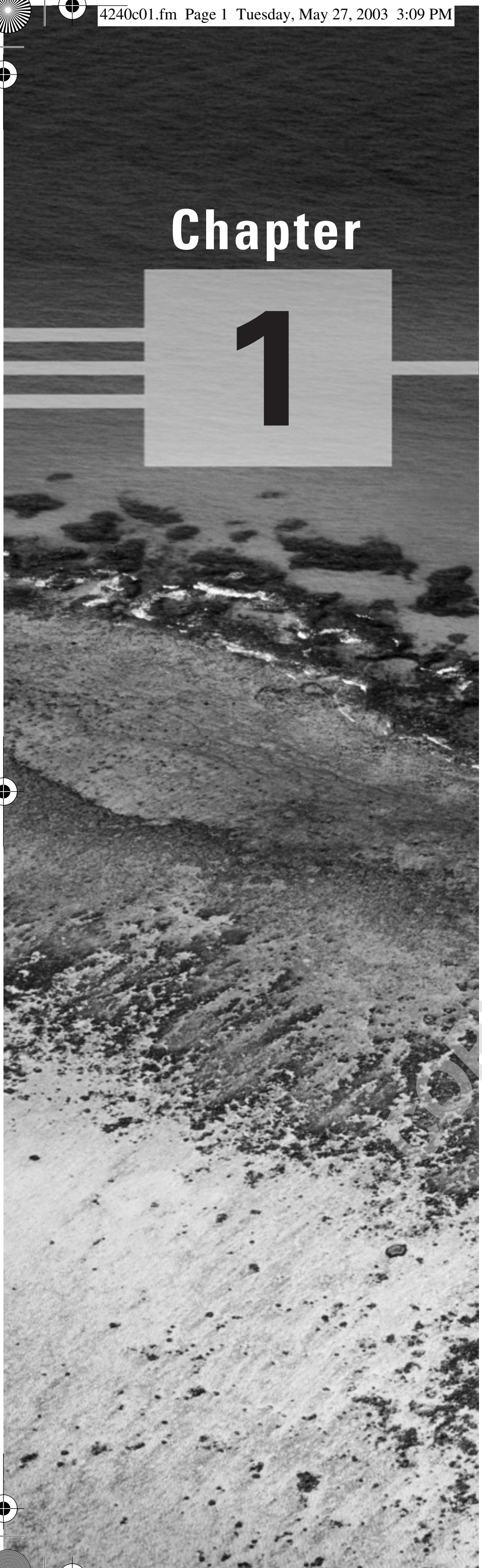

Chapter 1

Scope Management

THE EXERCISES PRESENTED IN THIS CHAPTER INCLUDE:

- ✓ **Exercise 1.1: Justifying a Project—Project Selection Matrix**
- ✓ **Exercise 1.2: Project Selection Methods—Financial Returns**
- ✓ **Exercise 1.3: Project Initiation and the Project Charter**
- ✓ **Exercise 1.4: Creating the Scope Statement**
- ✓ **Exercise 1.5: Creating a Scope Management Plan and Managing Scope Change**

Scope Management is one of the most important knowledge areas of the PMI's *Guide to Project Management Body of Knowledge (PMBOK)*, because it sets the bounds of the project. One of the most important jobs of the project manager is to help the team focus on staying within this scope.

Scope Management involves helping your organization decide on the criteria it wants to use to select projects, then setting up a process to select the projects an organization should pursue. Once the projects are selected, the organization needs to authorize the project and give the project manager the authority to manage the project via the project charter. After being assigned to the project, the project manager needs to ensure a scope statement is created so everyone understands the main objectives and deliverables, as well as constraints and assumptions of the project. Last, the project manager needs to ensure that scope is managed in a standard and consistent fashion. Although a project manager needs to manage many items for scope, the exercises described in this chapter ensure the most fundamental documents or processes of Scope Management are completed. Scope Management is covered in the Initiation, Planning, and Control objectives of the PMP exam.

Exercise 1.1: Justifying a Project—Project Selection Matrix

The objectives for Exercise 1.1 are:

- Describe various project selection criteria.
- Select and justify a project based on a project selection matrix exercise.

