, and they can cut down on the information they need to manage throughout. Some people like to use the source of the risk as a category. If you do that, you can find mitigation plans that can help you deal with each source separately. That might come in handy if you are dealing with a bunch of different contractors or suppliers and you want to manage the risks associated with each separately.

Q: How do I know if I've got all the risks?

A: Unfortunately, you never know the answer to that one. That's why it's important to keep monitoring your risk register throughout the project. It's important that you are constantly updating it and that you never let it sit and collect dust. You should be looking for risks throughout all phases of your project, not just when you're starting out.

Q: What's the point in even tracking low-priority risks? Why have a watch list at all?

A: Actually, watch lists are just a list of all of the risks that you want to monitor as the project goes on. You might be watching them to see if conditions change and make them more likely to happen. By keeping a watch list, you make sure that all of the risks that seem low priority when you are doing your analysis get caught before they cause serious damage if they become more likely later in the project.

The conditions that cause a risk are called **triggers**. So, say you have a plan set up to deal with storms, and you know that you might track a trigger for lightning damage, such as a thunderstorm. If there's no thunderstorm, it's really unlikely that you will see lightning damage, but once the storm has started, the chance for the risk to occur skyrockets.

Q: I still don't get the difference between priority and urgency.

A: Priority tells you how important a risk is, while urgency tells you when you need to deal with it. Some risks could be high priority but low urgency, which means that they're really important, but not time-critical. For example, you might know that a certain supplier that provides critical equipment will go out of business in six months, and you absolutely need to find a new supplier. But you have six months to do it. Finding a new supplier is a high priority, because your project will fail if it's not taken care of. But it's not urgent—even if it takes you four months to find a new supplier, nothing bad will happen.

The conditions that cause a risk are called triggers. You use a watch list to stay on top of them.

Qualitative vs. quantitative analysis

Let's say you're a fitness trainer, and your specialty is helping millionaires get ready for major endurance trials. You get paid the same for each job, but the catch is that you get paid only if they succeed. Which of these clients would you take on?

Running a marathon



One client wants you to help him train so that he can finish a marathon. He doesn't have to win, just get to the finish line.

vs.

Climbing Mount Everest



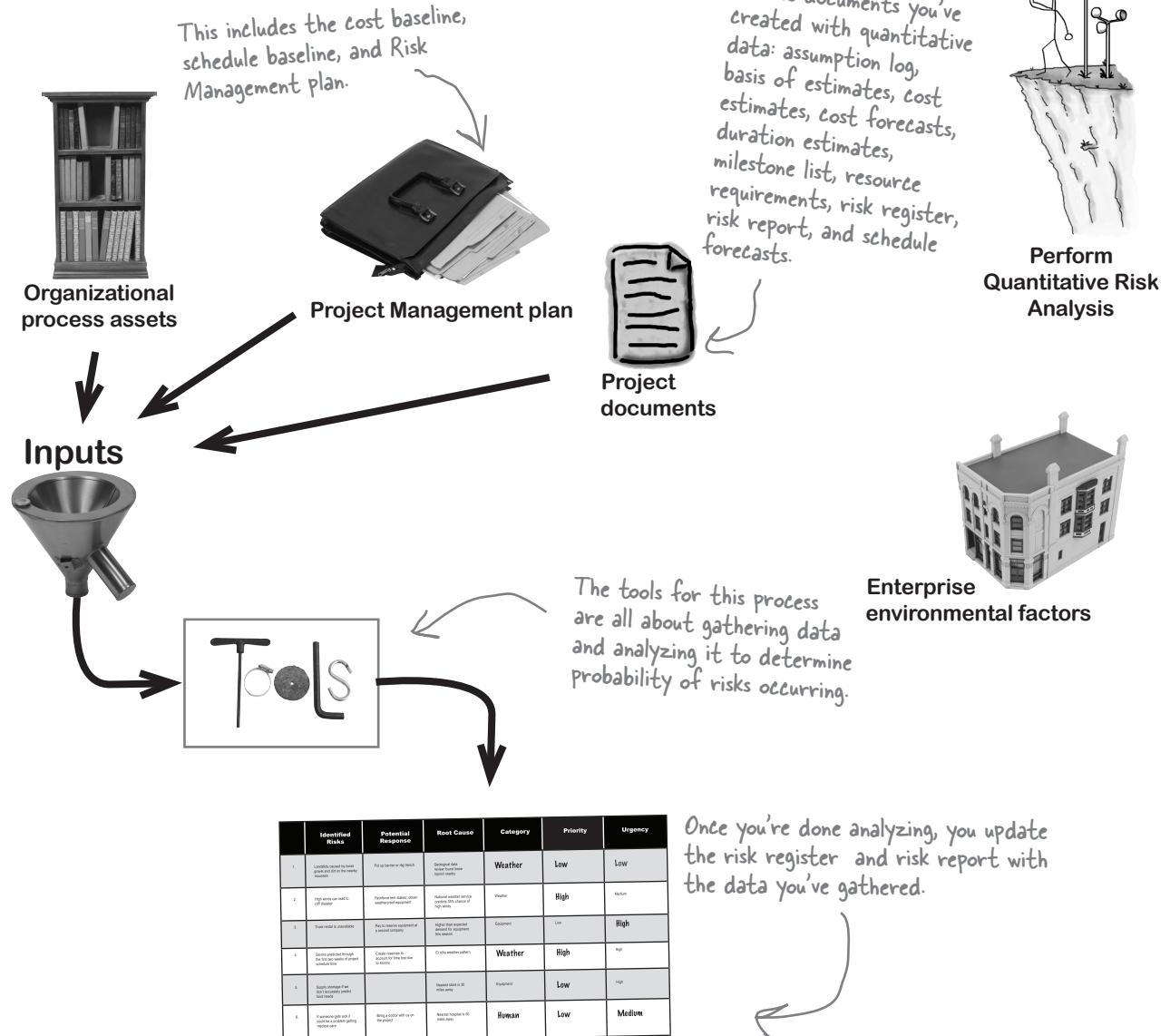
Another client wants you to help him get to the top of Mount Everest. He won't be satisfied unless he gets to the summit.

It's much more likely that you can get even an out-of-shape millionaire to finish a marathon than it is that you can get one to climb Mount Everest successfully.

In fact, since the 1950s, 10,000 people have attempted to climb Mount Everest, and only 1,200 have succeeded, while 200 have died. Your qualitative analysis probably told you that the climbing project would be the *riskier* of the two. But having the numbers to back up that judgment is what quantitative analysis is all about.

Perform Quantitative Risk Analysis

Once you've identified risks and ranked them according to the team's assessment, you need to take your analysis a little further and make sure that the numbers back you up. Sometimes you'll find that your initial assessment needs to be updated when you look into it further.



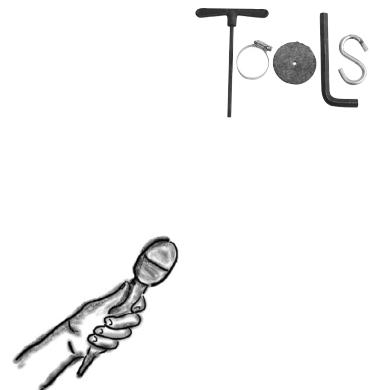
Once you're done analyzing, you update the risk register and risk report with the data you've gathered.

First gather the data...

Quantitative tools are broken down into three categories: the ones that help you get more data about risks, the ones that help you to analyze the data you have, and expert judgment to help you put it all together. The tools for gathering data focus on gathering numbers about the risks you have already identified and ranked. These tools are called **data gathering and representation techniques**.

Interviewing

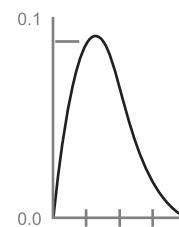
Sometimes the best way to get hard data about your risks is to interview people who understand them. In a risk interview, you might focus on getting three-point cost estimates so that you can come up with a budget range that will help you mitigate risks later. Another good reason to interview is to establish ranges of probability and impact, and document the reasons for the estimates on both sides of the range.



Representations of uncertainty

Sometimes taking a look at your time and cost estimate ranges in terms of their distribution will help you generate more data about them. You probably remember these distribution curves from your probability and statistics classes in school. Don't worry: you won't be asked to remember the formal definition of probability distributions or even to be able to create them. You just need to know that they are another way of gathering data for quantitative analysis.

Beta Distribution



Triangular Distribution



Expert judgment

It's always a good idea to contact the experts if you have access to them. People who have a good handle on statistics or risk analysis in general can be helpful when you are doing quantitative analysis. Also, it's great to hear from anybody who has a lot of experience with the kind of project you are creating.



Interpersonal and team skills: facilitation

You'll need to be skilled at facilitation to help the team come to its quantitative representations of risk. Working with the team while they model out uncertainty and use it to drive decisions is an important part of this process.

...then analyze it

Now that you have all the data you can get about your risk register, it's time to analyze that data. Most of the tools for analyzing risk data are about figuring out how much the risk will end up costing you. There are four tools that fall under the category of **data analysis**: sensitivity analysis, decision tree analysis, simulations, and influence diagrams.

Sensitivity analysis is all about looking at the effect one variable might have if you could completely isolate it. You might look at the cost of a windstorm on human safety, equipment loss, and tent stability without taking into account other issues that might accompany the windstorm (like rain damage or possible debris from nearby campsites). People generally use tornado diagrams to look at a project's sensitivity to just one risk factor.

Decision tree analysis lets you examine costs of all of the paths you might take through the project (depending on which risks occur) and assign a monetary value to each decision. So, if it costs \$100 to survey the cliff and \$20 to stake your tent, choosing to stake your tent *after* you've looked at the cliff has an expected monetary value of \$120. To perform a decision tree analysis, you just diagram out all of the decisions you think you will need to make to deal with risks. Then you add up all that you would need to spend to make each decision.

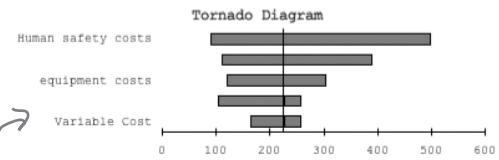
We'll talk about this more in a couple of pages...

Simulation refers to running your project risks through modeling programs. Monte Carlo analysis is one tool that can randomize the outcomes of your risks and the probabilities of them occurring to help you get a better sense of how to handle the risks you have identified.

Influence diagrams

It's valuable to understand the relationships between entities, outcomes, and influences in your project. Influence diagrams show these relationships graphically.

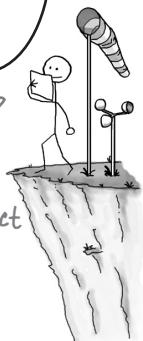
Tools



The tornado diagram lets you look at just one uncertain factor while assuming that all other data will stay where you expect it to.

THE WIND'S BLOWING AT 31 MPH SE. I WEIGH 153 LBS. ACCORDING TO MY SIMULATIONS, I HAVE A 28.3% CHANCE OF FALLING OFF THE CLIFF IN THESE CONDITIONS.

Quantitative analysis means taking measurements and coming up with exact numbers to describe your risks.



This is the same technique you learned about back in Chapter 6.



Monte Carlo analysis lets you run a lot of simulations to come up with data about what could happen on your project.

Calculate the expected monetary value of your risks

OK, so you know the probability and impact of each risk. How does that really help you plan? Well, it turns out that if you have good numbers for those things, you can actually figure out how much those risks are going to cost your project. You can do that by calculating the **expected monetary value** (or EMV) of each risk:



- Start with the probability and impact of each risk.

You can find these
in your risk register.

Risk	Probability	Impact
High winds	35%	costs \$48 to replace equipment
Mudslide	5%	loses \$750 in damage costs
Wind generator is usable	15%	saves \$800 in battery costs
Truck rental unavailable	10%	costs \$350 for last-minute rental

- Take the first risk and multiply the probability by the impact. For opportunities, use a positive cost. For threats, use a negative one. Then do the same for the rest of the risks.

Even though the impact of a mudslide is big, the probability is low so the EMV is small.

$$\text{High winds: } 35\% \times -\$48 = -\$16.80$$

$$\text{Mudslide: } 5\% \times -\$750 = -\$37.50$$

$$\text{Wind generator: } 15\% \times \$800 = \$120.00$$

$$\text{Truck rental: } 10\% \times -\$350 = -\$35.00$$

The wind generator risk is an opportunity because you'll save money if it happens. So when you do the EMV calculation, you use a positive number for the impact.

- Now that you've calculated the EMV for each of the risks, you can add them up to find the total EMV for all of them.

$$\text{EMV} = -\$16.80 + -\$37.50 + \$120.00 + -\$35.00 = \$30.70$$

If you add \$30.70 to the budget, then it should be enough to account for these risks.



You'll need to know how to do EMV calculations for the test. Give them a shot now—they're pretty easy once you get the hang of them.

Take a look at this table of risks.

Risk	Probability	Impact
Navigation equipment failure	15%	costs \$300 due to getting lost
Unseasonably warm weather	8%	saves \$500 in excavation costs
Wild animals eat rations	10%	costs \$100 for replacements

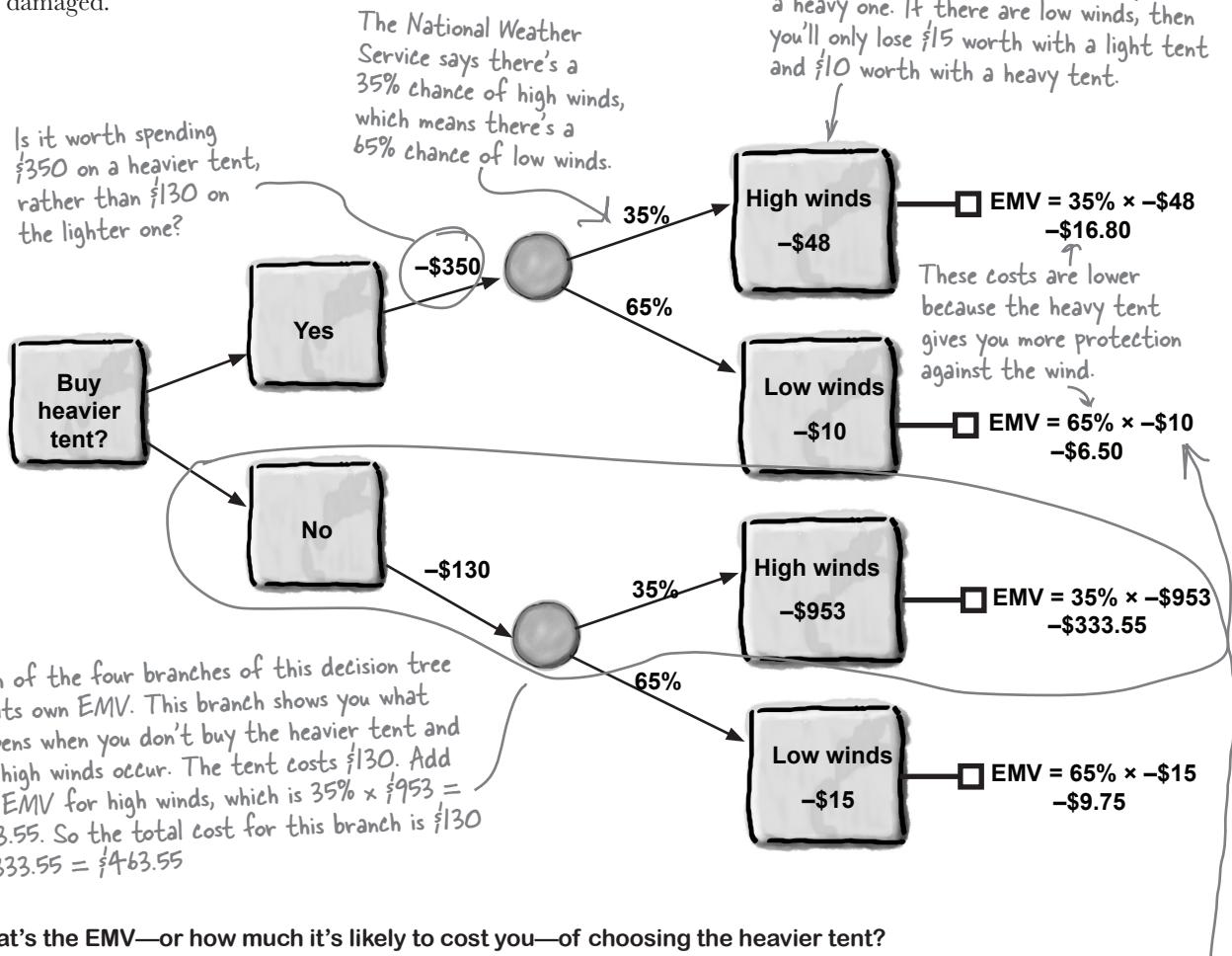
1. Calculate the EMV for each of these three risks.
2. If these are the only risks on the project, calculate the total EMV.
3. The latest weather report came out, and there is now a 20% chance of unseasonably warm weather. What's the new EMV for the project?
4. Now the cost of replacement rations goes up to \$150. What's the new EMV for the project?

—————> Answers on page 628.

Decision tree analysis uses EMV to help you make choices

Tools

There's another way to do EMV—as we mentioned earlier, you can do it visually using a **decision tree**. This decision tree shows the hidden costs of whether or not you buy a heavier tent. The tent is more expensive—it costs \$350, while the lighter tent costs \$130. But the heavier tent has better protection against the wind, so if there are high winds, your equipment isn't damaged.



Each of the four branches of this decision tree has its own EMV. This branch shows you what happens when you don't buy the heavier tent and the high winds occur. The tent costs $\$130$. Add the EMV for high winds, which is $35\% \times \$953 = \333.55 . So the total cost for this branch is $\$130 + \$333.55 = \$463.55$

What's the EMV—or how much it's likely to cost you—of choosing the heavier tent?

If we add the EMV for high winds plus the EMV for low winds to the cost of the tent, we'll figure out the "real" cost of choosing the heavier tent. So that's $-\$16.80 + -\$6.50 + -\$350 = -\373.30 .

Compare that with the EMV of choosing the lighter tent. Which decision makes sense?

We can do the same thing for the bottom two branches of the tree. The "cheaper" tent costs $-\$130 + -\$333.55 + -\$9.75 = -\473.30 . So it's actually more expensive!

This is just the EMV of the low winds if you buy the heavier tent. The probability of low winds is 65%, and the cost is $\$10$. So it's just like the other EMV calculations: $65\% \times -\$10 = -\6.50 .



Exercise

Looking at the decision tree on the facing page, see if you can figure out the expected monetary value depending on the decisions the team makes.

Hint: Figure out the new EMV for each branch—that will tell you if the decision makes sense.

1. You hear a weather report that says there's now a 45% chance of high winds. Does it still make sense to buy the heavier tent?

2. If you don't buy the heavier tent, then you have room to take along a wind generator that can power your equipment, and that will save you \$1,100 in portable batteries if there's a heavy wind. If there's still a 45% chance of high winds, does it still make sense to buy the heavier tent?

→ Answers on page 629.

This is an opportunity. So it should have a **POSITIVE** value when you do the EMV calculation.

^{there are no} Dumb Questions

Q: I still don't get this Monte Carlo stuff. What's the deal?

A: All you really need to know about Monte Carlo analysis for the test is that it's a way that you can model out random data using software. In real life, though, it's a really cool way of trying to see what could happen on your project if risks do occur. Sometimes modeling out the data you already have about your project helps you to better see the real impact of a risk if it did happen.

Q: I can figure out how much the risk costs using EMV, or I can do it with decision tree analysis. Why do I need two ways to do this?

A: That's a good question. If you take a really careful look at how you do decision tree analysis, you might notice something... it's actually doing exactly the same thing as EMV. It turns out that those two techniques are really similar, except that EMV does it using numbers and decision tree analysis spells out the same calculation using a picture.

Q: I understand that EMV and decision trees are related, but I still don't exactly see how.

A: It turns out that there are a lot of EMV techniques, and decision tree analysis is just one of them. But it's the one you need to know for the test, because it's the one that

helps you make decisions by figuring out the EMV for each option. You can bet that you'll see a question or two that asks you to calculate the EMV for a project based on decision tree like the one on the facing page. As long as you remember that risks are negative numbers and that opportunities are positive ones, you should do fine.

Q: So are both quantitative analysis and qualitative analysis really just concerned with figuring out the impact of risks?

A: That's right. Qualitative analysis focuses on the impact as the team judges it in planning. Quantitative analysis focuses on getting the hard numbers to back up those judgments.

Update the risk register based on your quantitative analysis results

When you've finished gathering data about the risks, you change your priorities, urgency ratings, and categories (if necessary), and you update your risk register. Sometimes modeling out your potential responses to risk helps you to find a more effective way to deal with them. That's why the only output of the **Perform Quantitative Risk Analysis** is **project documents updates**.

Outputs



Analysis showed us that this would be the most expensive risk if it were to occur. So it got upgraded to a high priority.

	Identified risks	Potential response	Root cause	Category	Priority	Urgency
1.	Landslide caused by loose gravel and dirt on the nearby mountain	Put up barrier or dig trench	Geological data review found loose topsoil nearby	Natural	High	Medium
2.	High winds can lead to cliff disaster	Reinforce tent stakes; obtain weatherproof equipment	National Weather Service predicts 35% chance of high winds	Natural	High	Medium
3.	Truck rental is unavailable	Pay to reserve equipment at a second company	Higher-than-expected demand for equipment this season	Equipment	High	High
4.	Storms predicted through the first two weeks of project schedule time	Create reserves to account for time lost due to storms	El Niño weather pattern	Natural	Medium	Low
5.	Supply shortage if we don't accurately predict food needs		Nearest store is 30 miles away	Equipment	Low	High
6.	If someone gets sick, it could be a problem getting medical care	Bring a doctor with us on the project	Nearest hospital is 50 miles away	Human	Low	Low

This one got downgraded when quantitative analysis showed that it was not very likely to happen on such a short-term project.



BULLET POINTS: AIMING FOR THE EXAM

- The main output of all of the Risk Management planning processes is **updated project documents**, and the main document that gets updated is the **risk register**.
- The first step in Risk Management is **Identify Risks**, where you work with the whole team to figure out what risks could affect your project.
- Qualitative and quantitative analysis are all about **ranking risks** based on their probability and impact.
- Qualitative analysis is where you take the **categories** in your risk plan and **assign** them to each of the risks that you've identified.
- Quantitative analysis focuses on **gathering numbers** to help evaluate risks and **making the best decisions** about how to handle them.
- **Decision tree analysis** is one kind of **expected monetary value** analysis. It focuses on adding up all of the costs of decisions being made on a project so that you can see the overall value of risk responses.
- To calculate EMV, be sure to **treat all negative risks as negative numbers** and **all opportunities as positive ones**. Then add up all of the numbers on your decision tree.
- Don't forget **watch lists**. They let you monitor lower-priority risks so that you can see if triggers for those risks occur and you need to treat them as higher priorities.
- All of the processes in Risk Management are **Planning or Monitoring and Controlling processes**. There are **no Executing** processes here. Since the goal is to plan for risks, there is no need to focus on actually doing the work. By then, it's too late to plan for risks.

Your risk register should include both threats and opportunities.

Opportunities have positive impact values, while threats have negative ones. Don't forget the plus or minus sign when you're calculating EMV.



How would you handle the risks listed in the risk register so far?

How do you respond to a risk?

