Creating the WBS and Communicating the Plan

The following exercises are presented here:

- Exercise 4.1: Creating the Work Breakdown Structure
- Exercise 4.2: Planning Communications with Your Stakeholders
- Exercise 4.3: Planning for Quality
- Exercise 4.4: Using Quality Planning Tools
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Exercise 4.1: Creating the Work Breakdown Structure

The objectives for this exercise are as follows:

- Describe the need for a work breakdown structure.
- Describe the essential elements of a work breakdown structure.
- Create a work breakdown structure.

Background

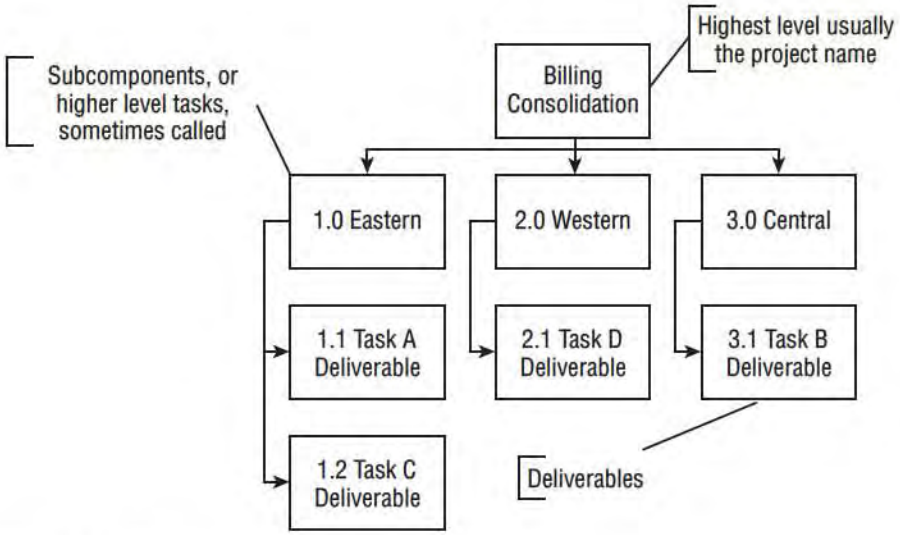
A work breakdown structure (WBS) is a scope management document used to decompose project scope components into smaller, more manageable components or work packages. The project manager creates it with project team members, and it has many purposes. The WBS helps identify the major deliverables of the project. It also creates a total view of the project in small, manageable components. Finally, it helps create a common understanding of the project deliverables.

A WBS is composed of two elements. The first is levels of work; there are three. The highest level is usually the project name or the product, service, or result of the project. Intermediate levels of work, sometimes called *summary tasks*, are subcomponents of the highest-level tasks. There can be several levels of intermediate components. Intermediate-level or summary components are used to sum up the type of components below them. Summary tasks help you categorize your thoughts. Here are some examples of possible components:

- Major deliverables
- Geographic boundaries
- Phases
- The departments of the organization

You want your first set of components to be at the deliverable level. The other levels of components can capture the other three bullet items just covered. Finally, work packages are the lowest level of work.

The other element of the WBS is a unique number identifier.
The following shows the three levels of work and the unique number identifiers.



Creating a WBS involves eight steps:

1. Determine the format. You can use either a tree structure or an outline.
2. Consider how many levels of decomposition might be appropriate for your project.
3. Determine how the levels of the WBS will be organized.
4. Label the first level the project name.
5. At the second level, decompose the project into a set of deliverables, phases, or whatever you think is appropriate.
6. For each subsequent level, decompose the level above into smaller components.
7. Create the lowest level of decomposition. This level, called the *work package*, should be small enough to easily assign to one person to complete. You also will be able to easily create time and cost estimates for this level.
8. Create a unique numerical identifier for each component on the work breakdown structure. The numbering scheme often emulates the levels in a numbered outline (for example, 1.0, 1.1, 1.1.2, and so on).