Background

Organizations need to be selective in projects they undertake. Otherwise, they would work on all projects proposed in the organization. The projects need to align with the organization's strategy, and provide some kind of return on investment, whether it is financial or some other criteria the organization finds important. A project selection matrix (which could be based on a weighted scoring model), based on well-defined project selection criteria, helps an organization select projects. A project selection committee may use this matrix. First, committee members set up the criteria for selecting projects, and then, for each criterion, they decide what methods to use to measure the project's potential. (For instance, see Exercise 1.2 of this workbook for information on financial return methods.) The matrix allows organizations to make objective decisions (at least, as objective as possible) in deciding which projects to undertake. It also helps the organization prioritize the selected projects—allowing the organization to cut projects if budgets or resources become tight. An organization may have several criteria for selecting projects, and may use several project selection methods. Sometimes, even though a project may look financially risky, it may be worth undertaking, because it will provide a public perception boost the organization needs to regain or improve its market penetration. So, even after using the project selection matrix, a selection committee may choose to proceed with a project based on some other criteria that may not have been part of the initial selection process. In this exercise, you are going to practice using a project selection matrix and learn the criteria for justifying a project. Then, using a scenario involving your company, Terrific Project Management Partners (TPMP), you will put those practices to use.

NOTE

Recommended Reading: Chapter 3, pp. 86–97, *PMP Project Management Professional Study Guide*, Kim Heldman, PMP (Sybex, 2002).

Using a Project Selection Matrix

When creating a project selection matrix, you must first decide on the project selection criteria and weight the criteria according to the organization's strategic goals and other objectives. Some possible criteria may be:

- Financial return
- Effect on employees/alignment with corporate culture
- Technical advancement or innovation
- Market value/share
- Public perception
- Alignment with/advancement of corporate strategy

For each criterion in your matrix, complete each project's objective or subjective measurements. Table 1.1 provides some possible benefit measurements for sample criteria.

TABLE 1.1 Project Selection Criteria

Criteria	Possible Benefit Measurements
Financial return	• Net present value (NPV) • Cost/benefit analysis • Internal rate of return (IRR)
Cost avoidance	Cost/benefit analysis (calculate savings and all costs)
Technical advancement or innovation	• Will it apply only to the project, the entire organization, or will what is developed during the project be marketable outside the organization? • Will it appear as innovative to others in industry, thus creating prestige for the organization?

TABLE 1.1 Project Selection Criteria *(continued)*

Criteria	Possible Benefit Measurements
Market value/share	Increase value/share according to set formula, research, or surveys
Public perception	• Measure perceived increase/decrease in perception based on focus groups, surveys, or interviews. Estimate the awareness/perception that will be created. • Calculate the number of people affected/made aware
Alignment with organization expertise	• Does the project team have the expertise to do the project? Can the organization acquire the expertise and does it want to? • Will the project efforts help develop some expertise or skill it wants developed?
Needed infrastructure improvement	• Improved productivity—show cost savings if possible • Describe old system/processes that might collapse or slow down and include impact • Compare with other infrastructure projects

Project Justification Criteria

When justifying a project, follow these steps:

1. Select five to seven main criteria to justify your organization's projects. If you select more, this exercise will become difficult to manage. Assign a weighting factor to each criterion according to what is most important to the organization.
2. For each criterion, select the benefit measurement you will use.
3. Create the list of all proposed projects. Note that most should have a written business case to provide more information for the project selection committee.
4. Put the projects in a matrix and rate each project according to the method selected. Then, multiply the weighting factor to each rating received.
5. Eliminate any projects based on any minimum standards or thresholds you have established prior to the ranking exercise (for instance, if the project would lose money and all other rankings are below a 5 average, it automatically is eliminated).
6. Rank the remaining projects.
7. Select the projects you want to proceed with from this ranking.
8. Make sure you document justifications for each project selected based on this process. You can use the justification in your project charter, scope statement, business case, or any other document supporting the project.

Scenario

Your consulting company, Terrific Project Management Partners (TPMP), has been asked to help an established investment company, Best Investments Company (BIC), to create a project justification process for them. The company tends to take on all projects that are proposed, and it has become increasingly difficult to manage the company's project portfolio. You will help them establish a semiannual review process using a project selection matrix based on the company's major project criteria.

BIC has a choice between the following three projects:

- Build investment kiosks and put them in major malls across the United States, known as the kiosk project.
- Create a program to recruit community financial advisors who provide services to investors within a particular territory based on per capita income of various communities, known as the financial advisor project.
- Build franchises that work like fast food restaurants in strip malls , known as the franchise project.

BIC could choose all or one of these projects to increase its presence in the community. After much discussion with the project selection committee, TPMP got agreement that the following are the most important objectives for the company. They also created a weighting factor for each (presented in Table 1.2). These weighting factors will be multiplied by the benefit measurement ratings each of the projects received for the criteria. BIC project managers will meet to determine their rating or score system for each of the criteria.