After all that analysis, it's time to figure out what you're going to do if a risk occurs. Maybe you'll be able to keep a reserve of money to handle the cost of the most likely risks. Maybe there's some planning you can do from the beginning to be sure that you avoid it. You might even find a way to transfer some of the risk with an insurance policy.

However you decide to deal with each individual risk, you'll update your risk responses in the risk register to show your decisions when you're done. When you're done with **Plan Risk Responses**, you should be able to tell your change control board what your response plans are and who will be in charge of them so they can use them to evaluate changes.

You've updated your risk register as part of all of your analysis so far. It should contain everything you know about the risks facing your project, and even some preliminary responses you might have thought of along the way.

Some other documents you might use for this process: lessons learned register, project schedule, project team assignments, resource calendars, risk report, and the stakeholder register.

Identified Risks	Potential Impact	Impact Score	Category	Priority	Urgency
Risk 1	Medium	Medium	Weather	Low	Low
Risk 2	High	Medium	Health	Medium	Medium
Risk 3	Medium	Medium	Technology	Medium	Medium
Risk 4	Medium	Medium	Market	Medium	Medium
Risk 5	Medium	Medium	Team	Medium	Medium
Risk 6	Medium	Medium	Scope	Medium	Medium
Risk 7	Medium	Medium	Cost	Medium	Medium

Project documents

Project Management plan

This includes the Resource Management plan, Risk Management plan, and cost baseline.



Organizational process assets



Project documents



Enterprise environmental factors

Inputs



Planning process group



Plan Risk Responses

Plan Risk Responses is figuring out what you'll do if risks happen.

Tools

Expert judgment

You might need to reach out to somebody who has dealt with a risk you've identified before to understand the best way to respond to it.

Contingent response strategies

Sometimes you need to make contingency plans in case an event occurs in your project. Say you miss an important milestone or a vendor you're depending on goes out of business. You might put together a plan that would be triggered by that event to keep your project on track.

Data gathering: interviews

Interviewing stakeholders to get their opinions on the best way to respond to specific risks is a great way to put together a risk response plan.

Decision making

Interpersonal and team skills: facilitation

Data analysis: alternatives analysis and cost-benefit analysis

You know these data analysis techniques already. They can help you figure out the best way to respond to the risks you've identified.

It isn't always so bad

Remember the strategies for handling negative risks—avoid, mitigate, transfer, accept, and escalate—from earlier? Well, there are strategies for handling positive risks, too. The difference is that **strategies for opportunities** are all about how you can try to get the most out of them. The strategies for handling negative and positive risks are the tools and techniques for the Plan Risk Responses process.



The strategies for threats are also tools and techniques for this process. They're the ones you already learned: avoid, mitigate, transfer, accept, and escalate.

1 Exploit

This is when you do everything you can to make sure that you take advantage of an opportunity. You could assign your best resources to it. Or you could allocate more than enough funds to be sure that you get the most out of it.

2 Share

Sometimes it's harder to take advantage of an opportunity on your own. Then you might call in another company to share in it with you.

3 Enhance

This is when you try to make the opportunity more probable by influencing its triggers. If getting a picture of a rare bird is important, then you might bring more food that it's attracted to.

4 Accept

Just like accepting a negative risk, sometimes an opportunity just falls in your lap. The best thing to do in that case is to just accept it!

5 Escalate

If you found an opportunity that might help your overall company strategy beyond what your project set out to do, you might escalate that opportunity to people who could take advantage of it.

which response strategy?

In this exercise, you'll explore strategies
for overall project risk, an important
tool/technique of Plan Risk Responses.



* WHAT'S MY PURPOSE *

Another tool of Plan Risk Responses is strategies for overall project risk, and it involves planning different risk responses based on the risk potentially faced by the project. Each of the techniques below is a different way project teams can handle risk. Can you figure out which risk response technique is being used in these situations? Match each technique to its scenario.

Mitigate

If the weather's good, then there's a chance you could see a meteor shower. If the team gets a photo that wins the meteor photo contest, you can get extra funding. You have your team stay up all night with their telescopes and cameras ready.

Avoid

You hear that it's going to rain for the first three days of your trip, so you bring waterproof tents and indoor projects for the team to work on in the meantime.

Accept

You read that there's a major bear problem in the spring on the cliff where you are planning to work. You change your project start date to happen in the fall.

Transfer

On your way up the cliff, you meet another team that is looking to survey the area. You offer to do half of the surveying work while they do the other half and then trade your findings with each other.

Exploit

There's a high probability of water damage to some of your equipment, so you buy insurance to avoid losses.

Share

There's always the chance that someone could make a mistake and fall off the cliff. No matter how much you plan for the unexpected, sometimes mistakes happen.

Enhance

About 10 years ago a really rare bird, the black-throated blue warbler, was seen on this cliff. If you could get a picture of it, it would be worth a lot of money. So, you bring special seeds that you have read are really attractive to this bird, and you set up lookout points around the cliff with cameras ready to get the shot.

—————> **Answers on page 630.**

Add risk responses to the register

It's time to add—you guessed it—more updates to project documents, including the risk register. All of your risk responses will be tracked through change control. Changes that you need to make to the plan will get evaluated based on your risk responses, too. It's even possible that some of your risk responses will need to be added into your contract.

Every risk needs to have one person who owns the response plan.



During Plan Risk Responses, the team agreed to buy insurance for this one.

	Identified risks	Response strategy	Root cause	Risk owner	Cat	Priority	Urgency
1.	Landslide caused by loose gravel and dirt on the nearby mountain	Put up barrier or dig trench	Geological data review found loose topsoil nearby	Joe S.	Natural	High	Medium
2.	High winds can lead to cliff disaster	Reinforce tent stakes; obtain weatherproof equipment	National Weather Service predicts 35% chance of high winds	Tanya T.	Natural	High	Medium
3.	Truck rental is unavailable	Pay to reserve equipment at a second company	Higher-than-expected demand for equipment this season	Joe S.	Equipment	High	High
4.	Storms predicted through the first two weeks of project schedule time	Buy storm insurance in case the equipment is damaged	El Niño weather pattern	Michael R.	Natural	Medium	Low
5.	Supply shortage if we don't accurately predict food needs		Nearest store is 30 miles away	James S.	Equipment	Low	High
6.	If someone gets sick, it could be a problem getting medical care	Bring a doctor with us on the project	Nearest hospital is 50 miles away	Tanya T.	Human	Low	Low
7.	Someone could fall in the landslide trench	Set up a trench patrol to make sure no one gets hurt	Dig trench for landslides	Joe S.	Human	Low	Low



Project Management plan updates

The PM plan needs to be updated so that integrated change control can include the risk responses.



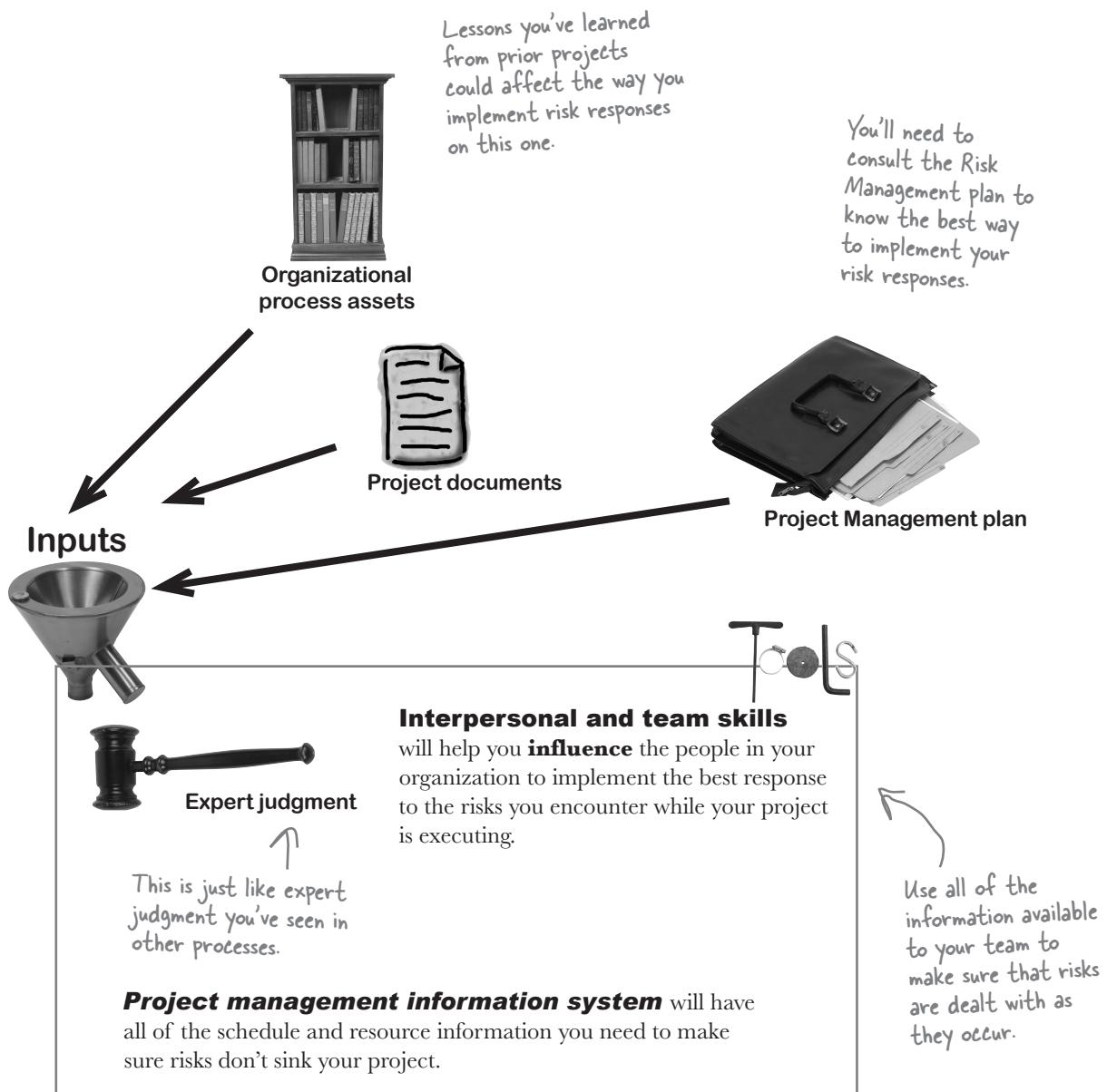
Project documents updates



Change requests

Implement Risk Responses

Now that you've planned responses to risk, you're ready to put that plan into action. The next process, **Implement Risk Responses**, is all about what you do when you run into an occurrence of the risks you've identified. This is where you actually respond to the risk by doing what's in your plan.



Outputs

Changes to the plan will always need to go through change control.



Change requests

As you implement your risk responses, make sure project documents are updated to include the new information you uncover.



Project documents updates

As you respond to risk, you update your project documents

Think about all of the documents that might need to change as you put your risk responses into action. You might identify new issues that need to be added to the issue log. Or, you could learn something new from a risk that you encounter and need to make an update to the lessons learned register. You could need to change the way your team is assigned in order to respond to a risk that happens. There's always the possibility that you could need to change the risk register and the risk report themselves as you learn more about the risks you've planned for.

Risk response can find even more risks

Secondary risks come from a response you have to another risk. If you dig a trench to stop landslides from taking out your camp, it's possible for someone to fall into the trench and get hurt.

Residual risks remain after your risk responses have been implemented. So even though you reinforce your tent stakes and get weatherproof gear, there's still a chance that winds could destroy your camp if they are strong enough.



Why do you think expert judgment is a tool for the Implement Risk Responses process?



Risk Management Exposed

This week's interview:
Stick figure who hangs out on cliffs

Head First: We've seen you hanging out on cliffs for a while now. Apparently, you've also been paying people to stand on the cliff for you, or getting a friend to hold a trampoline at the foot of the cliff; we've even seen you jump off of it. So now that I've finally got a chance to interview you, I want to ask the question on everyone's mind: "Are you insane? Why do you spend so much time up there?"

Stick Figure: First off, let me dispel a few myths that are flying around out there about me. I'm not crazy, and I'm not trying to get myself killed! Before Risk Management entered my life I, like you, would never have dreamed of doing this kind of thing.

Head First: OK, but I'm a little skeptical about your so-called "Risk Management." Are you trying to say that because of Risk Management you don't have to worry about the obvious dangers of being up there?

Stick Figure: No. Of course not! That's not the point at all. Risk Management means you sit down and make a list of all of the things that could go wrong. (And even all the things that could go right.) Then you really try to think of the best way to deal with anything unexpected.

Head First: So you're doing this Risk Management stuff to make it less dangerous for you?

Stick Figure: Yes, exactly! By the time I'm standing up there on that cliff, I've really thought my way through pretty much everything that might happen up there. I've thought through it both qualitatively and quantitatively.

Head First: Quantitatively?

Stick Figure: Yes. You don't think I'd go up there without knowing the wind speed, do you? Chance of landslides? Storms? The weight of everything I'm carrying? How likely I am to fall in weather conditions? I think about all of that and I measure it. Then I sit down and come up with risk response strategies.

Head First: OK, so you have strategies. Then what?

Stick Figure: Then I constantly monitor my risks while I'm on the cliff. If anything changes, I check to see if it might trigger any of the risks I've come up with. Sometimes I even discover new risks while I'm up there. When I do, I just add them to the list and work on coming up with responses for them.

Head First: I see. So you're constantly updating your list of risks.

Stick Figure: Yes! We call it a **risk register**. Whenever I have new information, I put it there. It means that I can actually hang out on these cliffs with a lot of confidence. Because, while you can't guarantee that nothing will go wrong, you can be prepared for whatever comes your way.

Head First: That's a lot of work. Does it really make a difference?

Stick Figure: Absolutely! I'd never be able to sleep at night knowing that I could fall off the cliff at any time. But I've planned for the risks, and I've taken steps to stay safe...and I sleep like a baby.



You can't plan for every risk at the start of the project

Even the best planning can't predict everything—there's always a chance that a new risk could crop up that you hadn't thought about. That's why you need to constantly monitor how your project is doing compared to your risk register. If a new risk happens, you have a good chance of catching it before it causes serious trouble. When it comes to risk, the earlier you can react, the better for everybody. And that's what the **Monitor Risks** process is all about.

Identified Risks	Potential Response	Root Cause	Risk Owner	Cat	Priority	Urgency
1. Landowner refused to let our group camp and did not renew their lease.	Put up barrier or dig trench.	Landowner didn't renew their lease recently.	Joe S.	Weather	High	Low
2. High winds often last to till season.	Reduce tent height and use weatherproof equipment.	National weather service says there is a 35% chance of high winds.	Tanya T.	Weather	High	Medium
3. Truck rental is unreliable.	Pay to reserve truck with a second company.	More than expected demand for truck rentals this season.	Joe S.	Equipment	Low	High
4. Storms delayed shipping of the last two weeks of equipment due to port strike.	Buy insurance to compensate in case the equipment is damaged.	Bad weather pattern.	Mikhail K.	Weather	High	High
5. Supply shortage if we don't economy pedic load truck.	Measure stored in 20 miles away.	James C.	Equipment	Low	High	
6. If someone gets sick we don't have problem getting medical care.	Bring a doctor with us on the project.	Newer hospital is 50 miles away.	Tanya T.	Human	Low	Low
7. Someone could fall into the surrounding trench.	Set up a fence.	Dig trench for bridge.	Joe S.	Human	Low	Low

The park ranger's come by to let you know about some recent bear sightings on this cliff.



The risk register doesn't say anything about handling bears. Looks like this is a new risk altogether...

Monitor Risks is another change control process

Risk responses are treated just like changes. You monitor the project in every status meeting to see how the risks in the risk register are affecting it. If you need to implement a risk response, you take it to your change control board, because it amounts to a change that will affect your project constraints.

You compare all of your actual data to your plans using the risk register and the PM plan.



Project Management plan

Impact	Probability	Impact	Probability	Impact	Probability	Impact	Probability
Low	Low	Medium	Medium	High	High	Very High	Very High
Low	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Medium	High	Medium	High	Medium	High	Medium	High
High	High	High	High	Very High	High	Very High	High
Very High	Very High						

Project documents

Inputs



Work performance data



Work performance reports

You should keep monitoring your risks at every meeting until the project is closed.

That's why the tools and techniques include status meetings.

You should review status reports, metrics, and other work outputs to see if risks are happening.



Risk monitoring should be done at every status meeting.

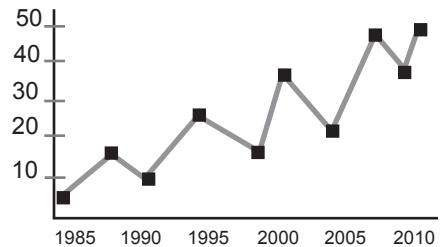


How to monitor your risks

Monitoring risks means keeping your finger on the pulse of the project. If you are constantly reviewing all of the data your project is producing, you will be able to react quickly if a new risk is uncovered, or if it looks like one of your response strategies needs to spring into action. Without careful monitoring, even your best plans won't get implemented in time to save your project if a risk happens. Here are the **data analysis techniques** you'll need to use when you monitor your risks.

Technical performance analysis

Comparing the actual project performance to the plan is a great way to tell if a risk might be happening. If you find that you're significantly over budget or behind schedule, a risk could have cropped up that you didn't take into account. Looking for trends in your defects or schedule variance, for example, might show patterns that indicate that risks have occurred before you would have found that out on your own.



Reserve analysis

Just like you keep running tabs on your budget, you should always know how much money you have set aside for risk response. As you spend it, be sure to subtract it so you know if you have enough to cover all of your remaining risks. If you start to see that your reserves are running low and there are still a lot of risks being identified, you might be in trouble. Keeping tabs on your reserves means that you will always know if you need to set aside more funds or make different choices about how to handle risks as they come up.



Sometimes this kind of reserve is called a "contingency"—because its use is contingent on a certain risk happening.

Analyze the data you gather in project status meetings to determine how your project is managing risk.

More control risk tools and techniques

There are just a few more tools in the **Monitor Risks** process. They're all focused on finding new risks if they crop up, dealing with changes to the risks you've already planned for, and responding quickly to risks you know how to handle.



Audits are when you have an outside party come in and take a look at your risk response strategies to judge how effective they are. Sometimes risk audits will point out better ways of handling a specific risk so that you can change your response strategy going forward.



Auditors will also look at how effective your overall processes for risk planning are.

Meetings are the most important way to keep the team up to date on risk planning—so important that **they should happen throughout the entire project**. The more you talk about risks with the team, the better. Every single status meeting should have risk review on the agenda. Status meetings are a really important way of noticing when things might go wrong, and of making sure that you implement your response strategy in time. It's also possible that you could come across a new opportunity by talking to the team.



Never stop looking for new risks and adapting your strategies for dealing with them.



Exercise

Here are some risk monitoring and control activities. Can you determine which of the tools is being used in each one?

1. At every milestone, you do a new round of Identify Risks and make sure that the risks in your risk register still apply to the project.

- Meetings
- Audit
- Technical performance analysis
- Reserve analysis

2. You check to make sure that you have all of the features developed in your project that you had planned when you reach the “feature complete” milestone. When you find that you are missing one of the planned features, you realize that a new risk has shown up—you missed one of the required features in your functional specification.

- Meetings
- Audit
- Technical performance analysis
- Reserve analysis

3. You take a look at the number of defects you have found in your project per phase and find that it is higher in your project than it has been in most other projects that the company is doing. You dig a little deeper and find some previously unplanned risks that have been causing trouble on your project.

- Meetings
- Audit
- Technical performance analysis
- Reserve analysis

4. Your company sends a risk expert in to take a look at your risk response strategies. She finds that you are missing a few secondary risks that might be caused by the responses you have planned. So you update your risk register to include the secondary risks.

- Meetings
- Audit
- Technical performance analysis
- Reserve analysis

- 5 You decide to implement a risk response that costs \$4,000. You check to make sure that you have enough money to cover the rest of the risks that might happen from here on out in the project.

- Meetings
- Audit
- Technical performance analysis
- Reserve analysis

5—Reserve analysis

4—Audit

3—Technical performance analysis

2—Technical performance analysis

1—Meetings

Answers:

there are no Dumb Questions

Q: Why do I need to ask about risks at every status meeting?

A: Because a risk could crop up at any time, and you need to be prepared. The better you prepare for risks, the more secure your project is against the unknown. That's also why the triggers and watch lists are really important. When you meet with your team, you should figure out if a trigger for a risk response has happened. And you should check your watch list to make sure none of your low-priority risks have materialized.

For the test, you need to know that status meetings aren't just a place for you to sit and ask each member of your team to tell you his or her status. Instead, you use them to figure out decisions that need to be made to keep the project on track or to head off any problems that might be coming up. In your status meetings, you need to discuss all of the issues that involve the whole team and come up with solutions to any new problems you encounter. So, it makes sense that you would use your status meetings to talk about your risk register and make sure that it is always up to date with the latest information.

Q: I still don't get technical performance analysis. How does it help me find risks?

A: It's easy to miss risks in your project—sometimes all the meetings in the world won't help your team see some of them. That's why a tool like trend analysis can be really useful. Remember the control chart from Chapter 8? This is really similar, and it's just as valuable. It's just a way to see if things are happening that you did not plan for.

Q: Hey, didn't you talk about risks back in the Project Schedule Management chapter too?

A: Wow—it's great that you remembered that! The main thing to remember about risks from Chapter 6 is that having a very long critical path or, even worse, multiple critical paths, means you have a riskier project. The riskiest is when all of the activities are on the critical path. That means that a delay to even one activity can derail your whole project.

Q: Shouldn't I ask the sponsor about risks to the project?

A: Actually, the best people to ask about risks are the project team itself. The sponsor knows why the project is needed and how much money is available for it, but from there, it's really up to the team to manage risks. Since you are the ones doing the work, it makes sense that you would have a better idea of what has gone wrong on similar projects and what might go wrong on this one. Identify Risks, Perform Qualitative and Quantitative Risk Analysis, and Plan Risk Responses are some of the most valuable contributions the team makes to the project. They can be the difference between making the sponsor happy and having to do a lot of apologizing.

Q: Why do we do risk audits?

A: Risk audits are when you have someone from outside your project come in and review your risk register—your risks and your risk responses—to make sure you got it right. The reason we do it is because risks are so important that getting a new set of eyes on them is worth the time.

Q: Hold on, didn't we already talk about reserves way back in the Cost Management chapter? Why is it coming up here?

A: That's right, back in Chapter 7 we talked about a **management reserve**, which is money set aside to handle any unknown costs that come up on the project. That's a different kind of reserve than the one for controlling risks. The kind of reserve used for risks is called a **contingency reserve**, because its use is *contingent* on a risk actually materializing.

Project managers sometimes talk about both kinds of reserves together, because they both have to show up on the same budget. When they do, you'll sometimes hear talk of "known unknowns" and "unknown unknowns." The management reserve is for unknown unknowns—things that you haven't planned for but could impact your project. The contingency reserve is for known unknowns, or risks that you know about and explicitly planned for and put in your risk register.

**The better you
prepare for risks,
the more secure
your project
is against the
unknown.**



Outputs



You'll find all sorts of things that need to be fixed. But you can't just go update the plan—you need this as an input to kick off change control.)

By now, you know what comes out of a typical Monitoring and Controlling process. Draw in the missing outputs for Monitor Risks.