In this exercise, you'll create a WBS in order to help a client reach its goals with a credit card validation project.

Scenario

Your company has just placed you at SystemsDelivery, Inc., as a temporary project manager. You've been assigned the credit card validation project. This project is designed to be the next big thing in credit card fraud prevention. The management of SystemsDelivery believes that this product will be in high demand at every major retailer in the country. Of course, the management needs this product to go to market as quickly as possible. On your first day, the project

sponsor hands you several documents about the project. One of these documents is a scope statement the last project manager created before he quit. The scope statement includes the following items:

- The validation system will be housed in a device that attaches to all electronic cash registers.
- The validation system must be updated daily using wi-fi technology.
- The validation system contains both software and hardware components.
- The validation system must validate a credit card in 30 seconds or less.
- The validation system must be ready for the American market first, Canadian second, and European third.
- Different devices and software will be needed for each market.

Testing Your Knowledge of Creating a WBS

Use the scope information provided for the credit card validation project to create a WBS. When you've finished, answer the following questions:

1. There are two possible ways to create your WBS. Which is the best, and why?
2. What is the name of the highest-level component of the WBS?
3. What are the main project deliverables on the second level of the WBS? This is high level.
4. Now that you have the main project deliverables defined, analyze each one, and determine the components that make up each. These new components are the third level. Draw them.
5. Examine each level as you create it, and determine the components until you have work packages that are easily assigned to one person. How many levels did you create for this work breakdown structure? Display your work.
6. Uniquely number each component of the WBS. Draw your answer.

Exercise 4.2: Planning Communications with Your Stakeholders

The objectives for this exercise are as follows:

- Use the lines of communication to understand communication complexity.
- Understand how a plan can help you organize your communications.
- Create a detailed communications management plan.
- Create a communication plan matrix.

Background

As the project manager, one of your primary functions is to consistently and effectively communicate with stakeholders, individuals, and organizations with an interest in the project and its outcomes. People often take communication for granted. Once you understand the complexity of communication, you will understand why you must control it as best you can to

keep people focused on the right information about your project. To do so, you must seriously consider the methods you use for communicating.

The best way to communicate consistently and in an organized form is to write a communications management plan. First, you need to perform a communications requirements analysis to understand the communication needs of your stakeholders. One of the best ways is to gather information directly from your stakeholders when you interview them during your stakeholder analysis activities. You want to include the communications requirements in your communications management plan.

Once you complete the communications requirements analysis, you need to create a plan describing the types of communication you will distribute, to whom you will distribute them, and the methods by which you will distribute them. You need to describe the strategy and tactics you are using for communication in this plan. For instance, will you use formal or informal methods, and how much will you communicate to your team? You need to describe how you intend to keep the communication plan updated as the project goes though its various phases: As the people and activities on the project change, so do the communication needs. If your project is complex and you have many stakeholders, your strategy and tactics for communicating need to be far more formal and organized than if your project is small and you have few stakeholders. One of the best tools to include in a communications management plan is a communications matrix. In this matrix, you list all of your communication methods and the stakeholders who will receive the communication. List the stakeholders first, the information they need, and the communication methods you'll use. Describe the communication forms and when stakeholders will receive their information.

Lines of Communication

Communication is a very complex activity. The following formula illustrates the lines of communication (also called *communication channels*) that can exist based on the number of people involved on a project (*n* is the number of people communicating):

$$[n \times (n - 1)] \div 2$$

Therefore, if you have 5 people on your project, there are 10 channels of communication. Team members don't just communicate with the project manager, but they also communicate with each other. Since there are so many communication channels, the chances for miscommunication and distortion increase. If you have 20 people on the project, then there are 190 channels of communication—quite an increase for only 15 more people. These communication channels keep growing exponentially and can become difficult to manage if you don't have a plan and a consistent method for managing the communication.