Identified Risk	Potential Impact	Root Cause	Bulk Owner	Cat	Priority	Urgency
1. Landfill owner didn't do the research and don't care about the environment.	Put up barrier or dig trench	Geographic data shows topsoil layer has high water content.	Joe S	Weather	High	Low
2. High winds can lead to cliff erosion.	Reservoir tank, erosion control equipment.	National weather service predicts high pressure system with high winds.	Sally T	Weather	High	Medium
3. Trustee needs to understand the project.	Pay to reschedule a second company.	Higher than expected costs due to equipment hire.	Joe S	Equipment	Low	High
4. Discuss vendor through the first half of the project schedule.	Buy alarm system to prevent the equipment from being damaged.	Ex jobs weather pattern.	Michael M	Weather	High	High
5. Supply strategy will affect the economy predict future outcomes.	Bring a doctor with it if it could be a medical emergency.	Nearest store is 20 miles away.				
6. If someone gets sick it could be a medical emergency.	Set up a health clinic on the project.	Hospital hospital is 50 miles away.				
7. Someone could fall and break their arm.	Set up a health clinic on the project.	Dry trench for safety.	Joe E.	Health	Low	Low

Monitor Risks

This one's all about helping others to learn from what's happened on your project.



Work performance information

This set of documents needs to be updated any time your plans change.

For this one, think about what you do once you have evaluated work performance information and found that something needs to happen.

Sharpen your pencil Solution

Outputs



By now, you know what comes out of a typical Monitoring and Controlling process. Draw in the missing outputs for Monitor Risks.

Identified Risk	Potential Impact	Root Cause	Bulk Owner	Cat	Priority	Urgency
1. Landscaping crews did not do the work and did not clean up after it.	Put up barrier or dig trench	Geographic data shows topographic changes.	Joe S	Weather	High	Low
2. High winds can lead to cliff erosion.	Residence test market, observe equipment.	National weather service predicts high pressure system with high winds.	Sally T	Weather	High	Medium
3. Trustee needs are unpredictable.	Pay to trustee to hire a second company.	Higher than expected costs.	Joe S	Equipment	Low	High
4. Direct vendor through the first level of supply chain project schedule will be late.	Buy from another supplier if the equipment is damaged.	Global weather patterns.	Michael U	High	High	High
5. Supply manager said it could be a problem getting medical care.	Bring a doctor with on the project.	Hospital store is 20 miles away.				
6. If someone gets sick it could be a problem getting medical care.	Set up a health insurance plan so one gets hurt.	Hospital hospital is 50 miles away.				
7. Someone could fall and break a bone while trenching.	Buy trench for safety.	Joe E.				

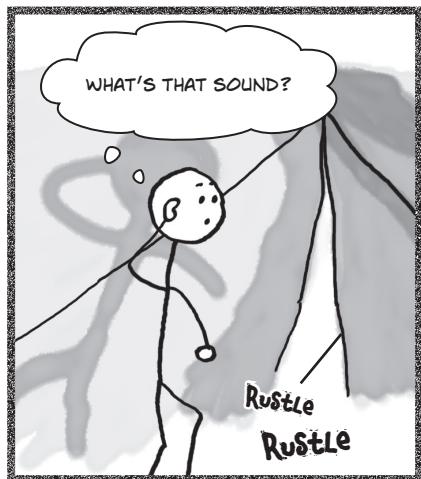
Risk monitoring and controlling is exactly like the other change control processes.

Monitor Risks



Project Management plan updates

Project document updates are always outputs from a Monitoring and Controlling process.



* Note from the authors: We're not exactly sure why he feels his mission was accomplished after spraying a bear in the face and then jumping off of a cliff. But it seems to work!

Question Clinic: The which-is-NOT question



YOU'LL SEE SOME QUESTIONS ON THE EXAM THAT LIST INPUTS, OUTPUTS, TOOLS, OR CONCEPTS AND ASK YOU TO DETERMINE WHICH ONE OF THEM IS NOT PART OF THE GROUP. USUALLY, YOU CAN FIGURE THEM OUT BY GOING THROUGH THE ANSWER CHOICES ONE BY ONE AND ELIMINATING THE ONE THAT DOESN'T BELONG.

This is the one with tornado diagrams. It's got to be part of the group.

This one is definitely a quantitative analysis technique. Multiplying probability with the value of positive and negative outcomes of the project is all about putting numbers to risk.

Remember reading something about Monte Carlo back in Chapter 6? It might be right...right? But wait, it's also a tool for using random numbers to model out possible risks on the project. It's definitely part of quantitative analysis.

117. Which of the following is not a quantitative analysis technique?

- A. Sensitivity analysis
- B. Expected monetary value
- C. Monte Carlo analysis
- D. Reserve analysis

D's definitely the right answer. It's about numbers, but it isn't concerned with assigning numbers to the risk. It's about keeping tabs on the contingency reserve when risks materialize, so it's a Monitoring and Controlling process. This has to be it!

TAKE YOUR TIME AND THINK YOUR WAY THROUGH IT. ALL OF THEM WILL HAVE SOMETHING IN COMMON BUT ONE. AS LONG AS YOU REMEMBER THE GROUP YOU'RE FITTING THEM INTO, YOU WON'T HAVE ANY TROUBLE.

**Take your time
answering
which-is-NOT
questions.**



HEAD LIBS

Fill in the blanks to come up with your own which-is-NOT question!

Which of the following is NOT a _____ ?
(input, output, tool, process, or concept)

- A. _____
(input, output, tool, or process that is in the group)
- B. _____
(input, output, tool, or process that is in the group)
- C. _____
(input, output, tool, or process that is in the group)
- D. _____
(the right answer)



Sharpen your pencil Solution

You'll need to know how to do EMV calculations for the test. Give them a shot now—they're pretty easy once you get the hang of them.

Take a look at this table of risks.

Risk	Probability	Impact
Navigation equipment failure	15%	costs \$300 due to getting lost
Unseasonably warm weather	8%	save \$500 in excavation costs
Wild animals eat rations	10%	costs \$100 for replacements

1. Calculate the EMV for each of these three risks.

$$\text{Navigation equipment failure: } 15\% \times -\$300 = -\$45.00$$

$$\text{Unseasonably warm weather: } 8\% \times \$500 = \$40.00$$

$$\text{Wild animals eat rations: } 10\% \times -\$100 = -\$10.00$$

Don't forget to use a positive value here because it's an opportunity, not a threat.

2. If these are the only risks on the project, calculate the total EMV.

$$\text{Total EMV} = -\$45.00 + \$40.00 + -\$10.00 = -\$15.00$$

You get the total EMV by adding up the EMV for each risk.

3. The latest weather report came out, and there is now a 20% chance of unseasonably warm weather. What's the new EMV for the project?

$$\text{Unseasonably warm weather: } 20\% \times \$500 = \$100.00$$

$$\text{The new total EMV} = -\$45.00 + \$100.00 + -\$10.00 = \$45.00$$

The EMV is now positive, which means the project should cost less than you originally budgeted.

4. Now the cost of replacement rations goes up to \$150. What's the new EMV for the project?

$$\text{Wild animals eat rations: } 10\% \times -\$150 = -\$15.00$$

$$\text{The new total EMV} = -\$45.00 + \$100.00 + -\$15.00 = \$40.00$$



Exercise Solution

Looking at the decision tree on the facing page, see if you can figure out the expected monetary value depending on the decisions the team makes.

When the probability of high winds changed to 45%, then the probability of low winds also changed: to 55%.

1. You hear a weather report that says there's now a 45% chance of high winds. Does it still make sense to buy the heavier tent?

EMV of choosing the heavier tent: $-\$350 \text{ plus } (45\% \times -\$48) \text{ plus } (55\% \times -\$10) = -\$377.10$

EMV of choosing the lighter tent: $-\$130 \text{ plus } (45\% \times -\$953) \text{ plus } (55\% \times -\$15) = -\$567.10$

It still makes sense to choose the heavier tent.

2. If you don't buy the heavier tent, then you have room to take along a wind generator that can power your equipment, and that will save you \$1,100 in portable batteries if there's a heavy wind. If there's still a 45% chance of high winds, does it still make sense to buy the heavier tent?

EMV of choosing the heavier tent: $-\$350 \text{ plus } (45\% \times -\$48) \text{ plus } (55\% \times -\$10) = -\$377.10$

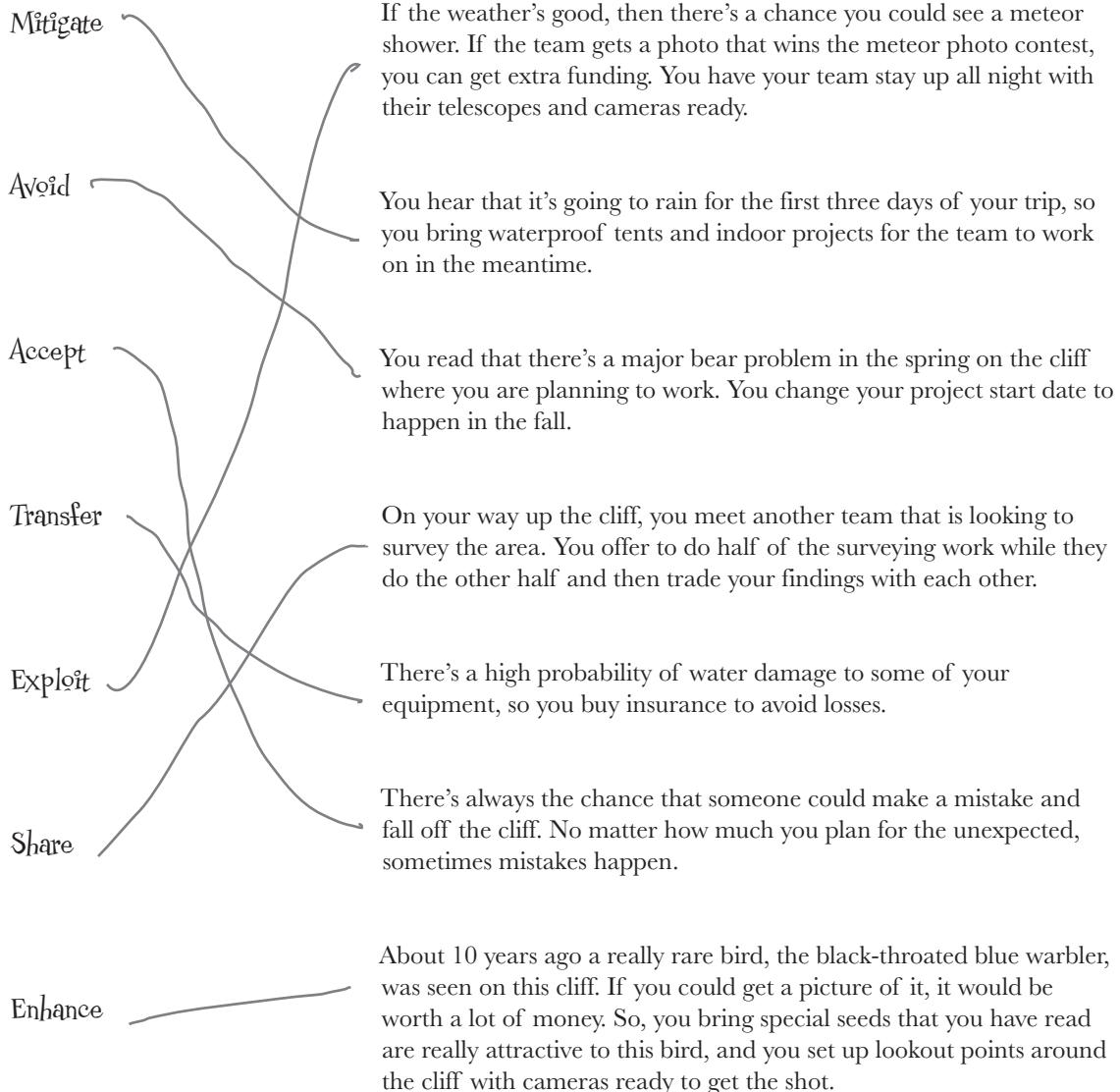
EMV of choosing the lighter tent: $-\$130 \text{ plus } (45\% \times \$147) \text{ plus } (55\% \times -\$15) = -\$72.10$

Now it makes sense to choose the lighter tent.

So where did this $\$147$ come from? Well, if there's a heavy wind, then the generator turns this into an opportunity. You'll still see $\$953$ in equipment damage, but that's offset by the $\$1,100$ in savings for portable batteries. That puts you ahead by $\$147$ —but only if there's a heavy wind!



Which risk response technique is being used in these situations? Match each technique to its scenario.



Exam Questions

1. The project manager for a construction project discovers that the local city council may change the building code to allow adjoining properties to combine their sewage systems. She knows that a competitor is about to break ground in the adjacent lot and contacts him to discuss the possibility of having both projects save costs by building a sewage system for the two projects.

This is an example of which strategy?

- A. Mitigate
- B. Share
- C. Accept
- D. Exploit

2. Which of the following is NOT a risk response technique?

- A. Exploit
- B. Transfer
- C. Mitigate
- D. Collaborate

3. You are using an RBS to manage your risk categories. What process are you performing?

- A. Plan Risk Management
- B. Identify Risks
- C. Perform Qualitative Risk Analysis
- D. Perform Quantitative Risk Analysis

4. Which of the following is used to monitor low-priority risks?

- A. Triggers
- B. Watch lists
- C. Probability and Impact matrix
- D. Monte Carlo analysis

Exam Questions

5. You're managing a construction project. There's a 30% chance that weather will cause a three-day delay, costing \$12,000. There's also a 20% chance that the price of your building materials will drop, which will save \$5,000. What's the total EMV for both of these?
- A. -\$3,600
 - B. \$1,000
 - C. -\$2,600
 - D. \$4,600
6. Joe is the project manager of a large software project. When it's time to identify risks on his project, he contacts a team of experts and sends them a list of questions to help them all come up with a list of risks and send it in. What technique is Joe using?
- A. SWOT
 - B. Ishikawa diagramming
 - C. Interviews
 - D. Brainstorming
7. Susan is the project manager on a construction project. When she hears that her project has run into a snag due to weeks of bad weather on the job site, she says "No problem, we have insurance that covers cost overruns due to weather." What risk response strategy did she use?
- A. Exploit
 - B. Transfer
 - C. Mitigate
 - D. Avoid
8. You're performing Identify Risks on a software project. Two of your team members have spent half of the meeting arguing about whether or not a particular risk is likely to happen on the project. You decide to table the discussion, but you're concerned that your team's motivation is at risk. The next item on the agenda is a discussion of a potential opportunity on the project in which you may be able to purchase a component for much less than it would cost to build.
- Which of the following is NOT a valid way to respond to an opportunity?
- A. Exploit
 - B. Transfer
 - C. Share
 - D. Enhance

Exam Questions

9. Risks that are caused by the response to another risk are called:

- A. Residual risks
- B. Secondary risks
- C. Cumulative risks
- D. Mitigated risks

10. What's the main output of the Risk Management processes?

- A. The Risk Management plan
- B. The risk breakdown structure
- C. Work performance information
- D. The risk register and project documents updates

11. Tom is a project manager for an accounting project. His company wants to streamline its payroll system. The project is intended to reduce errors in the accounts payable system and has a 70% chance of saving the company \$200,000 over the next year. It has a 30% chance of costing the company \$100,000.

What's the project's EMV?

- A. \$170,000
- B. \$110,000
- C. \$200,000
- D. \$100,000

12. What's the difference between management reserves and contingency reserves?

- A. Management reserves are used to handle known unknowns, while contingency reserves are used to handle unknown unknowns.
- B. Management reserves are used to handle unknown unknowns, while contingency reserves are used to handle known unknowns.
- C. Management reserves are used to handle high-priority risks, while contingency reserves are used to handle low-priority risks.
- D. Management reserves are used to handle low-priority risks, while contingency reserves are used to handle high-priority risks.

Exam Questions

13. How often should a project manager discuss risks with the team?

- A. At every milestone
- B. Every day
- C. Twice
- D. At every status meeting

14. Which of the following should NOT be in the risk register?

- A. Watch lists of low-priority risks
- B. Relative ranking of project risks
- C. Root causes of each risk
- D. Probability and Impact matrix

15. Which of the following is NOT true about Risk Management?

- A. The project manager is the only person responsible for identifying risks.
- B. All known risks should be added to the risk register.
- C. Risks should be discussed at every team meeting.
- D. Risks should be analyzed for impact and priority.

16. You're managing a project to remodel a kitchen. You find out from your supplier that there's a 50% chance that the model of oven that you planned to use may be discontinued, and you'll have to go with one that costs \$650 more. What's the EMV of that risk?

- A. \$650
- B. -\$650
- C. \$325
- D. -\$325

17. Which risk analysis tool is used to model your risks by running simulations that calculate random outcomes and probabilities?

- A. Monte Carlo analysis
- B. Sensitivity analysis
- C. EMV analysis
- D. Delphi technique

Exam Questions

18. A construction project manager has a meeting with the team foreman, who tells him that there's a good chance that a general strike will delay the project. They brainstorm to try to find a way to handle it, but in the end decide that if there's a strike, there is no useful way to minimize the impact to the project. This is an example of which risk response strategy?

- A. Mitigate
- B. Avoid
- C. Transfer
- D. Accept

19. You're managing a project to fulfill a military contract. Your project team is assembled, and work has begun. Your government project officer informs you that a supplier that you depend on has lost the contract to supply a critical part. You consult your risk register and discover that you did not plan for this. What's the BEST way to handle this situation?

- A. Consult the Probability and Impact matrix
- B. Perform Quantitative and Qualitative Risk Analysis
- C. Recommend preventive actions
- D. Look for a new supplier for the part

20. Which of the following BEST describes risk audits?

- A. The project manager reviews each risk on the risk register with the team.
- B. A senior manager audits your work and decides whether you're doing a good job.
- C. An external auditor reviews the risk response strategies for each risk.
- D. An external auditor reviews the project work to make sure the team isn't introducing a new risk.

Answers

~~Exam Questions~~**1. Answer: B**

Sharing is when a project manager figures out a way to use an opportunity to help not just her project but another project or person as well.

It's OK to share an opportunity with a competitor; that's a win-win situation.

2. Answer: D

Collaborating is a conflict resolution technique.

3. Answer: A

You use an RBS to figure out and organize your risk categories even before you start to identify them. Then you decompose the categories into individual risks as part of Identify Risks.

4. Answer: B

Your risk register should include watch lists of low-priority risks, and you should review those risks at every status meeting to make sure that none of them have occurred.

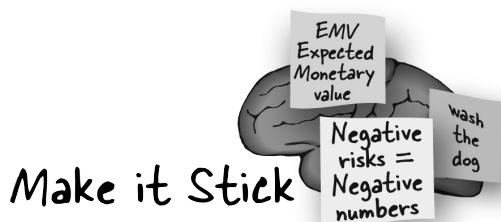
5. Answer: C

The expected monetary value (or EMV) of the weather risk is the probability (30%) times the cost (\$12,000), but don't forget that since it's a risk, that number should be negative. So its EMV is $30\% \times -\$12,000 = -\$3,600$. The building materials opportunity has an EMV of $20\% \times \$5,000 = \$1,000$. Add them up and you get $-\$3,600 + \$1,000 = -\$2,600$.

When you're calculating EMV, negative risks give you negative numbers.

6. Answer: C

Using the Interview technique, experts supply their opinions of risks for your project so that they each get a chance to think about the project.



Answers~~Exam Questions~~**7. Answer: B**

Susan bought an insurance policy to cover cost overruns due to weather. She transferred the risk from her company to the insurance company.

8. Answer: B

 Wow, did you see that huge red herring?

You wouldn't want to transfer an opportunity to someone else! You always want to find a way to use that opportunity for the good of the project. That's why the response strategies for opportunities are all about figuring out ways to use the opportunity to improve your project (or another, in the case of sharing).

9. Answer: B

A secondary risk is a risk that could happen because of your response to another risk.

10. Answer: D

The processes of Risk Management are organized around creating the risk register, and updating it as part of project documents updates.

11. Answer: B 

The key to this one is to remember that the money the project makes is positive, and the money it will cost is negative.

$\$200,000 \times 0.70 = \$140,000$ savings, and $\$100,000 \times 0.30 = -\$30,000$ expenses. Add them together and you get \$110,000.

12. Answer: B

Contingency reserves are calculated during Perform Quantitative Risk Analysis based on the risks you've identified. You can think of a risk as a "known unknown"—an uncertain event that you know about, but which may not happen—and you can add contingency reserves to your budget in order to handle them. Management reserves are part of Cost Management—you use them to build a reserve into your budget for any unknown events that happen.

 That's why it's useful to figure out the EMV for a risk—so you know how big your contingency reserve should be.

~~Exam Questions~~

13. Answer: D

Risk monitoring and response is so important that you should go through your risk register at every status meeting!

14. Answer: D

The Probability and Impact matrix is a tool that you use to analyze risks. You might find it in your Project Management plan, but it's not included in the risk register.

15. Answer: A

It's really important that you get the entire team involved in the Identify Risks process. The more people who look for risks, the more likely it is that you'll find the ones that will actually occur on your project.

16. Answer: D

Even though this looks a little wordy, it's just another EMV question. The probability of the risk is 50%, and the cost is -\$650, so multiply the two and you get -\$325.

17. Answer: A

This is just the definition of Monte Carlo analysis. That's where you use a computer simulation to see what different random probability and impact values do to your project.

18. Answer: D

There are some risks that you just can't do anything about. When that happens, you have to accept them. But at least you can warn your stakeholders about the risk, so nobody is caught off guard.

Answers

~~Exam Questions~~

19. Answer: D

You've got an unplanned event that's happened on your project. Is that a risk? No. It's a project problem, and you need to solve that problem. Your Probability and Impact matrix won't help, because the probability of this happening is 100%—it's already happened. No amount of risk planning will prevent or mitigate the risk. And there's no sense in trying to take preventive actions, because there's no way you can prevent it. So the best you can do is start looking for a new part supplier.

20. Answer: C

It's a good idea to bring in someone from outside of your project to review your risks. The auditor can make sure that each risk response is appropriate and really addresses the root causes of each risk.

I SEE---THIS WASN'T
A RISK AT ALL, IT WAS
JUST A PROBLEM THAT CAME
UP DURING THE PROJECT. I
BET BETTER RISK PLANNING
MIGHT HAVE HELPED THE
TEAM PREPARE FOR THIS!



12 Procurement management

Getting some help



Some jobs are just too big for your company to do on its own. Even when the job isn't too big, it may just be that you don't have the expertise or equipment to do it. When that happens, you need to use **Procurement Management** to find another company to **do the work for you**. If you find the **right seller**, choose the **right kind of relationship**, and make sure that the **goals of the contract are met**, you'll get the job done, and your project will be a success.

Victim of her own success

Kate's last project went really well. In fact, maybe a little too well. The company's customer base grew so much that now the IT department's technical support staff is overwhelmed. Customers who call up looking for technical support have to spend a long time on hold, and that's not good for the company.



Calling in the cavalry



WE'VE GOT A NEW
PROJECT FOR YOU, KATE. WE
FIGURE IT'S GOING TO TAKE ABOUT
18 MONTHS TO RAMP UP THE NEW
TECH SUPPORT CALL CENTER. CAN
YOU HANDLE IT?