Components of a Communications Management Plan

Once you have gathered your communications requirements, you are ready to create a thorough communications management plan. You might include several paragraphs describing your general strategy and tactics to frame your communication philosophy. This helps your team understand what they can expect from you and helps you formalize your thinking on how you will communicate issues as they arise on your project. Then you need to document the details. Determine how and where you will store your project information. You need to

decide the structure of the filing methods you will be using: electronic or hard copy. This plan will be published to team members so they know how to get information and where they should store the project information they create. Your plan for storage should also include procedures for documentation and communication management.

Your communications plan should include a communications matrix explaining who receives information, what the information is, who is responsible for distributing it, and when and how it will be distributed. Also, you need to provide your team members with a description of the format and content for each of the kinds of information that will be distributed. For instance, if you listed a status report as one of the information types, you would describe the data that will be captured in the status report. The communication matrix makes you plan all the document formats. You may also include a schedule for each type of information so it's clear when and how often it will be produced.

Your team will need procedures for getting project information between regularly scheduled communications, team members need to understand how to deal with escalations, and you need to provide the methods for updating the communications management plan itself as the project proceeds.

Creating a Communications Management Plan

Creating a communications plan is absolutely essential on a medium or large project, and by sticking to it, you'll prove to your organization that you are consistent and in control of the communication and, by implication, the project itself. The following are the steps you should take to create a communications management plan:

1. Decide on an overall strategy for your communication. You need to describe how you are going to handle communication and why. For instance, you might state in the communication plan that you are going to manage communication on a formal basis, with meetings and follow-up documents at all times. You might state that you will require a part-time communication manager on your project because of its complexity. You might include a need for help from the public relations staff because you will publish information to the media.
2. Describe how you will store and your team will retrieve information. For instance, you might state that you will keep all documents on the network drive and provide the directory name and file structure for all the project information. This policy will keep the directory from becoming unusable because people put documents wherever they think they should. You should also provide procedures that outline how the team or stakeholders should use this structure. Or, instead of a network drive, you might state that you will be using a website for all documentation and communication for your project.
3. Create a communications matrix. Make sure you are thorough by answering the basic questions: who, what, where, when, why, and how. You might consider including what the information is (such as status report), who will use the information (per stakeholder groups), when it will be published (such as weekly, as needed, or daily), who will be responsible for the communication (the project manager doesn't have to do everything—you can delegate!), and how the stakeholders will receive it (such as via email attachments, presentation, or meeting). You might even think about creating the matrix for each

phase of the project (concept, design, execution, close), because the stakeholders' information needs and frequency expectations can change.

4. Create a form and example content for each type of information listed in the matrix, or provide a reference if your organization already has a form you plan to use. For instance, create a status report form. Show all the fields of data you want to be included, such as dates covered, objectives and accomplishments for the status time frame, hot topics, issues, or action items. Make sure you describe what would go into each field.
5. Describe procedures your team and stakeholders will use when requesting and obtaining information outside of regular distribution times. For instance, by detailing that the media must contact the PR department first if they have a question, everyone on the project will know what to tell the media if they should get a call from a reporter. Also, it's a good idea to describe the escalation procedures you will use if you have an issue you need leadership's help to resolve.
6. Describe in the communications management plan how changes will be made and approved for the plan itself. If you have found you need another form of communication as you move into the execution stage, you will need to write a procedure to ensure that your team knows about the new communication form.

Scenario

You are working with an independent, nonprofit organization, Health America. Health America creates reports on the status and quality of hospital health care in the United States based on goals created by the president of the United States. Health America is implementing project management processes, and you are helping. This is a highly visible program in the government. It entails working with major hospitals and rating whether they are achieving specific goals as identified by the president's program. The research and reporting started about two years ago. You are helping the project manager, Bill Smith, create a communications management plan, including a communications matrix. Communications will be complex. Your team consists of researchers, analysts, and writers who produce the hospital quality reports for the Department of Health and Human Services (HHS). The media is interested in your project so they can report on the goals being met/not met. HHS is monitoring the project for the president and is paying for the program. The hospitals and the public need to understand how this program is helping them.