Kate: No problem. The hard part will be figuring out how to manage the transition. Are we going to try to expand the team immediately, or call in a supplier to help us out?

Ben: Whoa, hold on there! Is going outside the company even an option?

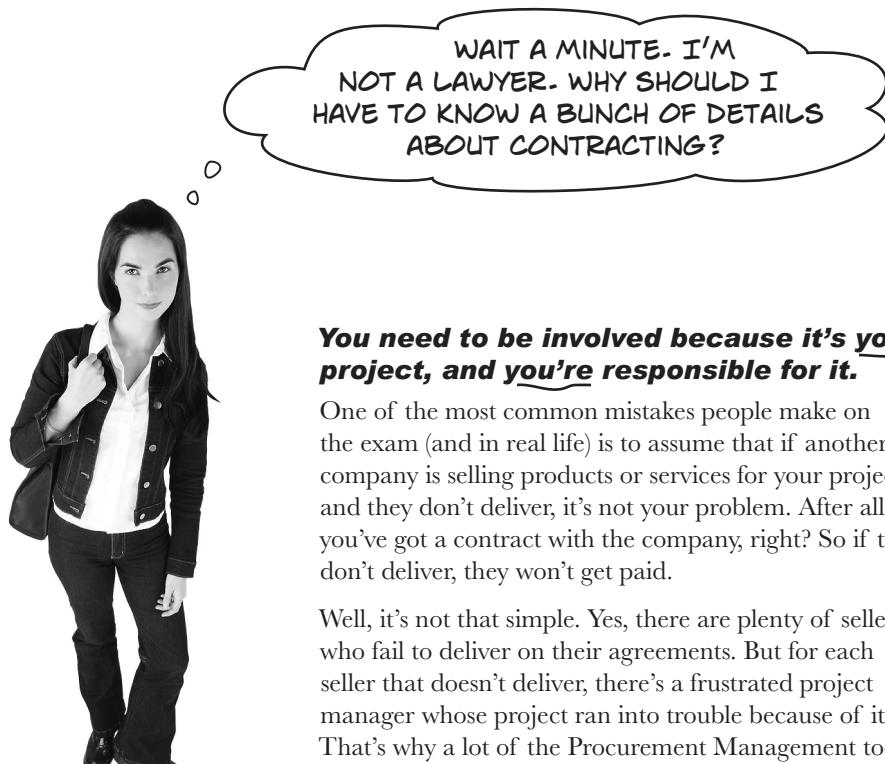
Kate: Look, our tech support team is already at full capacity, and it'll take months to upgrade the facilities to handle more people...not to mention to hire and train the staff. We may be able to handle it ourselves, but there's a good chance that the easiest way to get the job done is to go outside our company to find a vendor to do the work.

Ben: But isn't it kind of risky thinking about working with another company? I mean, what if it goes out of business during our project? Or what if it costs too much?

Kate: Well, we'll need to make sure that we answer those questions. But this isn't the first time our company's brought on a contractor like this. The legal department has done this kind of thing before. I'll set up a meeting with somebody over there and see if they can help us out.

Ben: OK, you can follow up on that. But I'm still not sure about this.

Sometimes you need to hire an outside company to do some of your project work. That's called procurement, and the outside company is called the seller.



You need to be involved because it's your project, and you're responsible for it.

One of the most common mistakes people make on the exam (and in real life) is to assume that if another company is selling products or services for your project and they don't deliver, it's not your problem. After all, you've got a contract with the company, right? So if they don't deliver, they won't get paid.

Well, it's not that simple. Yes, there are plenty of sellers who fail to deliver on their agreements. But for each seller that doesn't deliver, there's a frustrated project manager whose project ran into trouble because of it. That's why a lot of the Procurement Management tools and techniques are focused on selecting the *right* seller and communicating exactly what you'll need to the people doing the work.



Watch it!

The PMP exam is based on contracting laws and customs in the United States.

Are you used to working in a country that ISN'T the US? Then you should be especially careful about these processes. You may be used to working with agreements in a way that isn't exactly the same as how they'll work on the exam questions. Luckily, the US government publishes a lot of information on contracting at <http://www.acquisition.gov>. Take a look at the site if you want a little more background.



Agreement Process Magnets

There are three Procurement Management processes. They're pretty easy to understand—you can probably guess which ones are which from their descriptions. Connect the description of each process with its name, and then try to guess which process group it's in.

Descriptions of each process

Plan out what you'll purchase, and how and when you will need the contracts to be negotiated for your project.

Process names

.....

Process groups

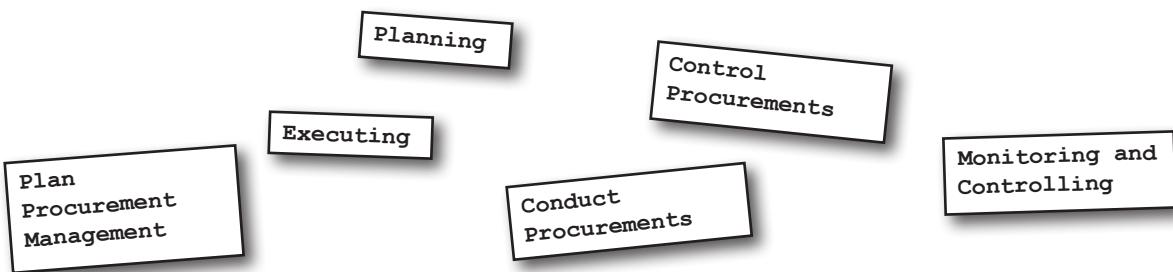
.....

Decide on the seller (or sellers) you are going to work with, and finalize and sign the contract.

.....

Keep tabs on the contract. Make sure your company is getting what you paid for.

.....





Agreement Process Magnets Solutions

There are three Procurement Management processes. They're pretty easy to understand—you can probably guess which ones are which from their descriptions. Connect the description of each process with its name, and then try to guess which process group it's in.

Descriptions of each process

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Decide on the seller (or sellers) you are going to work with, and finalize and sign the contract.

Keep tabs on the contract. Make sure your company is getting what you paid for.

Process names

Plan Procurement Management

Conduct Procurements

Control Procurements

Process groups

Planning

Executing

Monitoring and Controlling

This process is for making changes to the contract, and correcting any problems with the seller's work.

Ask the legal expert



HI KATE. I'M STEVE FROM
LEGAL. BEN SAID YOU NEEDED
TO TALK TO ME. DO YOU HAVE A
MINUTE?

Kate: Thanks for coming by, Steve. We're looking for a contractor to handle tech support while we bring on more people in our call center. How do we normally handle this stuff?

Steve: Here's how it usually works. I'll actually write the contract and do the negotiation. But before I do that, I'll need to sit down with you to understand what the contract has to accomplish.

Kate: So I'm not involved at all?

Steve: Oh, you're definitely involved. You need to help with the negotiations, because you're the only person who really understands what we're trying to accomplish with the contract.

Kate: OK, that makes sense. So when do we get started?

Steve: Well, not so fast. We need to be really sure that the way we pick our vendors is absolutely fair. We've got some company guidelines that you'll need to follow. And once we've got the contract signed and the work is under way, we'll need to meet to make sure the contract is really being followed. And if there's a problem and we need to negotiate a change to the contract, you'll need me to do it.

Kate: OK, I can handle that. So should I start working on something to send out to sellers?

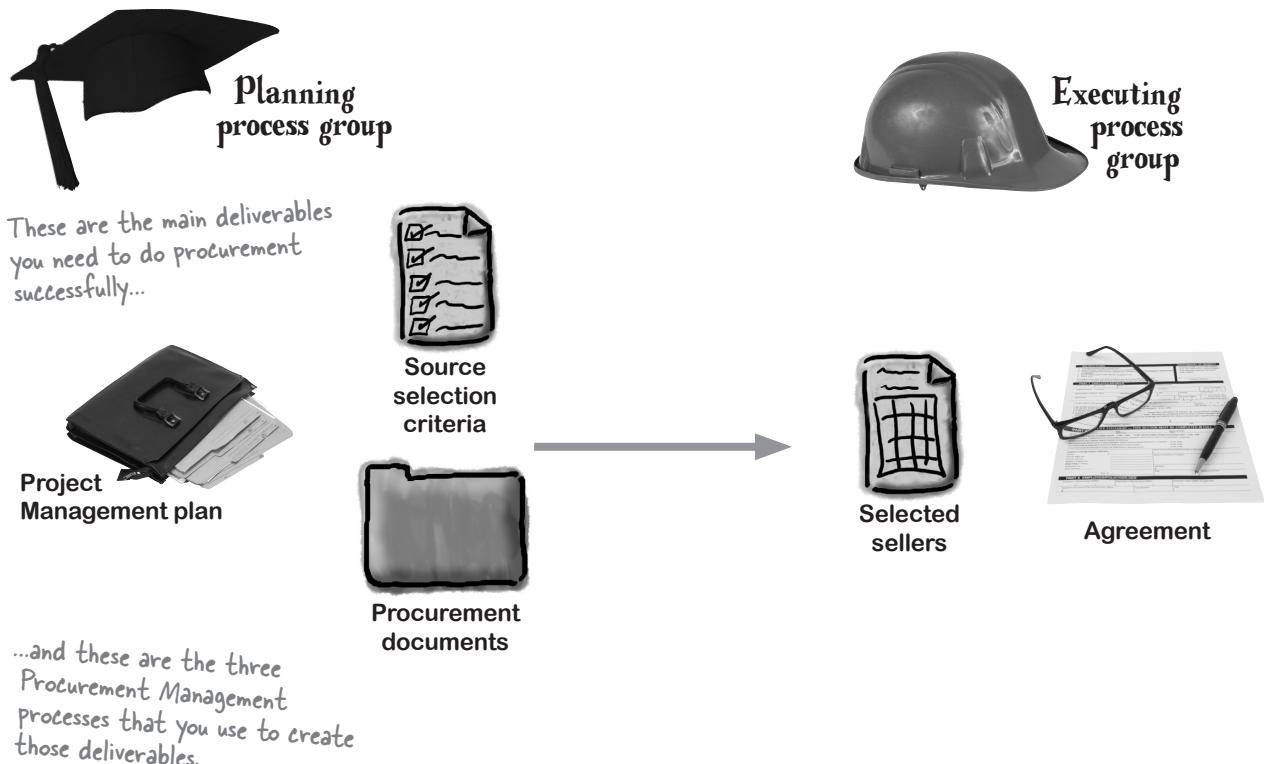
Steve: Not quite. Before we even get started with all of that, are you sure we really need to contract this work?



What should Kate do to figure out if it's really a good idea to contract the work?

Anatomy of an agreement

Procurement is pretty intuitive, and the **Procurement Management processes** follow a really sensible order. First you plan what you need to contract; then you plan how you'll do it. Next, you send out your contract requirements to sellers. They bid for the chance to work with you. You pick the best one, and then you sign the contract with them. Once the work begins, you monitor it to make sure the contract is being followed.



Plan Procurement Management

Here's where you take a close look at your needs, to be sure that you really need to create a contract. You figure out what kinds of contracts make sense for your project, and you try to define all of the parts of your project that will be contracted out.

You'll need to plan out each individual contract for the project work and work out how you'll manage it. That means figuring out what metrics it will need to meet to be considered successful, how you'll pick a seller, and how you'll administer the contract once the work is happening.

Conduct Procurements

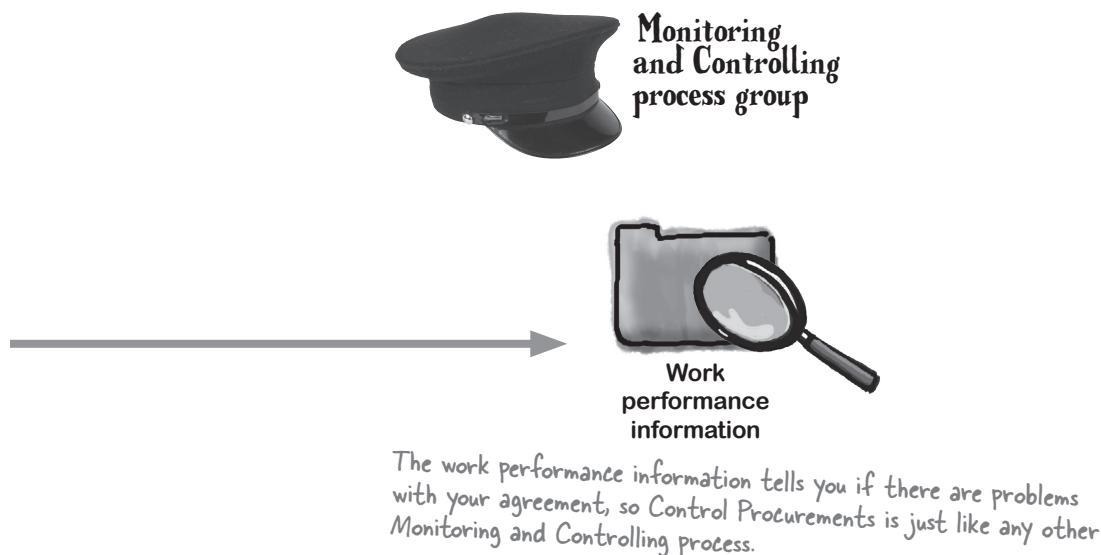
This process is all about getting the word out to potential agreement or contract partners about the project and how they can help you. You hold **bidder conferences** and find qualified sellers that can do the work.

Next, you evaluate all of the responses to your procurement documents and find the seller that suits your needs the best. When you find them, you sign the contract, and then the work can begin.

You can have several contracts for a single project

The first Procurement Management process is **Plan Procurement**

Management. It's a familiar planning process, and you use it to plan out all of your procurement activities for the project. The other processes are done separately for every contract. Here's an example. Say you're managing a construction project, and you've got one contract with an electrician and another one with a plumber. That means you'll go through those processes two separate times, once for each contractor.



Control Procurements

When the contract is under way, you stay on top of the work and make sure the contract is adhered to. You monitor what the contractor is producing and make sure everything is running smoothly. Occasionally, you'll need to make changes to the contract. Here's where you'll find and request those changes.

Start with a plan for the whole project



You need to think about all of the work that you will contract out for your project before you do anything else. The **Plan Procurement Management process** is all about figuring that out, and writing up a plan for how you'll do it.

You'll need to make sure that your contracts match your business case and benefits management plan.



Business documents

Inputs



Project Management plan



Organizational process assets

Past contracts can be a useful resource in setting up a new procurement.



Project documents

To plan procurements you'll need to consult the following project documents: milestone list, project team assignments, requirements documentation, requirements traceability matrix, resource requirements, risk register, and the stakeholder register.

You need to consider the level of expertise your company has with the product or work you're thinking of contracting, as well as the job and contracting markets you operate in.



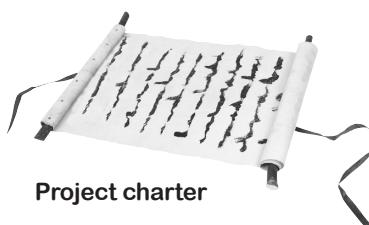
Enterprise environmental factors

Tools

Data analysis: make-or-buy analysis

means figuring out whether or not you should be contracting the work or doing it yourself. It could also mean deciding whether to build your own solution to your problem or buy one that is already available. Most of the same factors that help you make every other major project decision will help you with this one. How much does it cost to build it versus buy it? How will this decision affect the scope of your project? How about your project schedule? Do you have time to do the work and still meet your commitments? As you plan out what you will and won't contract, you need to have thought through your reasoning pretty carefully.

There are some resources (like heavy equipment) that your company can buy, rent, or lease depending on the situation. You'll need to examine leasing versus buying costs and determine the best way to go forward.



Project charter

The project charter contains the information needed to frame the contract's goals: the project objectives, description, summary milestones, and preapproved financial resources.

This plan will have:

- ➊ The planned delivery dates for the work or products you are contracting
- ➋ The company's standard documents you will use
- ➌ The contract types you plan to use, and any metrics that will be used to measure the contractor's performance
- ➍ Any constraints or assumptions you need to know about all of the contracts you plan to create for your project



Expert judgment means asking someone who's made the same kind of decision before to help you look at all the information you have for your project and make the right decision. Experts can be really helpful in evaluating technology, or providing insight into how your work might be done in different sourcing scenarios.

Data gathering: market research means checking out reviews of possible vendors to work with. Sometimes procurement teams will go to conferences or read published reports that evaluate vendors doing similar contracts to help make decisions.

Source selection analysis is how you determine which supplier to choose.

Meetings help your team put their heads together and make sure they're covering all of the project's needs when setting up a procurement.

Outputs



This is just a list of the work that will be contracted. This statement of work will be given to potential contracting partners later.

After doing your make-or-buy analysis, you write down what you learned so that other people understand your rationale.

Here's where you define your delivery methods, contract payment types, and procurement phases.

And you'll use this one to help you figure out which seller you want to hire.





I STILL DON'T BUY IT. WHY
SHOULD I GO OUTSIDE OF MY
COMPANY? WHY CAN'T I JUST HAVE
MY TEAM DO ALL THE WORK?

Because sometimes it's not worth having your team do part of the job.

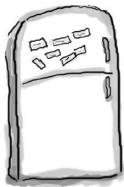
If your company needed to renovate your office, would you hire the carpenter, electrician, and builders? Would you buy the power tools, cement mixer, trucks, and ladders? Of course not. You'd hire a contractor to do the work, because it would cost too much to buy all that stuff for one job, and you wouldn't want to hire people just for the job and then fire them when it was done. Well, the same goes for a lot of jobs on your projects. You don't always want to have your company build everything. There are a lot of jobs where you want to hire a **seller**.

There are a lot of words for the company you're hiring: contractor, consultant, external company...but for the PMP exam, you'll typically see the term "seller."



It's natural to feel a little nervous about this contracting stuff.

A lot of project managers have only ever worked with teams inside their own companies. All this talk of contracts, lawyers, proposals, bids, and conferences can be intimidating if you've never seen it before. But don't worry. Managing a project with a contractor is really similar to managing one that uses your company's employees. There are just a few new tools and techniques that you need to learn...but they're not hard, and you'll definitely get the hang of them really quickly.



Make or Buy Magnets

Figure out whether or not Kate and Ben should contract out the tech support work by organizing these facts about the project into Make or Buy columns. The first few have been done for you.

This really is how a lot of people handle make-or-buy decisions: by looking at all of the information they have for the project and using it to determine whether the facts line up under "Make" or "Buy."

Make

Training the contractor's employees will be less valuable because we won't be able to use their knowledge when the contract is up.

It might be hard to control the quality of the contractor's work.

The contract team can have a staff trained and ready within a month from the signed contract.

The cost for equipment and training for a 10-person team is around \$50,000. Contracts could be drawn up to cut that cost down a lot.

Buy

The next big product release is six months away.

We think the procurement process will take around three months, and ramping up staff in the call center will take eight months.

Our estimate is that it will cost around \$30,000 per month to hire an additional 10 people and reduce wait time to 10 minutes per call. The cheapest contract for this is around \$40,000 per month.

Contracting companies who specialize in tech support have access to a lot of information and best practices that could make the project go more smoothly.



Make or Buy Magnets Solutions

Figure out whether or not Kate and Ben should contract out the tech support work by organizing these facts about the project into Make or Buy columns. The first few have been done for you.

Make

It might be hard to control the quality of the contractor's work.

Our estimate is that it will cost around \$30,000 per month to hire an additional 10 people and reduce wait time to 10 minutes per call. The cheapest contract for this is around \$40,000 per month.

Training the contractor's employees will be less valuable because we won't be able to use their knowledge when the contract is up.

Even though the staff costs will be higher with the contractor, not having to pay for equipment and training could offset the higher labor cost.

There's no way they are going to be able to support even more customers with a new product in six months if they don't have the staff then.

Buy

The next big product release is six months away.

We think the procurement process will take around three months and ramping up staff in the call center will take eight months.

The cost for equipment and training for a 10-person team is around \$50,000. Contracts could be drawn up to cut that cost down a lot.

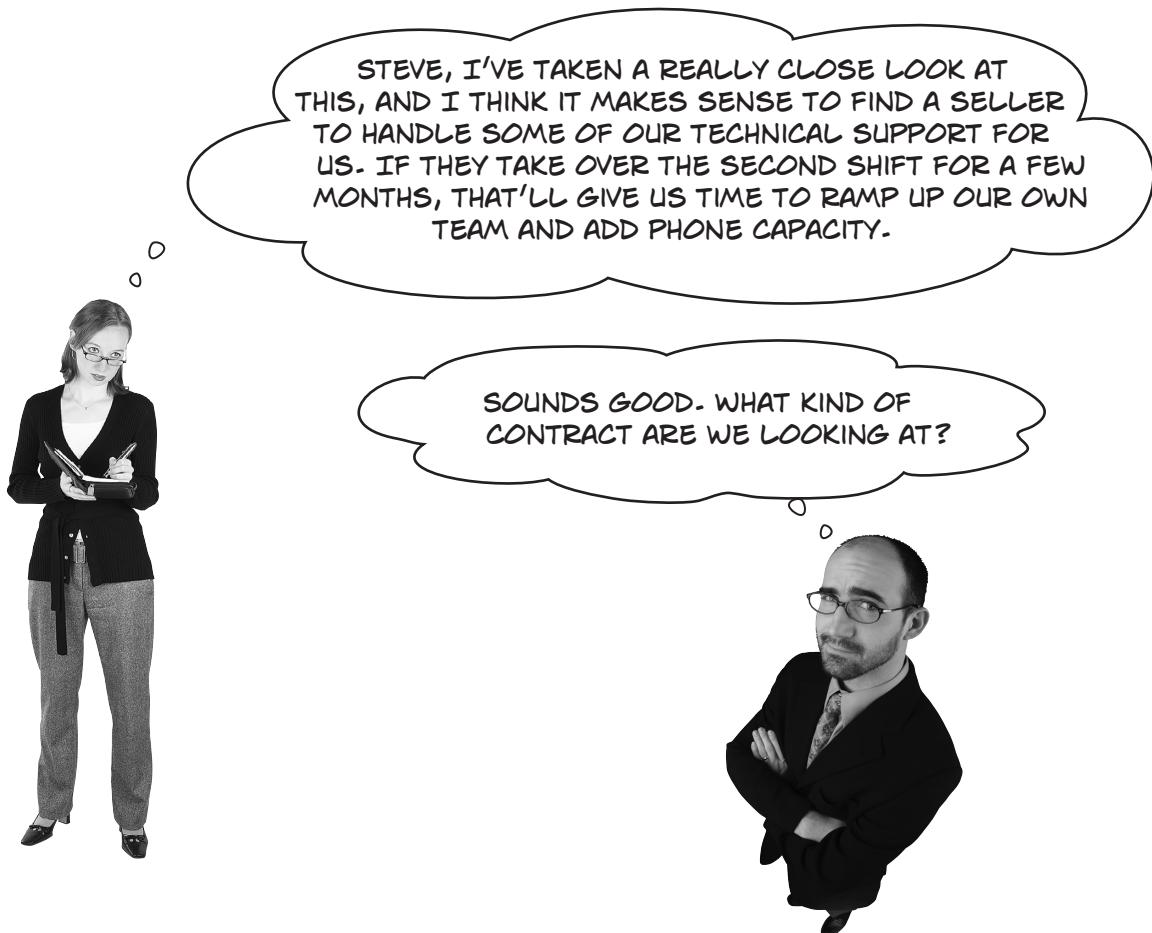
The contract team can have a staff trained and ready within a month from the signed contract.

Contracting companies who specialize in tech support have access to a lot of information and best practices that could make the project go more smoothly.

Sometimes contractors can bring their expertise from running lots of similar projects and make everything run more smoothly than it would if you did it yourself.

The decision is made

Doing make-or-buy analysis just means understanding the reasons for the contract and deciding whether or not to contract out the work. Once you've done that, if you still think contracting is an option, then you should have a good idea of what you need to get out of the contracting process.



Types of contractual agreements

It's a good idea to know a little bit about the most commonly used contract types. They can help you come up with a contract that will give both you and the seller the best chance of success.

Fixed price contracts

This is a category of contracts, sometimes referred to as "lump sum" contracts.

Some PMP exam questions might just refer to a contract type by its acronym (FP, CPFF, etc.).

Firm fixed price (FFP) means that you are going to pay one amount regardless of how much it costs the contractor to do the work. A fixed-price contract only makes sense in cases where the scope is very well known. If there are any changes to the amount of work to be done, the seller doesn't get paid any more to do it.

Fixed price plus incentive fee (FPIF) means that you are going to pay a fixed price for the contract and give a bonus based on some performance goal. You might set up a contract where the team gets a \$50,000 bonus if they manage to deliver an acceptable product before the contracted date.

Fixed price with economic cost adjustments (FPEPA) is a fixed-price contract with special provisions to deal with a very long term—say, 50 years—or different currencies, or other economic conditions that require specialized language.

Cost-reimbursable contracts

Don't worry about trying to cram these into your head right now—you'll get a lot of practice with them throughout the chapter.

Costs plus fixed fee (CPFF) means what it says. You pay the seller back for the costs involved in doing the work, plus you agree to an amount that you will pay on top of that.

Costs plus award fee (CPAF) is similar to the CPFF contract, except that instead of paying a fee on top of the costs, you agree to pay a fee based on the buyer's evaluation of the seller's performance.

Costs plus incentive fee (CPIF) means you'll reimburse costs on the project and pay a fee if some performance goals are met. Kate could set up her project using this contract type by suggesting that the team will get a \$50,000 bonus if they keep the average wait time for the calls down to seven minutes per customer for over a month. If she were on a CPIF contract, she would pay the team their costs for doing the work, and also the \$50,000 bonus when they met that goal.

Time and materials

A lot of people say that the T&M contract is a lot like a combination of a cost-plus and fixed-price contract, because you pay a fixed price per hour for labor, but on top of that you pay for costs like in a cost-plus contract.

Time and materials (T&M) is used in labor contracts. It means that you will pay a rate for each of the people working on your project plus their materials costs. The "time" part means that the buyer pays a fixed rate for labor—usually a certain number of dollars per hour. And the "materials" part means that the buyer also pays for materials, equipment, office space, administrative overhead costs, and anything else that has to be paid for. The seller typically purchases those things and bills the buyer for them. This is a really good contract to use if you don't know exactly how long your contract will last, because it protects both the buyer and seller.



Sharpen your pencil

This is a tough one—take your time and think about each kind of contract.

There are advantages and disadvantages to every kind of contract. Different kinds of contracts carry different risks to both the buyer and seller. Can you think of some them?

Here's a hint: fixed-price contracts don't have much risk for the buyer.

Firm fixed price (FFP)

Risks to the buyer

Risks to the seller

Fixed price plus incentive fee (FPIF)

Risks to the buyer

Risks to the seller

Cost plus fixed fee (CPFF)

Risks to the buyer

Risks to the seller

Cost plus award fee (CPAF)

CPAF contracts are really risky for the seller, not the buyer. Can you figure out why?

Risks to the buyer

Risks to the seller

Cost plus incentive fee (CPIF)

Risks to the buyer

Risks to the seller

Time and materials (T&M)

Risks to the buyer

Risks to the seller

Sharpen your pencil Solution

Firm fixed price (FFP)

Risks to the buyer **The only risk is if the seller doesn't deliver because of costs.**

Risks to the seller **Unexpected costs could be bigger than the contract itself.**

Fixed price plus incentive fee (FPIF)

Risks to the buyer **There's still not much risk to the buyer in fixed-price contracts.**

Risks to the seller **The seller still has the same risks as FFP, but may make more.**

Cost plus fixed fee (CPFF)

CPFF contracts have risks for both the buyer and the seller.

Risks to the buyer **If the costs are too high, the buyer will have to pay a lot more.**

Risks to the seller **A fixed fee on top of costs might not be worth it for the seller.**

Cost plus award fee (CPAF)

CPAF contracts are risky for the sellers, because the buyer subjectively determines their performance, and can decide they didn't perform well enough.

Risks to the buyer **There aren't many risks to the buyer.**

Risks to the seller **If the buyer determines the seller underperformed, he can withhold the fee.**

Cost plus incentive fee (CPIF)

Incentive fees are a really good way to reduce the risk to the buyer on a cost-plus contract.

Risks to the buyer **There's still a risk of cost overruns, but it's not as bad.**

Risks to the seller **The incentive fee isn't guaranteed, so it might not be paid.**

Time and materials (T&M)

A lot of T&M contracts include a "cost not to exceed" clause to make sure this doesn't happen. If the contract doesn't have this, it can get really risky for the buyer!

Risks to the buyer **If costs are too high, the contract could get expensive.**

Risks to the seller **The contract might not cover high overhead costs.**

Take a minute and try to figure out why the T&M contract is a really good choice if you don't know how long the job will last.

More about contracts

There are just a few more things you need to know about any contract to do procurement work.

Every contract needs to outline the work to be done and the payment for that work.

- You might see an exam question that mentions **consideration**—that's just another word for the payment.
- Remember in Risk Management how you used insurance to transfer risk to another company? You did that using a special kind of contract called an insurance policy.
- You might get a question that asks about **force majeure**. This is a kind of clause that you'll see in a contract. It says that if something like a war, riot, or natural disaster happens, you're excused from the terms of the contract.

Always pay attention to the point of total assumption.

- The **point of total assumption** is the point at which the seller assumes the costs. In a fixed-price contract, this is the point where the costs have gotten so large that the seller basically runs out of money from the contract and has to start paying the costs.

You should always make sure both the buyer and seller are satisfied.

- When you negotiate a contract, you should make sure that the buyer and the seller **both** feel comfortable with the terms of the contract. You don't want the people at the seller's company to feel like they got a raw deal—after all, you're depending on them to do good work for your project.



Sharpen your pencil

You might see this kind of question about whether to make or buy. Here's a chance to get a little more practice with making contract decisions.

Kate has **18 months** to build up the capacity her company needs to handle all the technical support calls. See if you can figure out whether it's a better deal for Kate to make or buy.

1. If they handle the extra work within the company instead of finding a seller, it will cost an extra \$35,000 in overtime and \$11,000 in training costs in total, on top of the \$4,400 per person per month for the five-person team needed to do the extra support work. What's the total cost of keeping the work within the company?
2. Kate and Ben talked to a few companies and estimate that it will cost \$20,000 per month to hire another company to do the work, but they'll also need to spend \$44,000 in setup costs. What will contracting the work cost?
3. So does it make more sense to make or buy? Why?

→ Answers on page 680.

how will you evaluate each seller?

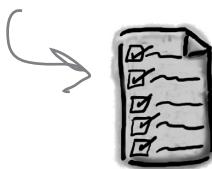
Figure out how you'll sort out potential sellers

The two big outputs of Plan Procurement Management are the **bid documents** and **source selection criteria**. The procurement documents are what you'll use to find potential sellers who want your business. The **source selection criteria** are what you'll use to figure out which sellers you want to use.



Bid documents

A big part of Procurement Management is making sure that both the buyers and sellers are treated fairly. Writing out source selection criteria beforehand is a good way to make sure each seller gets a fair shake.



Source selection criteria

You'd be amazed at how many sellers respond to bids that they have no business responding to. You definitely need to make sure the seller has the skill and capacity to do the work you need.

There are a bunch of different documents you might want to send to sellers who want to bid on your work.

You'll usually include the **procurement statement of work (SOW)** so that sellers know exactly what work is involved.

You need a way to tell sellers that you want them to give you a quote on a fixed-price contract to do the work—this is called a **request for quotation (RFQ)**, and it tells sellers exactly what you want them to submit proposals for. You'll also hear of people using **requests for information (RFI)** to get more information on goods and services that need to be acquired, and **requests for proposals (RFP)** when there's a problem in the project and you're looking for sellers to propose solutions.

A **purchase order** is something you'll send out to a seller whom you know you want to work with. It's an agreement to pay for certain goods or services.

In some cases you'll want to allow for more flexibility in your contract. If you're hiring a seller to build something for you that you've never built before, you'll often encourage them to help you set the scope instead of locking it down.

Decide in advance on how you want to select the sellers.

There are a lot of ways you can select a potential seller. Figuring out if a seller is appropriate for your work is something that takes a lot of talking and thinking—and there's no single, one-size-fits-all way of selecting sellers. But there are some things that you should definitely look for in any seller:

- Can the seller actually do the work you need done?
- How much will the seller charge?
- Can the seller cover any costs and expenses necessary to do the job?
- Are there subcontractors involved that you need to know about?
- Does the seller really understand everything in the SOW and contract?
- Is the seller's project management capability up to the task?

You always put together procurement documents and source selection criteria before you start talking to individual sellers who want your business.



Contract Magnets

Which of the magnets are part of the procurement documents, and which of them are part of the source selection criteria?



Bid documents

Get a financial statement or credit report and verify that the seller is insured

Meet with the project manager and review project processes

Notification to sellers requesting a quotation for fixed-price work

Request for more information about goods being acquired

Go over final pricing plan and contract terms

Request for proposals

Review the SOW with the seller to make sure it's understood



Source selection criteria

→ Answers on page 681.



WHAT'S MY PURPOSE

Here are some of the proposals that Kate is evaluating. Match each one up to the contract type that's most important for the proposal.

The buyer will pay for the cost of phone service, rent on the facilities, and employees, plus an additional \$2,500 per month.

Firm fixed price

The buyer will pay the seller a total of \$285,000 for 18 months of technical support services.

Fixed-price incentive fee

The buyer will pay for the cost of phone service and rent on the facilities, plus \$4,500 per month for employees' time. Costs will not exceed \$14,500 per month.

Cost plus fixed fee

The buyer will pay for the cost of phone service, rent on the facilities, and employees. An additional \$2,750 will be awarded each month that the seller provides an average of 10 issues resolved per person per day and an average wait time of under 3 minutes.

Cost plus incentive fee

The buyer will pay for the cost of phone service, rent on the facilities, and employees. An additional \$5,000 will be paid for exceptional performance.

Cost plus award fee

The buyer will pay the seller a total of \$285,000 for 18 months of technical support services. An additional \$2,750 will be awarded each month that the seller provides an average of 10 issues resolved per person per day and an average wait time of under 3 minutes.

Time and materials

→ Answers on page 668

Get in touch with potential sellers

The next step in procurement is pretty straightforward. You use the **Conduct Procurements process** to, well, get the word out to sellers and see what kind of responses you get. Once you narrow down your list of sellers to a few who look like they might be good candidates, you evaluate all of their responses against your source selection criteria and choose the vendor you're going to work with. All that's left to do after that is to get it all on paper...and then you award the contract!

Use outputs from the Plan Procurement Management process to find the right seller

When you perform the Conduct Procurements process, you'll start with some of the outputs you created in Plan Procurement Management. Here's how you'll use them:



Make-or-buy decisions

The make-or-buy decisions you made will come in handy because they'll tell you what you need to find a contractor to help out with and what you'll do yourself.



Bid documents

Bid documents will have all of the information that you'll actually give to potential sellers to help them bid on your contract. Two of the most commonly used bid documents are the RFI and the RFP.

RFI: Request for information

documents are sent to potential sellers to ask for information about their capability to do the work.

RFP: Request for proposal is when you give a seller the opportunity to examine your procurement documents and write up a proposal of how they'd do the work.



Source selection criteria

Use the source selection criteria to evaluate the sellers that respond to you. By evaluating all of your sellers using the same criteria, you'll be sure that you evaluate everyone fairly and find the right seller for your company.



Procurement statement of work

The procurement statement of work is where you write out all of the work that needs to be done by a contractor. It tells you the scope of the work that you're going to contract to another company.



Procurement strategy

The procurement strategy is where you decide whether it's OK for a contractor you're working with to hire subcontractors and how you'll work with them. You'll determine the terms you'll use to pay for contracted work, and the phases of your contract.

Pick a partner

You've figured out what services you want to procure, and you've gone out and found a list of potential sellers. Now it's time to choose one of them to do the project work—and that's exactly what you do in **Conduct Procurements**.



Inputs



Procurement documentation



Project documents



Seller proposals



Procurement Management plan



Organizational process assets

Tools

Advertising

Sometimes the best way to get in touch with sellers is to place an ad. Also, sometimes you are **required** to take out an ad (like for some government-funded projects), in order to give all sellers full notice.

Expert judgment

Here's another case where it's really good to bring in someone from outside your project to help evaluate each proposal. You should bring in someone with a lot of specific expertise in the work being done to make sure the seller is up to the job.

Bidder conferences

It's really important that you make sure all of the bidders can compete in a fair, unbiased way. And the best way to do that is to get them all in a room together, so that they can ask questions about your contract. That way, you don't give any one seller an advantage by providing inside information that the other sellers don't have access to.

You need to consider the level of expertise your company has with the product or work you're thinking of contracting, as well as the job and contracting markets you operate in.



Enterprise environmental factors

The whole point of the Conduct Procurements process is, well, to conduct procurements...and here they are. Along with the contract, this is the most important output of the process.



Organizational process assets updates

Finally! Everyone's signed on the dotted line, and you've got your contract.



Interpersonal and team skills: negotiation

When you send out a package of procurement documents to a potential seller, it usually has some information about the contract you want to sign: the type of contract, some of the terms, maybe some rough calculations and estimates of the total costs, and other numbers. But not all sellers will want to sign that particular contract, even ones who you'll eventually want to work with. That's why you need to negotiate the terms of the contract.

This is one of those times where your company's lawyers will probably do most of the talking—but that doesn't mean you're not a critical part of the process. Your job is to provide the expertise and in-depth understanding. After all, you're the one who understands your project and your project's needs better than anyone else.

Outputs



In the course of selecting a source, you might find changes that need to be made to your requirements or other documents.



Project documents updates

Data analysis: proposal evaluation

You're going to have to work closely with the seller to figure out if his proposal really is appropriate for the work. You need to be very careful before you choose someone to do the work. That's what this tool is for—it's a kind of "catch-all" that's there to remind you that there's no single way to evaluate a proposal. You need to look at the whole picture—the seller, your needs, and the job.

Any time you do negotiations, you usually end up making some adjustments to your plans—so you'll need to use these for change control.



Change requests



Project Management plan updates



Sharpen your pencil

Kate is putting out an RFP to find a seller to provide technical support for her company. Can you figure out which Conduct Procurements tool she's using?

1. Kate works with her company's seller evaluation committee, which follows a documented, formal evaluation review process to determine which seller should be selected for the contract.
2. Kate contacts an IT trade journal and places a classified ad to try to find sellers.
3. The CEO's brother-in-law runs a company that's bidding on the contract. Kate needs to make sure he gets fair—not preferential—treatment. She doesn't want to give him an unfair advantage, but she also doesn't want to exclude him from the bidding process. So she gathers representatives from all sellers into a room where they can ask questions about the contract out in the open and hear the responses to each question.
4. Kate's company takes part in an equal-opportunity program in which seller companies owned by minorities must be given notice of any RFPs. Her firm employs specific people in a department who are experienced in navigating the specific rules and regulations related to the equal-opportunity arena.

→ Answers on page 680

there are no Dumb Questions

Q: Do I always need to hold a bidder conference whenever I do procurement?

A: No, you don't always need a bidder conference. Sometimes your company has a preferred supplier it always deals with, so you don't have to advertise for sellers. And sometimes there's a **sole source** for a particular service or part—there may be only one company that provides it. In that case, advertising and bidder conferences would be pointless.

The bidder conference has two goals. The first is to make sure that you answer all of the questions from potential sellers. But the other is to make sure that all potential sellers are treated equally and have access to the same information.

Q: I'm still not clear on why I'd want to use a cost-plus contract.

A: One of the best reasons to use a cost-plus contract is to make sure that the seller you're working with doesn't end up getting a raw deal. A fixed-price contract can be pretty risky for a seller. When the seller uses a cost-plus contract—like a cost plus incentive fee, or cost plus fixed fee—it means that there's a built-in guarantee that the seller won't have to swallow cost overruns. If you're reasonably certain that the costs can be contained, or if you set up a good incentive system, then a cost-plus contract can be a really good one for making sure that both the buyer and seller are treated fairly.

Q: Why all this talk about treating the seller fairly? I'm trying to get the best deal I can. Doesn't that mean I should try to get as many concessions from sellers as possible?

A: One of the most important parts of procurement is that both the buyer and seller should feel like they're getting a good deal. You should never expect a seller to have to take on a bad contract. After all, you're depending on the seller to deliver a necessary piece of your project. That's why the goal in any procurement should always be for the buyer and seller to both feel like they were treated fairly.

Q: How do I use organizational process assets to find a seller?

A: When you're conducting procurements, you need to actually find sellers to do the work. Many companies have a list of sellers that they consider qualified to work for them because of past project performance. You'll usually find a list like this on file, and that's what the **qualified seller list** is.



Kate needs to use most of the tools and techniques in Conduct Procurements. Which technique is Kate using in each of these scenarios?

1. Kate and her company's legal team sit down with the sellers and work out the terms of the contract. There's a lot of back and forth, but they settle on an agreement that everyone is comfortable with.

2. Kate sets up criteria for each seller. Before sellers can submit a bid, they must show that they have handled technical support contracts before and have facilities that can handle over 150 simultaneous calls.

3. The CIO and the director of the IT department at Kate's company spent a lot of time setting up the company's existing technical support department, so Kate meets with them to get their technical opinions.

4. Kate sent a notification out to all potential sellers who responded to her RFP, informing them that she was calling a meeting with all of them. She made sure that all prospective sellers had a clear understanding of the work that needed to be done, and she answered all questions from each seller out in the open.

→ Answers on page 669



When Kate selects a seller, she'll need to help her company's legal team negotiate the terms of the contract. Which type of contract do you think is right for Kate's project?

* WHAT'S MY PURPOSE *

Here are some of the proposals that Kate is evaluating. Match each one up to the contract type that's most important for the proposal.

The buyer will pay for the cost of phone service, rent on the facilities, and employees, plus an additional \$2,500 per month.

↑ The contract lays out the costs, and then adds a dollar amount fee on top of that. That's a fixed fee, so it's a CPFF contract.

The buyer will pay the seller a total of \$285,000 for 18 months of technical support services.

Since a preset price will be paid, this is a firm fixed price (or lump sum) contract.

The buyer will pay for the cost of phone service and rent on the facilities, plus \$4,500 per month for employees' time. Costs will not exceed \$14,500 per month.

A lot of T&M contracts will have a "not to exceed" clause to limit risk for the buyer.

The buyer will pay for the cost of phone service, rent on the facilities, and employees. An additional \$2,750 will be awarded each month that the seller provides an average of 10 issues resolved per person per day and an average wait time of under 3 minutes.

Notice how the incentive fee was tied to specific quality measurements. That's a great way to motivate the seller to do a good job.

The buyer will pay for the cost of phone service, rent on the facilities, and employees. An additional \$5,000 will be paid for exceptional performance.

This is the same agreement from the fixed-price contract, but it's got the incentive fee from the CPIF contract. So it's fixed-price incentive fee.

The buyer will pay the seller a total of \$285,000 for 18 months of technical support services. An additional \$2,750 will be awarded each month that the seller provides an average of 10 issues resolved per person per day and an average wait time of under 3 minutes.

Firm fixed price

Fixed-price incentive fee

Cost plus fixed fee

Cost plus incentive fee

Cost plus award fee

Time and materials



Sharpen your pencil Solution

Kate needs to use most of the tools and techniques in Conduct Procurements. Which technique is Kate using in each of these scenarios?

1. This is the first time that Kate's company has contracted out technical support services, so she hires a consultant to help her and the legal team estimate a fair price for the contract.

Interpersonal and team skills: negotiation

Project managers don't usually do the negotiation themselves. They'll get involved and provide expertise and knowledge, but usually rely on a lawyer or legal department to work out the actual terms of the contract.

2. Kate sets up criteria for each seller. Before sellers can submit a bid, they must show that they have handled technical support contracts before and have facilities that can handle over 150 simultaneous calls.

Data analysis: proposal evaluation

When you screen out potential sellers, it makes the job of selecting a seller a lot easier.

3. The CIO and the director of the IT department at Kate's company spent a lot of time setting up the company's existing technical support department, so Kate meets with them to get their technical opinions.

Expert judgment

You've seen a whole lot of other processes that have this same technique. Expert judgment always means getting an opinion from someone outside your project.

4. Kate sent a notification out to all potential sellers who responded to her RFP, informing them that she was calling a meeting with all of them. She made sure that all prospective sellers had a clear understanding of the work that needed to be done, and she answered all questions from each seller out in the open.

Bidder conferences

Two months later...

Kate's procurement project had been going really well...or so she thought. But it turns out there's a problem.



KATE, THE CEO CALLED ME AT 3 A.M. THERE'S A JANITOR'S STRIKE AT THE SELLER'S TECHNICAL SUPPORT OFFICE, AND THAT'S CAUSING ALL SORTS OF HAVOC. NOW OUR WAIT TIMES ARE EVEN LONGER THAN THEY WERE THREE MONTHS AGO. WHAT ARE YOU GOING TO DO ABOUT THIS?

Kate never even thought to ask about the janitors union when the legal team was negotiating the contract.



Keep an eye out for questions that ask about unions, even when they don't have to do with contracts or Procurement Management.

When you work with a union, even if it's through a seller, then the union contract (also called a **collective bargaining agreement**) can have an impact on your project. That means you need to consider the union itself a stakeholder, and when you do your planning you need to make sure any union rules and agreements are considered as constraints.



What could Kate have done to prevent this problem? Could she have detected it sooner? What should she do now?