Testing Your Knowledge of Creating a Communications Plan

Complete the matrix shown in Table 4.1. When you fill in the Who column, describe the groups (or individuals, when appropriate) who need to receive the information. You might want to include another column to identify who is responsible for creating the communication (for instance, PR for external media reports), as well as any other columns you need to more fully describe how you will manage project communications.

Now, use the information from your communications plan matrix and your knowledge of Health America to answer the following questions:

1. Bill has 17 people on his immediate project team. How many lines of communication does he have with the people directly working on the team? Including the project team, he also has about 85 stakeholders he has determined he needs to communicate with or who might communicate with each other. What is the potential number of lines of communication on the entire project?
2. What should Bill's strategy be for communication on this project? Should it be formal or informal, mostly written or verbal? How much time should he spend on communication?
3. Will there be issues if Bill does not receive status updates from his team regularly? Why or why not?
4. Should Bill share the executive and client status reports with his team? Why or why not?
5. What is the purpose of the communications matrix?
6. Will meetings and written status be enough communication for the team members? Why or why not?
7. What kind of data would you include on the status report form? Why is it important to create a form?

TABLE 4.1 Communications Plan Matrix

What	Why (Purpose)	Who	When	How	Where (Storage)	Inputs

Exercise 4.3: Planning for Quality

The objectives for this exercise are as follows:

- Describe the four major inputs into quality planning.
- Describe the major output of the Quality Planning process.

Background

You have probably heard of the triple constraints of project management—time, cost, and quality. These three major areas require constant trade-offs to achieve a project's objectives. The planning process for quality can be just as tricky as schedule or cost planning. In this exercise, I will talk about the inputs to Quality Planning as well as the major output of Quality Planning—the quality management plan.

Quality Planning Inputs

The Quality Planning process has four inputs. I will cover three in depth. The fourth input is the project management plan, which I've already covered in workbook section 3.

Organizational process assets You can use organizational quality policies and quality guidelines from previous projects as inputs into your Quality Planning process. An organizational quality policy is a key input. A quality policy is a statement (usually provided by top management) regarding the company's beliefs about quality. Your company might have a set quality statement that you can use for your project. If none exists, you need to create one. This policy will be a guiding light for the people working on the project. If they are in doubt about a quality decision, they can look to the statement to answer their question. A quality policy might look something like this: "Quality will be emphasized in the early stages and throughout the project. It will be planned into the project as work begins, and it will be a part of the fiber of the entire project. We will design quality checkpoints and determine whether quality standards have been met."

Project scope statement This is the same scope statement that you created in Chapter 3. You use the scope statement to verify project deliverables. The scope statement might also spell out quality attributes as part of the objectives of the project.

Enterprise environmental factors The rules that apply to the creation of your product must also be considered in quality planning. Look for any standards and regulations that might apply. For example, if you are building a shed in your backyard, you would check standards, such as homeowner association rules, and regulations that require city and county permits and govern easements, construction, and property use.

Quality Planning Output

There is one major Quality Planning output: the quality management plan. The project manager and the project team create the quality management plan. It should detail all quality planning activities and who will perform them. The essence of this plan is how quality will be ensured and how the quality policy will be followed.

You have a new assignment. In it, you'll get a chance to begin planning the quality activities for a project.

Scenario

You have been placed at USRemotes, the largest distributor of remote control devices in the United States. USRemotes has launched a project to redesign the warehouse and shipping areas and processes—the WSAP project. The redesign is intended to reduce shipping time to customers. You've been assigned as the temporary project manager.

You have started putting the project schedule and costs together, and you know it is time to start working on planning the quality attributes of the project.

Testing Your Knowledge of Planning for Quality

Using the information provided for the WSAP project, answer the following questions about quality planning:

1. What are the four major inputs into the quality planning process?
2. Who should create a quality policy?
3. Why is the project management plan important to quality planning?
4. What is the major output of the Quality Planning process?
5. You have checked throughout USRemotes and cannot find a quality policy statement. Write a short quality policy statement for the WSAP project.