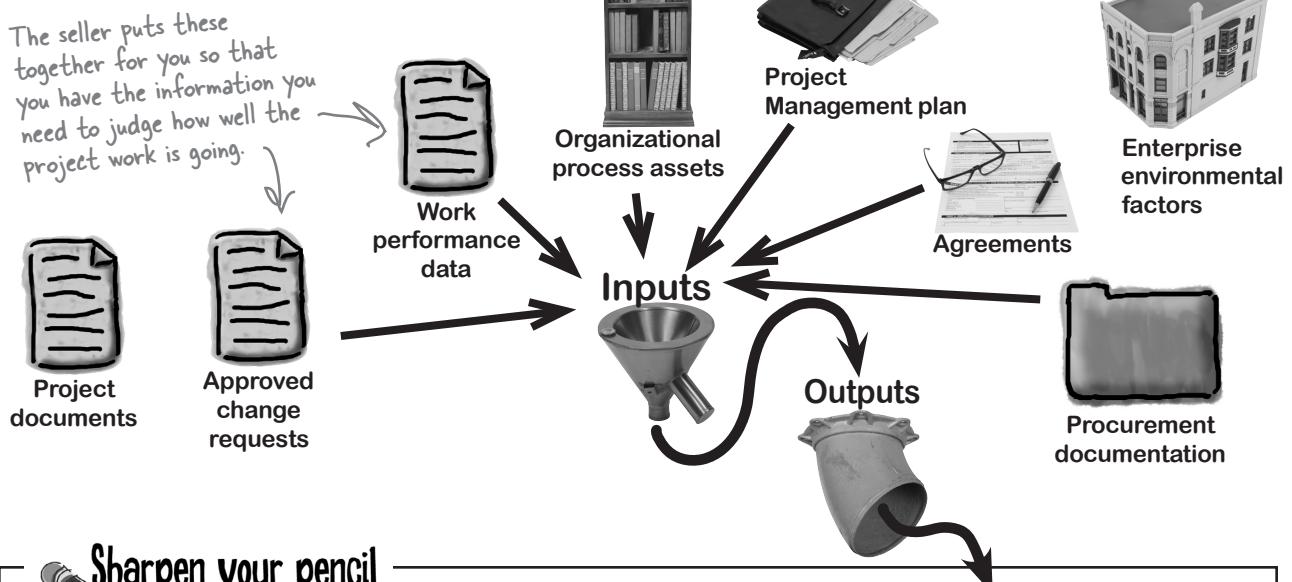


Keep an eye on the contract

You wouldn't just start off a project and then assume everything would go perfectly, would you? Well, you can't do that with a contract either. That's why you use the **Control Procurements process**.

The idea behind the Control Procurements process is that staying on top of the work that the seller is doing is more difficult than working with your own project. That's because when you hire a seller to take over part of your project, the team who's doing the work doesn't report to you. That's why **the first three inputs are especially important**. The approved change requests are the way that you change the terms of the contract if something goes wrong, and the work performance data contains reports the seller uses to tell you how the project is going.

The tools and techniques for the Control Procurements process are on the next page.



Sharpen your pencil

Control Procurements is a typical Monitoring and Controlling process, which means you should be able to figure out most of the outputs. The first few are filled in—can you fill in the others?

1. **Closed procurements**

5. Updates to:

2. **Work performance information**

6. Updates to:

3. **Change requests**

7. Updates to:

4. Updates to:

.....

.....

→ Answers on page 682.

Stay on top of the seller



The **tools and techniques for Control Procurements** are all there to help you work with the seller. Some of them help you look for any potential problems with the seller and make changes to correct them. Others help you with the day-to-day administration work that you need to do in order to keep your project running.

Expert judgment

You're going to need to rely on experts to make sure that the contract is going smoothly. You might need to consult functional experts for the product you are building or financial or law experts to help you understand complexities of the contract itself.

Claims administration

When there's a dispute between a buyer and a seller, that's called a **claim**. Most contracts have some language that explains exactly how claims should be resolved—and since it's in the contract, it's legally binding, and both the buyer and seller need to follow it.

Data analysis tools

Performance reviews

Most contracts lay out certain standards for how well the seller should do the job. Is the seller doing all the work that was agreed to? Is the work being done on time? The buyer has the right to make sure this is happening, and the way to do this is to go over the performance of the seller's team.

Earned value analysis

You can analyze the performance of the contracted team in relation to expectations using earned value calculations in the same way that you use them on projects you are managing within your organization. Earned value gives you a good sense of whether or not a project is delivering as planned.

Trend analysis

As the project is progressing you can measure how close or far away the actual progress is from the progress you had planned. Then you can take a look at all of the measurements together to understand if contract performance is getting better or worse over time.

Inspections and audits

This tool is how the buyer makes sure that the product that the seller produces is up to snuff. An **inspection** is where you'll check up on the actual product or service that the project is producing to make sure that it meets your needs and the terms of the contract. An **audit** is where you check to make sure that both the buyer and the seller are following the procurement process in the way that they agreed.

Buyer-conducted performance reviews let buyers check all of the work that the sellers are doing.

Outputs



Work performance information



Organizational process assets updates



Closed procurements



Procurement documentation updates



Change requests



Project Management plan updates



Project documents updates



Which of the tools and techniques from Control Procurements should Kate use for each situation?

Exercise

1. An important client calls technical support, but ends up spending two hours waiting on hold. Kate doesn't find out until the seller calls her directly. She takes a look at the quality metrics for the contract so far to understand whether or not the seller is meeting the standards defined in the agreement.

2. The CEO's mother calls technical support, but spends two hours waiting for him to answer. Kate needs to make sure the seller is delivering the quality it promised.

3. Kate makes a report that pulls together all of the reporting from the past six months of the contract. If the project keeps going like this, they'll run out of money before it's delivered!

4. According to the statement of work, the seller is supposed to have weekly training sessions with technical support staff, but Kate isn't sure they're being conducted as often as they should be.

5. A manager at the seller says that it's not responsible for training sessions, but Kate thinks it is.



Inspections and audits are similar—but not the same thing.

When you're performing Control Procurements, the most important part of your job is to figure out if the products that the seller is producing meet the agreement, and that is what inspections are for. Audits, on the other hand, are all about understanding whether the contract is following the procurement process as you would expect.



Exercise Solution

Which of the tools and techniques from Control Procurements should Kate use for each situation?

1. An important client calls technical support, but ends up spending two hours waiting on hold. Kate doesn't find out until the seller calls her directly. She takes a look at the quality metrics for the contract so far to understand whether or not the seller is meeting the standards defined in the agreement.

Data Analysis: Performance reviews

A records management system can help Kate by giving her a place to store all the reports from the seller.

2. The CEO's mother calls technical support, but spends two hours waiting for them to answer. Kate needs to make sure the seller is delivering the quality it promised.

Data Analysis: Inspections and audits

You use inspections and audits when you want to review the quality of the product or service being produced.

3. Kate makes a report that pulls together all of the reporting from the past six months of the contract. If the project keeps going like this, they'll run out of money before it's delivered!

Data Analysis: Trend analysis

4. According to the statement of work, the seller is supposed to have weekly training sessions with technical support staff, but Kate isn't sure they're being conducted as often as they should be.

Data Analysis: Performance reviews

If you need to check whether work is being done well, you can use a procurement performance review.

5. A manager at the seller says that it's not responsible for training sessions, but Kate thinks it is.

Claims administration

there are no
Dumb Questions

Q: Should I only care about unions when I'm working with contracts?

A: Unions come up in procurement and contracts whenever a seller has an existing contract with a union. That contract is called a **collective bargaining agreement**, and if that agreement impacts the work that the seller is going to do for you, then you need to make sure that your legal department considers it when they work out the terms of the contract.

But unions are also important when you're doing Project Resource Management. If your company has a collective bargaining agreement with a union, then you need to consider the terms of that contract as **external constraints** to your project plan. Here's an example: let's say you're managing a construction project, and your workers are all union members. Then you need to make sure that you consider any overtime rules and other restrictions on resource availability when you put together your team, your budget, and your plan.

Whenever you see "inspection" or "audit," it means that you're looking at the products that the seller delivered to see if they meet your standards.

Q: Once a contract is signed, does that mean it's never allowed to change?

A: No. This confuses some people, because when you sign a contract, it's legally binding—which means you must abide by the terms of the contract. But that doesn't mean those terms can't change. If both the buyer and the seller agree to make a change to the contract, then they have every right to do so. That's why you have a contract change control system—so you can make sure these changes are made properly.

But you can't always assume that you have the ability to change a contract that you're not happy with. Once your company has agreed to a contract, then you're absolutely required to meet its terms and complete your side of it. If you want to make a change to it, you need to negotiate that change, and it's possible that the seller won't agree to it—just like you have every right to refuse an unreasonable change that the seller requests.

Q: Does the type of contract make a difference in how changes are handled?

A: No, it doesn't. While the type of contract definitely affects a lot of things, changes are always handled the same way. You always use the contract change control system to handle the changes.

That's why the contract change control system is so important. It tells you the exact rules that you need to go through in order to make a change to a contract. No contract is perfect, and most of the time there are little tweaks that both the buyer and seller want to make. This gives them the tools they need to make only the changes that they need, without either team agreeing to a change that they don't want included in the contract.

Q: I still don't get the difference between a performance review and an audit.

A: The difference is that performance reviews are about the **work**, while inspections and audits are about the **deliverables and products**.

You'll use a performance review when you want to make sure that the team at the seller is doing every activity that they should. For example, if you have a contract that requires the seller to perform certain quality control or project management tasks, you might conduct a performance review where you observe the team and verify that they do those tasks. On the other hand, if you want to make sure that the products that the team is producing meet your requirements and standards, you'll send out an auditor to inspect the products that the seller is making to verify that they meet the requirements.

Q: So do project managers usually get involved in contract negotiations?

A: Project managers don't usually do the negotiating themselves, but they do often get involved in contract negotiations. Remember, nobody knows more about the project than the project manager—you know what work needs to be done, what requirements the product must meet, and what kind of budget you need to stay within. So even though a lawyer or legal department will do the actual negotiation, they won't know if the seller is capable of doing the job without the project manager's help.

KEY CONCEPT REVIEW



Complex projects often employ expertise from many different organizations. **Project Procurement Management** is all about how those organizations work together.

KEY CONCEPTS

We've talked about the processes you and your team will use when planning, conducting, and monitoring contracts. Now let's talk about how your approach to Procurement Management can affect the way your team delivers.

- ★ Contracts should be written so that both parties understand the deliverables and results that the buyer expects, and should be legally enforceable.
- ★ Your organization probably has documented processes and procedures surrounding the creation of contractual agreements. You should follow those guidelines.

TAILORING



Here are some factors to consider when tailoring your approach to Procurement Management:

- ★ Does the project contain multiple contracts with one seller? Or multiple contracts with multiple sellers?
- ★ Where are the sellers located? Can they communicate with you face-to-face?
- ★ What regulatory or legal considerations do you need to think about?

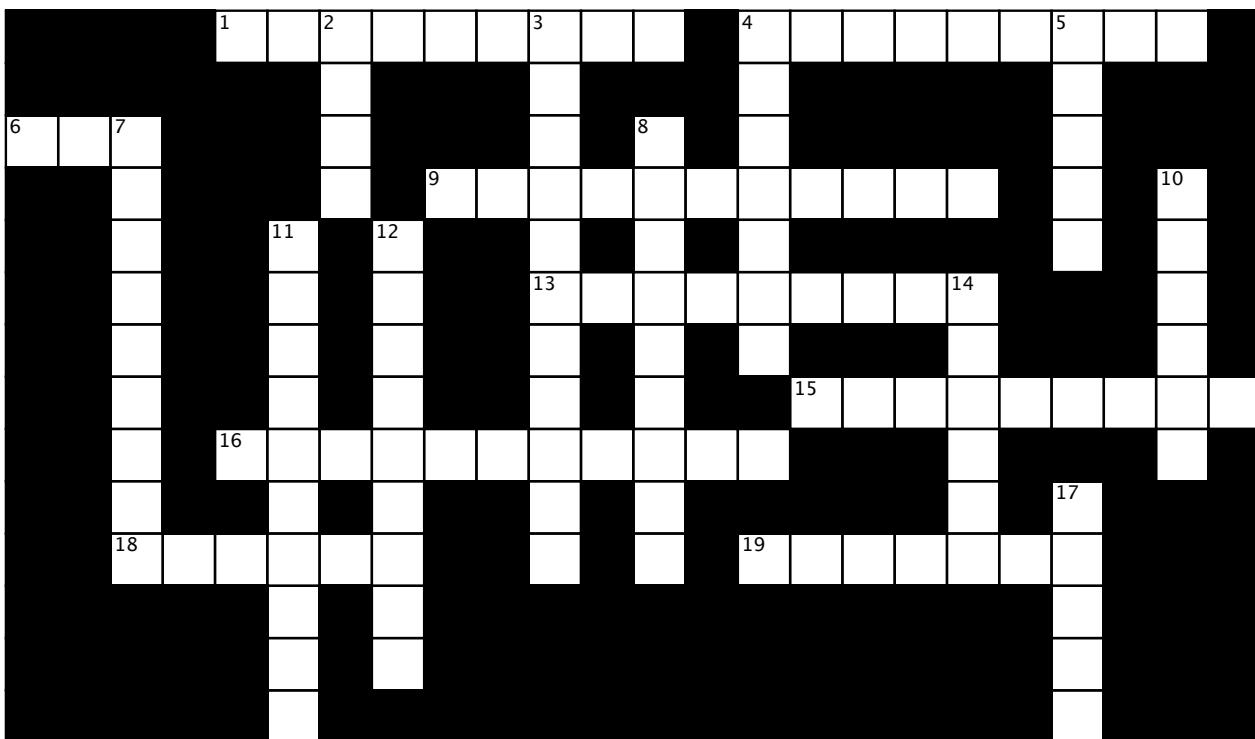
AGILE CONSIDERATIONS

Staff augmentation contracts based on time and materials are common ways of managing contracts in agile environments. Because agile teams try to adapt their scope and methods based on changes encountered during development, traditional contracts that measure performance versus known scope at the time of planning often fall short of encouraging the collaboration necessary between buyer and seller. All project teams recognize that there are risks of scope changes. But some Agile teams find a way to share that risk between buyer and seller by adding terms to their agreements that encourage the teams to adapt to change and increase collaboration.



Contractcross

Give your right brain something to do. It's your standard crossword; all of the solution words are from this chapter.



Across

1. This kind of fee is used in cost plus contracts to encourage the seller to increase performance.
4. This kind of analysis is used to determine whether to procure a service or stay within the company.
6. The _____ contract has high risk to the seller because the seller must cover costs that go beyond the price.
9. _____ documents contain all of the information the seller wants to communicate to potential buyers.
13. In a T&M contract, the buyer pays for _____, which includes equipment, office space, administrative overhead costs, and anything else (other than labor) that has to be paid for.
15. Some organizations maintain a _____ seller list consisting of sellers pre-screened based on past experience with them.
16. A buyer is sometimes required to use _____ in order to announce a project to all potential sellers.
18. The buyer selects the _____ selection criteria before contacting potential sellers.
19. The contract-related process in the Monitoring and Controlling group is called _____ Procurements.

Down

2. In this kind of contract, the seller is paid the costs as well as a fee that's determined based on the buyer's evaluation of performance.
3. The purpose of a request for _____ is to get more information on goods and services that need to be acquired.
4. A force _____ clause protects both the buyer and seller from things like war and natural disasters preventing the completion of the contract.
5. The company or organization that's procuring services.
7. The potential sellers submit seller _____ to a buyer to explain how the contract will be fulfilled.
8. A request for _____ is a document that asks sellers for the price of the work.
10. _____ Procurements is the output of Control Procurements that is created after the contracts are completed.
11. The kind of contract where the buyer pays a lump sum.
12. The procurement _____ of work defines the portion of the project's scope that the seller will work on for the contract.
14. The company or organization that's performing services for the contract.
17. A disagreement between the buyer and seller is called a _____.

→ Answers on page 682.

Kate closes the contract

The 18-month contract's ready to close! The seller did a great job handling technical support, and that gave Kate and Ben the time they needed to ramp up their own company's team and facilities.



We saw that closed procurements are an output of Control Procurements. The buyer—Kate!—provides formal written notice to the seller that the contract has been completed. This usually means all deliverables were delivered, and they pass all of the required quality checks.

Outputs



Closed procurements



Question Clinic: BYO questions



SEE IF YOU CAN COME UP
WITH QUESTIONS ON YOUR
OWN! GIVE IT A SHOT:

Write a which-is-BEST question about Perform Qualitative Risk Analysis.

See page 208.

See page 370.

Write a red herring question about Conduct Procurements.

Write a calculation question about CPI.

See page 566.

See page 294.

Write a which-comes-next question about the Scope Management processes.

HERE'S A GREAT STUDY TOOL. ANY TIME YOU GET A PRACTICE QUESTION WRONG, OR DON'T UNDERSTAND A PARTICULAR CONCEPT, WRITE A QUESTION ABOUT IT! THAT'S A GREAT WAY TO HELP YOU REMEMBER STUFF FOR THE EXAM.





Sharpen your pencil Solution

Kate has **18 months** to build up the capacity her company needs to handle all the technical support calls. See if you can figure out whether it's a better deal for Kate to make or buy.

1. If they handle the extra work within the company instead of finding a seller, it will cost an extra \$35,000 in overtime and \$11,000 in training costs in total, on top of the \$4,400 per person per month for the five-person team needed to do the extra support work. What's the total cost of keeping the work within the company?

The total cost for keeping the work is the monthly cost ($\$4,400$ per person \times 5 people \times 18 months $= \$396,000$) plus the extra costs ($\$35,000$ overtime and $\$11,000$ training costs). $\$396,000 + \$35,000 + \$11,000 = \$442,000$ total costs for keeping the work inside the company ("making").

2. Kate and Ben talked to a few companies and estimate that it will cost \$20,000 per month to hire another company to do the work, but they'll also need to spend \$44,000 in setup costs. What will contracting the work cost?

The cost for hiring another company to do the work is $\$20,000$ per month \times 18 months plus the $\$44,000$ in setup costs. $(\$20,000 \times 18) + \$44,000 = \$404,000$ total costs for contracting out the work ("buying").

3. So does it make more sense to make or buy? Why?

In this case, it makes more sense to buy because the costs of making ($\$442,000$) are greater than the costs of buying ($\$404,000$).



Sharpen your pencil Solution

Kate is putting out an RFP to find a seller to provide technical support for her company. Can you figure out which Conduct Procurements tool she's using?

1. Kate works with her company's seller evaluation committee, which follows a documented, formal evaluation review process to determine which seller should be selected for the contract.

Data analysis: proposal evaluation

2. Kate contacts an IT trade journal and places a classified ad to try to find sellers.

Advertising

3. The CEO's brother-in-law runs a company that's bidding on the contract. Kate needs to make sure he gets fair—not preferential—treatment. She doesn't want to give him an unfair advantage, but she also doesn't want to exclude him from the bidding process. So she gathers representatives from all sellers into a room where they can ask questions about the contract out in the open and hear the responses to each question.

Bidder conference

4. Kate's company takes part in an equal-opportunity program in which seller companies owned by minorities must be given notice of any RFPs. Her firm employs specific people in a department who are experienced in navigating the specific rules and regulations related to the equal-opportunity arena.

Expert judgment



Contract Magnets Solution

Which of the magnets are part of the procurement documents, and which of them are part of the source selection criteria?



Bid documents

Request for proposals

Request for more information
about goods being acquired

Notification to sellers
requesting a quotation
for fixed-price work



Source
selection
criteria

Review the SOW with the seller
to make sure it's understood

Meet with the project manager
and review project processes

Go over final pricing
plan and contract terms

Get a financial statement or
credit report and verify that
the seller is insured



Sharpen your pencil

Control Procurements is a typical Monitoring and Controlling process, which means you should be able to figure out most of the outputs. The first one's filled in—can you fill in the others?

1. **Closed procurements**
2. **Work performance information**
3. **Change requests**
4. Updates to:
Procurement documentation
5. Updates to:
Project Management plan
6. Updates to:
Project documents
7. Updates to:
Organizational process assets



Contractcross Solutions

Give your right brain something to do. It's your standard crossword; all of the solution words are from this chapter.



Exam Questions

1. Tom is a project manager for a software company. He is contracting a long-term software project with an external company. That company charges him \$20/hour per employee and \$300 overhead per month. What kind of contract is he using?

- A. FP
- B. CPAF
- C. CR
- D. T&M

2. Which of the following is NOT true about bidder conferences?

- A. All potential sellers should meet separately with the buyer.
- B. Potential sellers should ask questions in an open forum so other sellers can hear the answers.
- C. Bidder conferences are a good way to make sure sellers are treated fairly.
- D. All sellers are given the same procurement documents.

3. You work for a seller that is bidding on a contract. Which type of contract has the MOST risk for your company?

- A. CPIF
- B. T&M
- C. FP
- D. CPAF

4. Which of the following BEST describes the “point of total assumption” for a contract?

- A. The point in a cost-plus contract where the buyer assumes that the seller will need to be paid
- B. The total cost of a T&M contract
- C. The point in a fixed-price contract where the seller has to assume all costs going forward
- D. The total number of resources required for a contract

5. You’re trying to decide whether or not to contract out a construction job. To do it within your company, you will have to hire an engineer for \$35,000 and pay a construction team \$15,000 per week. A contractor quotes you a price of \$19,000 per week, and your expert agrees that you won’t find a lower price than that. The job will take 16 weeks. What’s the BEST way to proceed?

- A. Pay the contractor to do the job.
- B. Select a T&M contract.
- C. Don’t contract out the work; hire the engineer and pay the construction team to do the work.
- D. Make sure the contract has a force majeure clause.

Exam Questions

6. You're managing a project that might have to contract out work, and you're comparing the relative advantages and disadvantages of finding a seller versus having your company do the work itself. Which process are you in?

- A. Plan Procurement Management
- B. Plan Contracting
- C. Conduct Procurements
- D. Request Seller Responses

7. You're using a qualified seller list. Which process are you in?

- A. Plan Procurement Management
- B. Plan Contracting
- C. Conduct Procurements
- D. Request Seller Responses

8. You've been contracted by an industrial design firm to manage its contracting. Your client asks you to take over the negotiations for an important contract to design a new remote-control lighting system. You've narrowed it down to one seller, and now you're working with the legal department at the buyer to negotiate the terms of the contract. Which of the following BEST describes your goal?

- A. You want to get the best deal for your client by making sure the seller's price is as low as possible, no matter what it costs them.
- B. You want to get a fair deal for both the buyer and the seller.
- C. You want to make sure that the seller gets as much money as possible.
- D. You want to prolong the negotiation so that you earn a higher fee.

9. You've been contracted by a construction company to manage its contracting. It has a choice of either buying an excavator or renting it. To buy it, the company would have to pay \$105,000. The price to rent the excavator is \$5,000 per month, with a one-time service charge of \$2,000. What's the minimum number of months the company needs to use the excavator in order for it to make sense to buy it rather than rent?

- A. 8 months
- B. 16 months
- C. 21 months
- D. 25 months

10. Which of the following contracts has the MOST risk for the buyer?

- A. FP
- B. CPAF
- C. CPIF
- D. T&M

Exam Questions

11. You're managing a project that is difficult to estimate, so you don't have a good idea of when the project will end. Which of the following contracts is BEST?

- A. FP
- B. CPAF
- C. CPIF
- D. T&M

12. You're looking for a seller to do work for your project. When do you send out an RFP?

- A. After you create the procurement documents, but before you select the seller
- B. Before you plan contracting, but after you Plan Procurement Management
- C. After the bidder conference, but before you select the seller
- D. During Control Procurements

13. You're creating source selection criteria for your contract. What process are you in?

- A. Conduct Procurements
- B. Control Procurements
- C. Monitor Procurements
- D. Plan Procurement Management

14. You're managing a project when you and the seller both agree that you need to have the seller add more resources to the project in order to finish on time. The number of resources is written into the contract. What's the BEST way to proceed?

- A. Your project will be late because you can't change the contract once it's signed.
- B. You need to convince the buyer to sign a new contract.
- C. You need to use the contract change control system to make the change to the contract.
- D. You need to use claims administration to resolve the issue.

15. Which of the following BEST explains the difference between a audit and an inspection during Control Procurements?

- A. The inspection reviews the products being created, while the audit reviews the procurement process.
- B. The inspection reviews the quality, schedule, and cost performance versus the initial contract, while the audit reviews how well the procurement process is going.
- C. The audit reviews the products being created, while the inspection is used to examine which resources should be assigned to which tasks.
- D. The audit reviews the products being created, while the inspection is used to examine successes and failures and gather lessons learned.

Answers

~~Exam Questions~~

1. Answer: D

This contract is a time and materials contract. It's charging a rate for labor and overhead for materials.



Eliminating the wrong answers works really well with questions like this.

2. Answer: A

One of the most important things about a bidder conference is that no one seller is given better access to the buyer. They should all have the same opportunity to gather information, so that no single seller is given preferential treatment.



Sellers should meet in the same room, and any time one of them asks the question, everyone else should hear the answer.

3. Answer: C

A fixed-price contract is the riskiest sort of contract for the seller. That's because there's one price for the whole contract, no matter what happens. So if it turns out that there's a lot more work than expected, or the price of parts or materials goes up, then the seller has to eat the costs.

4. Answer: C

This is just the definition of the point of total assumption.

5. Answer: C

This is a simple make-or-buy decision, so you can work out the math. The contractor's quote of \$19,000 per week for a 16-week job means that buying will cost you $\$19,000 \times 16 = \$304,000$. On the other hand, if you decide to keep the work in-house, then it will cost you \$35,000 for the engineer, plus \$15,000 per week for 16 weeks: $\$35,000 + (16 \times \$15,000) = \$275,000$. It will be cheaper to make it rather than buy it!

OH, I GET IT - I JUST HAVE TO FIGURE OUT HOW MUCH IT COSTS TO MAKE IT OR BUY IT, AND CHOOSE THE LOWER NUMBER!



Answers~~Exam Questions~~**6. Answer: A**

This question describes make-or-buy analysis, which is part of the Plan Procurement Management process.

7. Answer: C

One of the most important things that you do when you're finding sellers during the Conduct Procurements process is to select the sellers that will do the work. And the qualified seller list is an input that you use for that.

8. Answer: B

Your company should already have
a qualified seller list on file.

One of the most important parts of Procurement Management is that both the buyer and the seller want to feel like they're getting a good deal. Every procurement should be a win-win situation for both parties!

9. Answer: C

This may look like a tough problem, but it's actually pretty easy. Just figure out how much the rental would cost you for each of the answers:

- A. 8 months $8 \text{ months} \times \$5,000 \text{ per month} + \$2,000 \text{ service charge} = \$42,000$
- B. 16 months $16 \text{ months} \times \$5,000 \text{ per month} + \$2,000 \text{ service charge} = \$82,000$
- C. 21 months $21 \text{ months} \times \$5,000 \text{ per month} + \$2,000 \text{ service charge} = \$107,000$
- D. 25 months $25 \text{ months} \times \$5,000 \text{ per month} + \$2,000 \text{ service charge} = \$127,000$

Now look at what the excavator would cost for 25 months. It would cost \$105,000 plus \$20,000 for the maintenance costs, for a total of \$125,000. So at 25 months, the excavator is worth buying—but before that, it makes more sense to rent.

10. Answer: D

If this seems a little out of place, remember that renting equipment is a kind of contract, and the same kind of make-or-buy decision is necessary.

The time and materials (T&M) contract is the riskiest one for the buyer, because if the project costs are much higher than the original estimates, the buyer has to swallow them, while the seller keeps getting paid for the time worked.

Answers

~~Exam Questions~~

11. Answer: D

Both cost-plus and fixed-price contracts are based on the idea that you know how long the contract is going to last. A seller would only agree to a fixed-price contract if there's a good idea of how much it's going to cost. And a cost-plus contract will hurt the buyer if it goes over. Only the time and materials contract will give both the buyer and seller a fair deal if neither has a good idea of how long the work will take.



That's the only time you really should
use a T&M contract.

12. Answer: A

Contracting is a pretty linear process—first you plan the contract, then you put together a package of procurement documents to send to potential sellers, and then you select a seller and start the work. So you send out a request for proposals after you've put together the procurement document package so that you can select a seller for the job.

13. Answer: D

You put together the source selection criteria as part of the Plan Procurement Management process. That way, you can use the criteria when you're looking at the responses you get from sellers.

14. Answer: C

You can always change a contract, as long as both the buyer and the seller agree to it. When you do that, you need to use the contract change control system—just like with any other change.



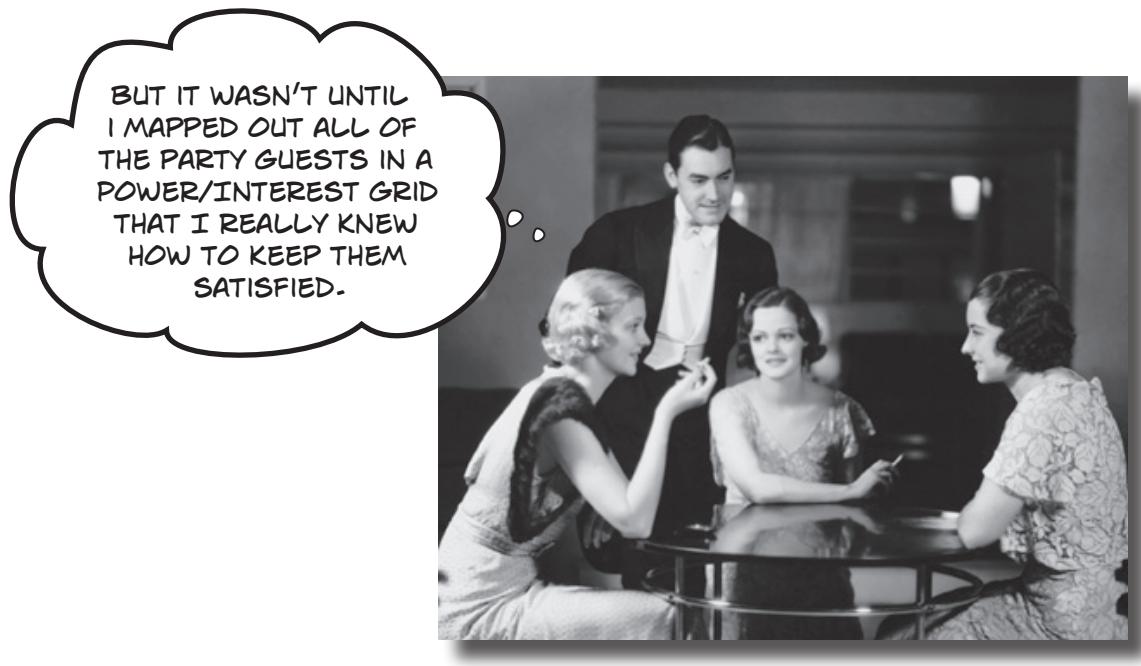
This is not what claims administration is for. Since the buyer
and seller agree, there is no claim.

15. Answer: B

It's easy to get mixed up with all of these tools for controlling procurements, but if you think about how they're used, it gets less confusing. Remember, inspections are for figuring out if the seller is meeting your agreements. Audits are about making sure the contract is following the procurement process as you would expect.

13 Stakeholder management

Keeping everyone engaged



Project management is about knowing your audience. If you don't get a handle on the people who are affected by your project, you might discover that they have needs you aren't meeting. If your project is going to be successful, you've got to satisfy your stakeholders. Luckily, there's the **Stakeholder Management** knowledge area, which you can use to understand your stakeholders and figure out what they need. Once you really understand how important those needs are to your project, it's a lot easier to **keep everyone satisfied**.

Party at the Head First Lounge (again)!

When we last saw Jeff and Charles in Chapter 10, they were just about to have their grand opening party. How's that going for them?



Look at those retro clothes and hairstyles! They really put a lot of effort into it.

Not everybody is thrilled

There were a few people who weren't quite as enthused about the opening party for Head First Lounge as Jeff and Charles were. Can you use the four **Stakeholder Management** processes to help them get their party on track?

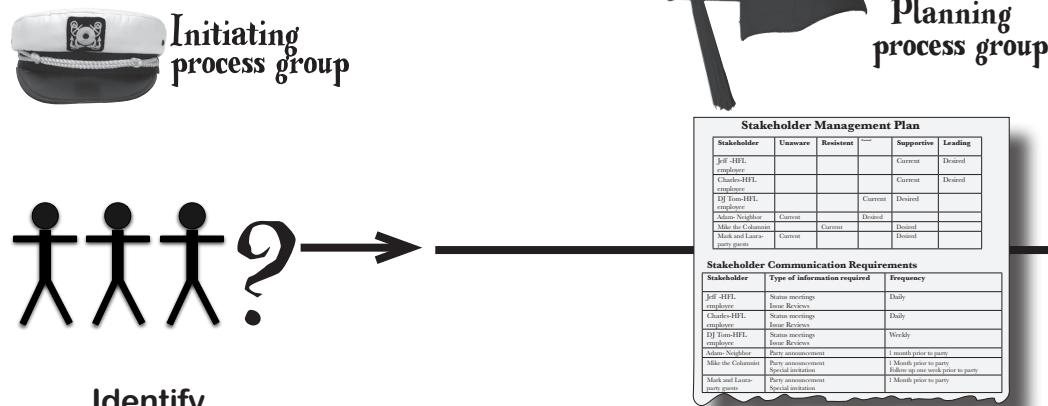


What can Jeff and Charles do to get a handle on their stakeholder problems?



Understanding your stakeholders

When you think about it, there are a lot of people who have an interest in your project. That obviously includes the sponsor who's paying for it, the team who's making it, and the people who will support it. But there are people who aren't so obvious who have a stake in your project as well. If you don't pay attention to all of your stakeholders, you could find that you don't meet their needs, and that can cause your project to run off the rails. The **Stakeholder Management** processes are here to help you figure out who your stakeholders are, plan how you'll keep them engaged, and manage your project to keep them satisfied.



Identify Stakeholders

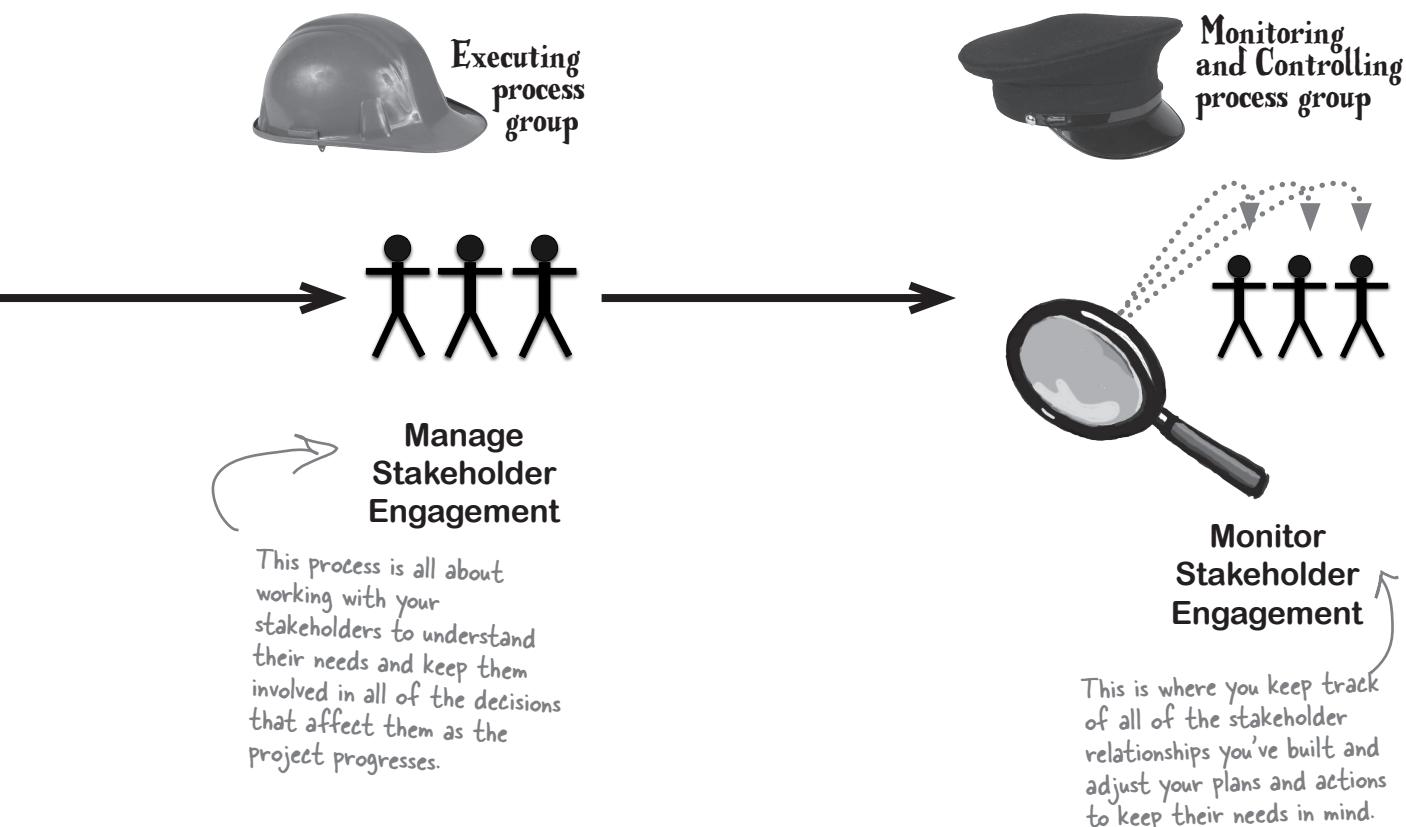
You need to spend a little time figuring out who your stakeholders are before you can do anything else. That's why this one is an Initiating process.

Plan Stakeholder Engagement

Here's where you figure out what your stakeholders' current level of engagement is, and plan how you'll get them to support your project.

Stakeholder Management makes sure you know who you need to engage to keep your project on track.

Stakeholder requirements and expectations sometimes change over the course of the project. Monitor Stakeholder Engagement makes sure you stay on top of those changes and adjust your plans accordingly.



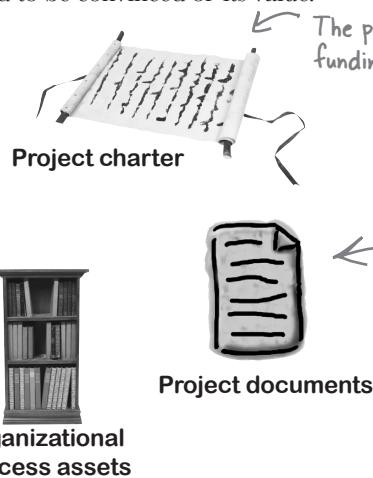
Find out who your stakeholders are

One of the first things you need to do when you start a project is to figure out who your stakeholders are and what you need to do to keep them all in the loop. The **Identify Stakeholders** process is all about writing down your stakeholders' names along with their goals, expectations, and concerns in a document called the **stakeholder register**. Most projects succeed or fail based on how well the project manager knows and manages stakeholder expectations. Writing them down up front will help you to come up with a strategy to identify the people who could impact your project, but still need to be convinced of its value.

Knowing the way your company runs should help you to find the people who will be impacted by your project.



Enterprise environmental factors



The project charter will tell you who's funding and championing the project.



Organizational process assets



Project documents



Project Management plan



Business documents



This includes the change log, issue log, and requirements documents.

Inputs

Tools

Data analysis: stakeholder analysis

Data analysis: stakeholder analysis is a critical tool in this process. You need to interview all of the stakeholders you can find for your project, and determine the value the project has for them. As you sit with stakeholders, you'll identify more people to interview.

During stakeholder analysis, you can divide your stakeholders into groups based on their level of involvement and need for communication. When you understand what motivates all of your stakeholders, you can come up with a strategy to make sure that they're told about the things they find important, and that they're not bored with extraneous details.

Meetings are...well, they're ordinary meetings. You know how meetings work.

Data analysis: document analysis

analysis is about looking at the project documents to find the stakeholders for your project.

Expert judgment in this process means talking to all of the experts on your project to identify more stakeholders, and learn more about the ones you've identified.

Data gathering: questionnaires, surveys, and brainstorming

are the ways you get your team to think of people who should be added to the stakeholder register.

You'll see examples of this in the next few pages.

Data representation: stakeholder mapping/representation

Behind the Scenes



Stakeholders are really important when you're initiating a project. In Chapter 4 we learned about the business case document, which determines why the benefits of the project are worth the cost. How do you build that document? By working with stakeholders to analyze the benefits of the project, because the stakeholders are the people who understand the organization's strategy, and can evaluate the expected business value of the project.

So what happens after the project charter is approved? The charter contains project requirements, milestones, and other important information about what the team will deliver. But it's not enough to simply write it down. You need to communicate with the stakeholders to make sure they understand what's in the charter, and their responsibilities.



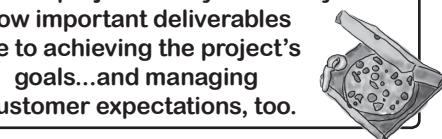
Stake-hold-er, noun

A person who has an interest or concern about something.

Tom was a stakeholder in the Little League game since his son was playing in it.

The PMBOK® Guide defines the term stakeholder a little more specifically than its everyday use: "An individual, group, or organization that may affect, be affected, or perceive itself to be affected by a decision, activity, or outcome of a project, program, or portfolio." (PMBOK® Guide, 6th edition, page 723)

Stakeholders have a lot of influence over project deliverables, and often provide business requirements when you're identifying the key deliverables for the project. And you already know how important deliverables are to achieving the project's goals...and managing customer expectations, too.



Outputs



The classification tells you whether the stakeholder is internal or external, but also whether he's a supporter, resistor, or neutral participant in the project.



Project documents updates



Change requests



Deliverables

Project Management plan updates

The register should tell you what individual stakeholders get out of the project so that you can help them to see the value in the project.

Stakeholder Register

Name: Mike the Columnist

Role: Press

Responsibilities:

- Attend the party
- Write a column about it

Requirements:

- Compare this party with the other lounge parties in town
- Get free drinks

Expectations:

- Head First Lounge will have a first-rate sound system

Classification:

- External/Neutral

**Flip the page to learn more about the stakeholder register.



Stakeholder analysis up close

When you get started on your project, the first thing you should do is examine the charter and any contract information you have to figure out who will be impacted by it. Once you have a preliminary list of stakeholders, you should sit down with each one of them and figure out their responsibilities, goals, expectations, and concerns. These interviews will be the basis for the stakeholder profiles in your stakeholder register. As you interview people, you'll likely find more stakeholders to include in the list.

Name: Adam

Group: Neighbors

Responsibilities:

- None

Requirements

- Peacefully coexist with Head First Lounge
- Read a book on the stoop
- Drink some coffee

Expectations:

- Head First Lounge will not be so loud as to disrupt normal activities.

Classification:

Name: DJ Tom

Group: Head First Lounge Employees

Responsibilities:

- Play the music for the lounge party
- Keep up with the crowd's mood and make sure everybody has fun
- Play new and interesting music that the group will like

Requirements:

- Build a reputation as a good DJ
- Get hired back for another gig later

Expectations:

- Head First Lounge will have a first-rate sound system
- Head First Lounge will advertise the event and have a full house

Name: Mike the columnist

Group: Press

Responsibilities:

- Attend the party
- Write a column about it

Requirements:

- Compare this party with the other lounge parties in town
- Get free drinks

Expectations:

- Head First Lounge will have a first-rate sound system
- Head First Lounge will be different from the rest of the downtown nightlife spots

Classification:

- External/Resistant

It's useful to group stakeholders together, because stakeholders in a particular group tend to have similar needs and project interests.

At first, it may sound like "requirements" and "expectations" are the same thing, but it's useful to make a distinction. Requirements are what someone needs to get out of your project, while expectations are what they think will actually happen.

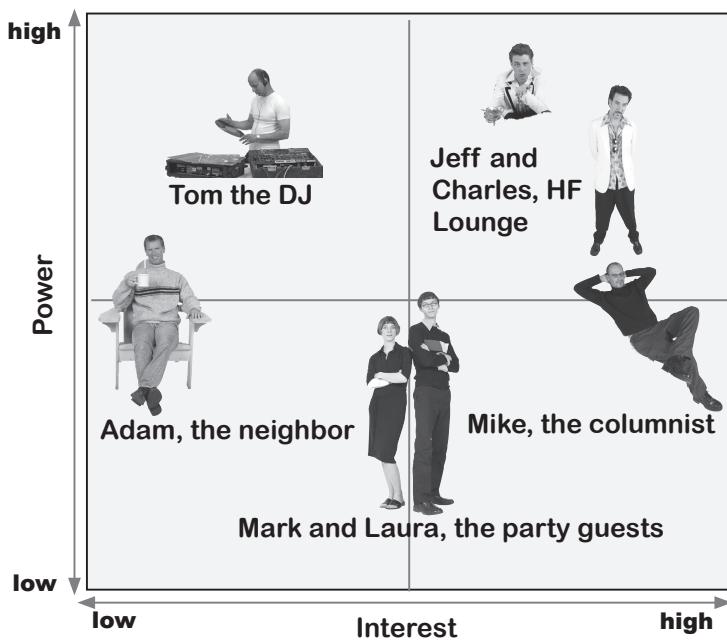
It's easy to imagine a stakeholder with high hopes but little actual expectation of seeing them realized.

Once you've got a handle on your stakeholders' concerns, you can start making headway addressing them. That's how you turn a negative stakeholder into an advocate!

One way to get a handle on how to communicate with your stakeholders is to create a **power/interest grid**. When you plot your stakeholders on a power/interest grid, you can determine who has high or low power to affect your project, and who has high or low interest. People with high power need to be kept satisfied, while people with high interest need to be kept informed. When a stakeholder has both, make sure you manage her expectations very closely!

People with **high power and low interest** need to be kept in the loop. You need these people to be **kept satisfied** with the project, even if they aren't interested in it.

The people who are **high power and high interest** are the decision makers who have the biggest impact on project success, so **closely manage** their expectations.



You shouldn't have to worry too much about the people with **low interest and low power**, so you simply monitor them.

Folks with **high interest and low power** should be kept in the loop as the project progresses. If they're **kept informed**, your project will get good buzz.



What effect would a **resistant** stakeholder have on your project? What about a **neutral** one?



This is the Plan Stakeholder Engagement process. You've seen a lot of planning processes now. Can you fill in the inputs and outputs for this one?

Inputs



Here's where your company keeps all of its templates and lessons learned.



Here's where you use all of the planning you've done for all of the knowledge areas in your project so far.

This one will help you manage stakeholder engagement if your project includes contracting work.

Tools

Data gathering: benchmarking means taking stock of how other organizations have managed stakeholder engagement for successful projects.

Data analysis: assumption and constraint analysis, and root-cause analysis

analysis, means understanding what you already know and can assume about the stakeholders in your stakeholder register and their levels of support for the project. It also means figuring out the reasons that might be behind the level of support you're getting from the stakeholders you've identified.

Data representation: mind mapping and the stakeholder engagement assessment matrix

assessment matrix are all about visualizing the relationships between stakeholders and their interests.

Decision making includes (but isn't limited to) voting, and also the same kind of multicriteria decision analysis we talked about in Chapter 8.

You need to know who you're going to communicate with. Here's where you'll find all of the work you've written down for the project so far.

Here's where you'll find the project's purpose and objectives.