Exercise 4.4: Using Quality Planning Tools

The objectives for this exercise are as follows:

- Describe the three commonly used quality planning tools.
- Describe the appropriate time to use each quality planning tool.

Background

Many quality gurus such as Juran, Crosby, and Deming advocate that quality is planned in, not inspected in. To plan in quality, you must use a set of commonly known tools. You'll review these quality planning tools in this exercise. The three most commonly used tools are benchmarking, cost-benefit analysis, and the cost of quality.

The cost of quality is such an important concept that I will cover it in the next exercise.

Benchmarking According to the *PMBOK Guide*, when you benchmark, you look at the practices you have in place (or are planning) for your current project and compare them to practices used in other, better-performing projects. You are looking for ideas to improve your processes. You are also looking for a way to objectively measure that improvement in relation to the performance of others who are already successfully practicing the new processes. This is easiest to understand if you apply the concept to an everyday activity.

Say you are able to walk a mile in 20 minutes, but you want to walk faster. You might pick up some power-walking videos and study the techniques they recommend. Then you stop by your local high school, observe a racewalking practice, and time some of the walkers. Fifteen minutes is a typical time for the high-school racewalkers. You would then consider how you walk and how that compares with new techniques you learned. Based on that comparison, you decide which new techniques to try and set your mile-walking benchmark (15 minutes). The

next time you walk, you use the new techniques, time yourself, and compare your time to the benchmark. You can now objectively measure your improvement against the performance of the racewalking team.

Benchmarking is an effective tool for improving the way you work on projects and objectively measuring the improvement.

Cost-benefit analysis When you look at the trade-offs involved with an activity, you're probably talking about a cost-benefit analysis. Let's go back to the previous example of the mile walker. If the walker is trying to burn the most calories, she might want at walk faster or perhaps walk on hilly terrain. These options might burn more calories, but there is a price to be paid in the form of sore muscles or aching feet. She might need to analyze which approach will provide more calories burned and cause less wear and tear on her body. In quality planning, the same technique is used to determine which quality activities will provide more quality with less cost.

Scenario

You continue your work at USRemotes, the largest distributor of remote control devices in the United States. You have been assigned as the temporary project manager for a project to reduce its shipping time to customers by redesigning the warehouse and shipping areas and processes—the WSAP project.

You have started putting the project schedule and costs together, and now you know it is time to start planning the quality attributes of the project.

Testing Your Knowledge of Quality Planning Tools

Using the information provided for the WSAP project, answer the following questions about quality planning tools:

1. What is benchmarking?
2. What are the three most commonly used tools of quality planning?
3. What is cost-benefit analysis?
4. Since you are new to USRemotes, which quality planning tool best helps you understand what is currently being done?
5. Since USRemotes intends to improve its shipping time to customers through this project, what quality planning tool would be good to use for this project? Why?
6. You have just about completed your quality planning. The team has determined that there are three quality activities to consider for the project. You have time to perform only one of these activities. What quality planning tool would you use to determine which activity should be performed? Why?

Exercise 4.5: Calculating the Cost of Quality

The objectives for this exercise are as follows:

- Define the cost of quality.
- Describe the three types of costs associated with the cost of quality.
- Describe the elements that make up each type of cost.

Background

The cost of quality is a quality planning tool that deserves its own exercise. It is imperative that you understand the components of the cost of quality as well as how it is calculated. The definition of the cost of quality is the total amount of money required to ensure quality. It is composed of three types of costs—prevention costs, appraisal costs, and failure costs. It is sometimes easier to think of these costs as the costs of conformance and nonconformance, with prevention and appraisal as conformance costs and failure as nonconformance. When project managers speak of conformance, they are talking about conforming to the customer's requirements for the product. Let's spend some time on each of the different costs of quality:

Prevention Prevention costs cover all activities that must be done to keep errors out of the process of creating the product. These, of course, are preventative activities. These costs should include all quality planning activities, any training that must be done to keep errors out of the process, product validation activities, and process validation activities.

Appraisal Appraisal costs cover all activities that must be done to keep errors out of the customer's hands. These are the end-of-the-line activities that check the product one last time before it goes to the customer. These costs should include quality audits, evaluations, calibration, inspections, and field testing.

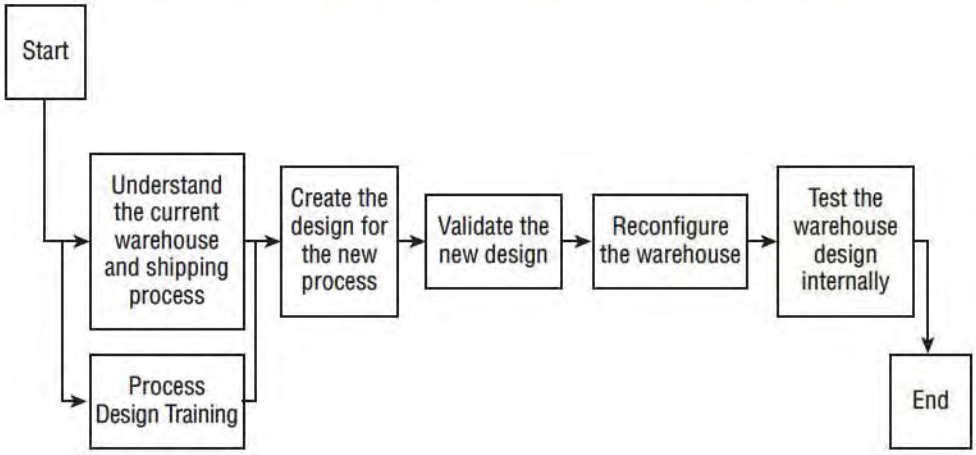
Failure Failure costs include all of the costs that are incurred because of the failure of the product both internal to the company and external to the company. Internal failures include the costs for rework, repairs to the product before the project is completed, scrap, and additional inventory that had to be purchased because of the failure.

External failures are those that happen after the product leaves the organization. These costs include warranties, complaint handling, product recalls, legal suits, and harm done to the company's reputation.

Computing the cost of quality is as simple as adding the work effort estimate for each activity that is preventative or appraisal in nature to the costs that are incurred because of any type of failure, whether internal or external. The first calculation for cost of quality can be determined during the planning phase. It can also be calculated again during the executing phase when failures occur. The cost of quality can also be calculated after the project is completed if and when product failures hit the customer's hands.

Scenario

You are still working with USRemotes as temporary project manager on its WSAP project. The project will redesign the warehouse and shipping areas to improve shipping time to customers. The team will also revise processes used by the shipping and warehouse functional groups with that same goal in mind. You have just completed the project planning phase. The network diagram you created provides a high-level overview of the project.



USRemotes is very interested in quality and plans to obtain a quality certification. Company executives have asked you to calculate the cost of quality for the WSAP project.

Testing Your Knowledge of Calculating the Cost of Quality

Consider what you've learned about the cost of quality and the information provided in the network diagram for the WSAP project as you answer the following questions:

1. What are the three types of costs associated with the cost of quality?
2. What type of cost is associated with nonconformance?
3. What is the definition for the cost of quality?
4. What tasks in the network diagram shown earlier should be included in the preventative cost of quality?
5. What tasks in the network diagram shown earlier should be included in the appraisal cost of quality?
6. While the warehouse was being reconfigured, you found out that the new shelving units did not fit the warehouse structure. These shelving units had to be scrapped and new ones purchased. The cost of the shelving units should be included in what cost of quality type?
7. It is a year after the WSAP project completed. You have heard through the grapevine that USRemotes has had to hire several customer service representatives to handle the complaints because of incorrectly shipped items. These costs are part of what cost of quality type?