Expert judgment in this process means talking to all of the experts on your project to identify more stakeholders, and learn more about the ones you've identified.



Meetings are a great tool for getting everyone together to think through the stakeholders who might be impacted by your project.

↓
Outputs

Are you surprised at how much of this process you can fill in? Looks like you're getting the hang of this stuff!

Before you turn the page, take a minute and think of three examples of how you used each of these methods on your last project. That'll help you remember them for the exam!

→
There is only one output. Can you guess what it is?



Exercise Solution

Inputs



Enterprise environmental factors

Organizational process assets

Project Management plan

Project documents

Project Charter

Agreements

This is the Plan Stakeholder Engagement process. You've seen a lot of planning processes now. Can you fill in the inputs and outputs for this one?

Tools

Data gathering: benchmarking means taking stock of how other organizations have managed stakeholder engagement for successful projects.

Data analysis: assumption and constraint analysis, and root-cause analysis, means understanding what you already know and can assume about the stakeholders in your stakeholder register and their levels of support for the project. It also means figuring out the reasons that might be behind the level of support you're getting from the stakeholders you've identified.

Data representation: mind mapping and the stakeholder engagement assessment matrix are all about visualizing the relationships between stakeholders and their interests.

Decision making includes (but isn't limited to) voting, and also the same kind of multicriteria decision analysis we talked about in Chapter 8.



Meetings

Meetings are a great tool for getting everyone together to think through the stakeholders who might be impacted by your project.



Expert judgment in this process means talking to all of the experts on your project to identify more stakeholders, and learn more about the ones you've identified.



Think about everyone who's involved in the project, and try to come up with a plan for how to engage them.

The plan says how you will distribute the information, to whom, and how often.

The levels of engagement Jeff and Charles used to understand their stakeholders are:

Unaware: The stakeholder doesn't know that the project is happening.

Resistant: The stakeholder doesn't want the project or decision you're making to happen.

Neutral: The stakeholder is fine with the project or decision no matter how it turns out.

Supportive: The stakeholder wants your project or decision to succeed.

Leading: The stakeholder is actively helping the project to succeed.

Stakeholder Management Plan

Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
Jeff—HFL employee				Current	Desired
Charles—HFL employee				Current	Desired
DJ Tom—HFL employee			Current	Desired	
Adam—Neighbor	Current		Desired		
Mike—Columnist		Current		Desired	
Mark and Laura—party guests	Current			Desired	

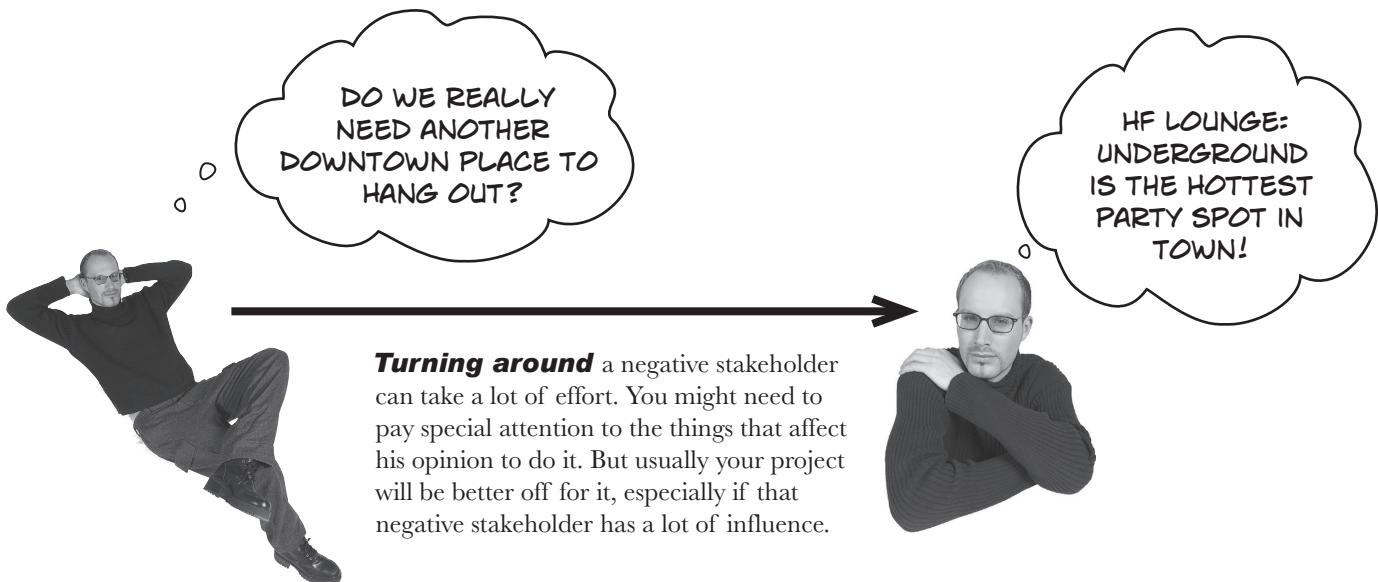
Stakeholder Communication Requirements

Stakeholder	Type of information required	Frequency
Jeff—HFL employee	Status meetings Issue reviews	Daily
Charles—HFL employee	Status meetings Issue reviews	Daily
DJ Tom—HFL employee	Status meetings Issue reviews	Weekly
Adam—Neighbor	Party announcement	One month prior to party
Mike—Columnist	Party announcement Special invitation	One month prior to party Follow up one week prior to party
Mark and Laura—party guests	Party announcement Special invitation	One month prior to party

How engaged are your stakeholders?

It's not enough to know who your stakeholders are—you need to understand what motivates them, and what it will take to make the project a success for each of them. That's where the **stakeholder engagement assessment matrix** comes in. Jeff and Charles sat down and worked to come up with one for their upcoming party. Here's what it looked like:

Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
Jeff—HFL employee				Current	Desired
Charles—HFL employee				Current	Desired
DJ Tom—HFL employee			Current	Desired	
Adam—Neighbor	Current		Desired		
Mike—Columnist		Current		Desired	
Mark and Laura—party guests	Current			Desired	



Turning around a negative stakeholder can take a lot of effort. You might need to pay special attention to the things that affect his opinion to do it. But usually your project will be better off for it, especially if that negative stakeholder has a lot of influence.



Exercise

Choose which engagement level applies in each situation.

1. Jeff and Charles haven't reached out to the caterer yet, but they hope to get his help at a discount.

Unaware Resistant Neutral
 Supportive Leading

2. The sound engineers are already booked for that night. They're going to charge an extra fee if you want them to come help out.

Unaware Resistant Neutral
 Supportive Leading

3. The liquor distributor usually has no trouble accommodating double and triple orders.

Unaware Resistant Neutral
 Supportive Leading

4. The neighborhood business association asked about a place to celebrate the past year's successful programs, and a Head First Lounge party sounds like just the thing for them.

Unaware Resistant Neutral
 Supportive Leading

5. A local event magazine was so happy with the last Head First Lounge party that they've offered to partially sponsor this one.

Unaware Resistant Neutral
 Supportive Leading

6. The neighbors haven't been told that HFL is planning another party. We probably ought to let them know way in advance.

Unaware Resistant Neutral
 Supportive Leading

→ Answers on page 718.



Think about a major project you've worked on where there were a large number of stakeholders. Where was their engagement level at the beginning of the project? Where did it end up?

there are no **Dumb Questions**

Q: How do I figure out who all of my stakeholders are?

A: The short answer is: *look around*. You probably can name the majority of the stakeholders on your project right off the top of your head. You'll surely know who the sponsor is; you can point to her name right on the charter. Then there's the team that's doing the work; you'll know who they are because you work with them every day. From there, it gets a little harder. Any business partners (like trainers or support people for software packages) that your company has contracted to help out with the project are also stakeholders. Consultants or other vendors you might've contracted to help you deliver your product will also be stakeholders. Then you'll have to think about how the product of your project will affect the rest of your company. Will it change the way people work when it's complete? How will those people who need to change their work feel about the project if you asked them today? They're stakeholders, too. If you're thorough, the list might get pretty long, but it's much better to think about your stakeholders up front than it is to ignore them. A stakeholder you don't plan for today could cause a lot of turbulence in your project later.

Q: Explain the point of that power/interest grid again.

A: Different people have different perspectives on your project. Some of them will put a lot of time and effort into making your project succeed, while others will not have the spare cycles to give. And some people might even actively work against your project if they don't understand it. The power/interest grid is there to help you understand how you should approach the stakeholders for your project. If someone without a lot of power to influence your project doesn't have the time or the will to help you with it, that's less of a problem than when someone with a lot of power to affect your project is resistant to it. It's a tool to help you figure out the best approach to managing all of the stakeholders on your project. It will help you choose the right way to influence the people who can help you succeed.

Q: How do I turn around resistant stakeholders?

A: In many cases, they're resistant for a good reason. The best approach is really to try to understand why they're resistant and help them to see the benefits of your project. Many times, stakeholders who are resistant to change have good suggestions that can make the project better in the long run.

Q: What does it mean to have a stakeholder in a leading role?

A: When a stakeholder takes on a leading role, he is actively involved in making sure your project is a success. He may go to meetings and convince others to support the project, and help you to clear any obstacles that might jeopardize your project's goals. When a stakeholder has a leading role in the project, he has a stake in seeing it succeed. Leading stakeholders are willing to put time and energy into making sure that others support the project.

There are five engagement levels for stakeholders: unaware, resistant, neutral, supportive, and leading.

Managing stakeholder engagement means clearing up misunderstandings

As your project progresses, you'll need to check in with your stakeholders regularly so that misunderstandings don't develop. Your job is to help them to take part in the decisions the team is making, so that they can be supportive. When a stakeholder is resistant to change, you'll need to negotiate with her and understand her resistance so that you can take her perspective into account.

Sometimes a stakeholder you don't always talk to might have a good suggestion for an improvement that can help the whole team. It's also possible that there are some facts about the project that the stakeholder hasn't considered, and you can help him to be better informed. The key to success in Stakeholder Management is being inclusive, and sharing information with everyone who's impacted by the project's outcome.



Jeff and Charles didn't realize that they scheduled their party on the same day as another music event that was happening in the city. The sound engineers needed to bring in extra help to handle both events, and that's why they were charging a bigger fee. Once you found out what the issue was and communicated it back to the Head First Lounge team, they understood the cost and approved it.



The **Manage Stakeholder Engagement** process is a typical Executing process. You already know the inputs, tools and techniques, and outputs! See if you can figure out what they do just from their names. Write down a description for each of them, and then flip the page to see if you're right.

Inputs



Enterprise
environmental
factors



Organizational
process assets



Project
documents

This includes a log of changes that happen on your project. You need to make sure your stakeholders are aware of them, because they really don't like being blindsided by changes.

We just covered this in Chapter 10.

Tools

Communication skills

.....
.....
.....
.....

Interpersonal and team skills

.....
.....
.....
.....



Since the Manage Stakeholder Engagement process is all about resolving issues that the stakeholders experience, the tools are focused on communicating with the stakeholders about those issues.

Expert judgment means using expert knowledge in politics, communication strategies, and managing people's interests.

Ground rules are set to let everyone know what's expected from project team members and other stakeholders throughout the project.

Meetings are a way to get everyone together to make decisions and respond to changes that occur during the project.

Outputs



Change requests

Project document updates

.....
.....
.....

How will the outputs be used to communicate with stakeholders?
Don't forget that every team member is a stakeholder!

Project Management plan updates

.....
.....



The **Manage Stakeholder Engagement** process is a typical Executing process. You already know the input, tools and techniques, and outputs! See if you can figure out what they do just from their names. Write down a description for each of them.

Inputs



Project Management plan



Enterprise environmental factors



Organizational process assets

Tools

Communications skills

This is where you decide how you'll keep people in the loop using push methods, interactive methods, or pull methods.



Project documents

Interpersonal and team skills

This is where you use your "soft skills" to keep everybody on track and working toward the same goal.

When your stakeholders have a high degree of influence over your project, it's extremely important to maintain a good relationship with them. The Stakeholder Management plan is a valuable tool for this, and following it will help you manage your stakeholders' expectations so that you can receive continued support from them.



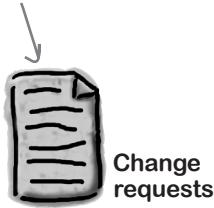
An important part of a project manager's job is helping to manage the flow of information, and keeping stakeholders engaged and informed is a large part of how the project manager does that. Following the Communications Management plan is an effective tool for keeping information flowing to stakeholders.

Expert judgment means using knowledge in politics, communication strategies, and managing people's interests.

Ground rules are set to let everyone know what's expected from project team members and other stakeholders throughout the project.

Meetings are a way to get everyone together to make decisions and respond to changes that occur during the project.

These are any changes to the project plan or other documents that involve stakeholder communication.



Outputs



Project document updates

These are any updates to previously written project documents that come from the Manage Stakeholder Engagement process.

Project Management plan updates

Approved changes actually need to be made to the project plan.

Monitor your stakeholders' engagement

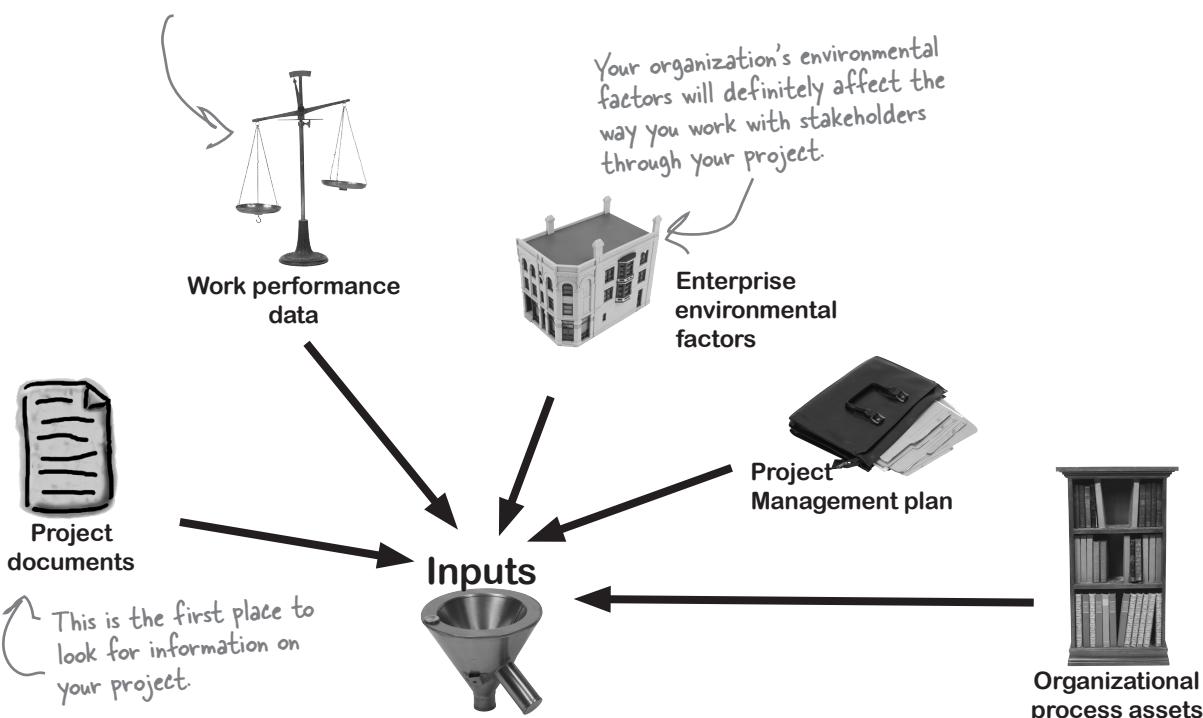
Now that you've got a great framework set up for managing the way your stakeholders interact with your project, you need to monitor those interactions to make sure that everybody stays in the loop. When you run into a problem or find a place where you might be able to bring the project closer to meeting a stakeholder's goal, you can make course corrections and changes to keep as many of your stakeholders satisfied as possible—and that's what the **Monitor Stakeholder Engagement** process is all about.



Monitoring
and Controlling
process group

Once you know what your stakeholders' requirements are, you can monitor how close or far away your project is from meeting them.

This is all of the data about how your project is progressing. You can use it to make forecasts and tell how close you are to meeting your stakeholders' goals.





Sharpen your pencil

Can you figure out what each of the **Monitor Stakeholder Engagement** tools and techniques is for, just from the name?

Tools

Data analysis

Decision making

Data representation

Communication skills

Interpersonal and team skills

Meetings

—————> Answers on page 715.

Now you can tell when you need to change the way you deal with stakeholders

Now that you've taken a look at all of the data coming from your project, you're in a better position to tell if you need to make changes to the way you're managing stakeholder engagement. The **outputs from Control Stakeholder Engagement** are all about making changes to the documents you've been using to keep them engaged all along.



Work performance information is the analyzed work performance data, changed from raw data into reports that are understood in context and can be used to make project decisions. Where work performance data was the raw outputs of the various controlling processes, the work performance information is consolidated. Think of work performance data as your raw budget performance data (this month, we're over budget by \$1,000) and work performance information as that data in context (the project budget forecast is currently \$10,000 under budget, even though we're over by \$1,000 this month).

Project Management plan

updates might be needed as you work with your stakeholders to ensure successful delivery. Your stakeholders might request changes to your overall strategy for any of the knowledge areas you've planned as part of your Project Management plan. You'll need to go back and make updates to those plans if you want to keep everyone in the loop about the change in approach.

Change requests happen as part of controlling stakeholder engagement. What do you do if you find out that one of your stakeholders' requirements has been missed? You put the **change request** in as soon as possible.

Project documents updates happen as you work with your stakeholders to monitor and control their engagement. You might find new stakeholders along the way who make you update your **stakeholder register**. You could also run into issues that need to be added to the **issue log**. This also includes updates to **lessons learned**.

You already know how important lessons learned are for helping your team and your company continue to improve, and stakeholders are a really valuable source for them. That's why it's critical to work with stakeholders to capture, analyze, and manage lessons learned. And it's why the communication techniques in Chapter 10 are so valuable to project managers for gathering and documenting lessons learned.

Pooł Puzzle

stakeholder management

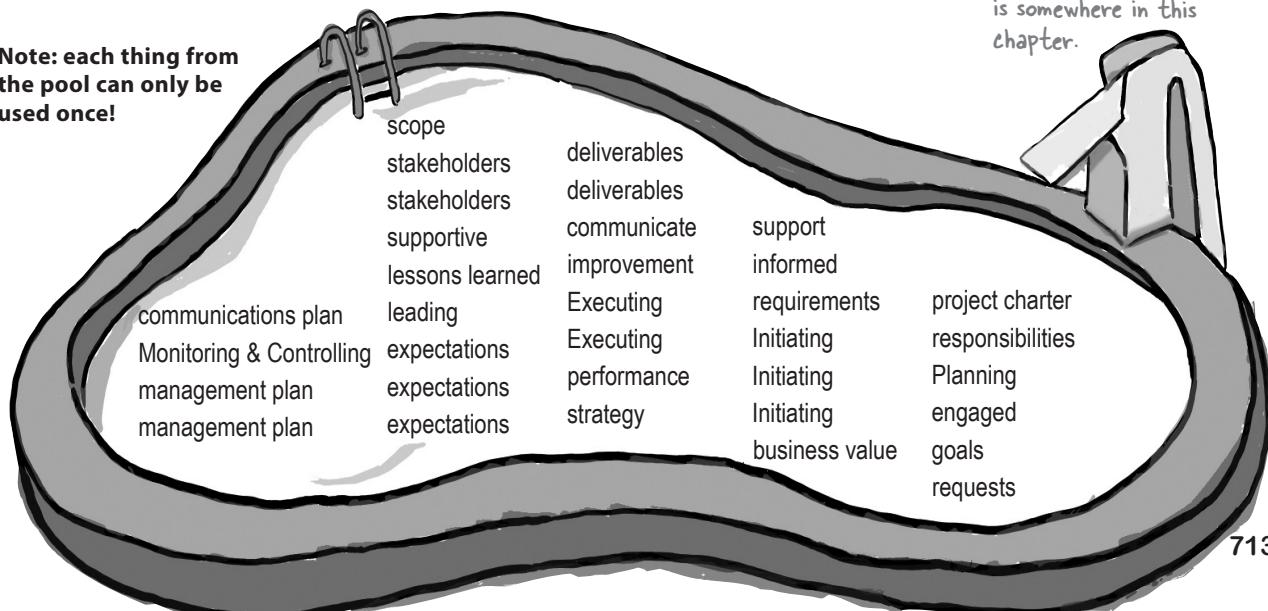


Here's a chance to test your knowledge while getting some insight into how the exam works. Here are seven tasks from the specification PMI created for the PMP exam that have to do with Stakeholder Management with some words or phrases blanked out. Your **job** is to take words or phrases from the pool at the bottom of the page and place them into the blank lines in the tasks. You may **not** use the same word or phrase more than once, and you won't need to use all of them. Can you use everything you've learned to reproduce part of the PMP exam specification?

- ★ Identify key _____ based on business _____ in order to manage customer _____ and direct the achievement of project _____. (_____ process group)
- ★ Conduct benefit analysis with relevant _____ to validate project alignment with organizational _____ and expected _____. (_____ process group)
- ★ Inform _____ of the approved _____ to ensure common understanding of the key _____, milestones, and their roles and _____. (_____ process group)
- ★ Develop the stakeholder _____ by analyzing needs, interests, and potential impact in order to effectively manage stakeholders' _____ and engage them in project decisions. (_____ process group)
- ★ Manage the flow of information by following the _____ in order to keep stakeholders _____ and _____. (_____ process group)
- ★ Maintain stakeholder relationships by following the stakeholder _____ in order to receive continued _____ and manage _____. (_____ process group)
- ★ Capture, analyze, and manage _____, using lessons learned management techniques in order to enable continuous _____. (_____ process group)

This is all review! All of the missing information is somewhere in this chapter.

Note: each thing from the pool can only be used once!





Pool Puzzle Solution

Were you able to figure these tasks from the PMP exam specification? They all have to do with Stakeholder Management. This is a really good way to prepare for the PMP exam, because the exam questions typically don't use exactly the same wording as the *PMBOK® Guide*. This puzzle helps you learn to use different wording to describe concepts that will appear on the exam.

You can find the complete PMP exam specification by searching for "PMP examination content outline" on the Project Management Institute website: <https://www.pmi.org>.

- ★ Identify key deliverables based on business requirements in order to manage customer expectations and direct the achievement of project goals. (Initiating process group)
- ★ Conduct benefit analysis with relevant stakeholders to validate project alignment with organizational strategy and expected business value. (Initiating process group)
- ★ Inform stakeholders of the approved project charter to ensure common understanding of the key deliverables, milestones, and their roles and responsibilities. (Initiating process group)
- ★ Develop the stakeholder management plan by analyzing needs, interests, and potential impact in order to effectively manage stakeholders' expectations and engage them in project decisions. (Planning process group)
- ★ Manage the flow of information by following the communications plan in order to keep stakeholders engaged and informed. (Executing process group)
- ★ Maintain stakeholder relationships by following the stakeholder management plan in order to receive continued support and manage expectations. (Executing process group)
- ★ Capture, analyze, and manage lessons learned, using lessons learned management techniques in order to enable continuous improvement. (Monitoring & Controlling process group)

Note: each thing from the pool can only be used once!