This process will help rank projects so that those with good rating scores for higher weighted projects will be selected prior to those that might have high ratings for less important criteria.

TABLE 1.2 Best Investments Company Criteria and Weighting

Criteria	Weight Factor
Increase market share as the investment company of choice	5
Good financial return	4
Provide possible innovation in investment tools and techniques	3
Support the corporate culture of employee supporting employee	2
Increase public awareness	1

After applying project measurement ratings for each of the criteria supplied in Table 1.2, the projects were given scores (with 10 being highest possible mark). The kiosk project ratings are represented in Table 1.3.

TABLE 1.3 Kiosk Project Criteria Ratings

Criteria	Rating
Increase market share	5
Good financial return	6
Innovation	9
Support culture	1
Increase public awareness	8

For the financial advisor project, BIC came up with the following ratings represented in Table 1.4.

TABLE 1.4 Financial Advisor Criteria Ratings

Criteria	Rating
Increase market share	7
Good financial return	3
Innovation	5
Support culture	5
Increase public awareness	5

Finally, for the franchise project, BIC created the ratings shown in Table 1.5.

TABLE 1.5 Franchise Criteria Ratings

Criteria	Rating
Increase market share	7
Good financial return	7
Innovation	4
Support culture	3
Increase public awareness	6

Justifying a Project—Project Selection Matrix

Complete the following matrix using the above information. Remember that the actual score for a criterion is the rating times the weighting factor.

1. Fill in the following Best Investment Company project selection matrix based on the information above.

Criteria	Kiosk	Financial Advisor	Franchise
Increase market share			
Good financial return			
Innovation			
Support culture			
Increase public awareness			
Total Score			
Project Rank			

2. If you could choose only one project after this process, which one would it be and why?

3. Does the project ranking determine which project will be selected over the other?

4. Is this a good method for selecting projects? Why or why not?

5. What other criteria might a company use for deciding on projects?

6. What are some potential problems using this method of selecting projects?

Exercise 1.2: Project Selection Methods—Financial Returns

The objectives for Exercise 1.2 are:

- Describe the importance of having a measurement methodology for selecting projects for a particular criteria.
- Describe various financial return methods.
- Use financial return methods to select a project.

Background

Project selection methods help an organization objectively decide what proposed projects to pursue. Project selection methods also help the organization prioritize projects based on the outcome of applying the selected method to the approved projects. The method used is based on the selection criteria an organization uses (as explored in the previous exercise). The more objective methods an organization uses, the better it can justify the selection and sustain the project over time. If your organization does not use selection criteria and project selection methods, projects might be selected according to the person who lobbies the loudest for their project or the organization may overload itself with projects.

In Exercise 1.2, you'll explore methods for project selection, then you'll help Terrific Project Management Partners (TPMP) provide project advice for one of its clients.

NOTE Recommended Reading: Chapter 3, pp. 88–97, *PMP Project Management Professional Study Guide*

Before you begin the project selection process, you will have to make a few decisions regarding your approach.

First, decide on the project selection criteria that you want to measure. In Exercise 1.1, we listed several of those criteria. Next, decide on a consistent and standardized approach for measuring benefits for the criteria. For instance, for financial return you could use one or more of the following:

- Payback period
- Net present value (NPV)
- Internal rate of return (IRR)
- Other forms of cost/benefit analysis

Finally, apply the same method for each project using objective measurements.

NOTE Subjective measurements, based on expert judgment or some kind of methodology created by the organization or team, work as well as using objective measurements. For instance, how do you measure an increase in public perception? Using previous similar projects as a basis, you could use a focus survey or market research to measure success. These methods offer a way to measure criteria in a consistent and standard approach and have an outcome based on analysis to help you better justify your decision.

Scenario

Your consulting company, Terrific Project Management Partners (TPMP), has been asked to help an established investments company, Best Investments Company (BIC), use project selection methods. Best Investments Company tends to take on any project proposal so it has become increasingly difficult to manage the company's project portfolio. Just as BIC helps its customers achieve the best return for their money, BIC would like to ensure that its three projects have the best financial return; BIC decided to use financial return as their major project selection method.

In order to select the best financial return method, you will take the executives at BIC through several exercises to help them decide which one they should use. They have decided that they want their project managers to be able to calculate these financial return methodologies; they do not want to make the work too complex, but they want the most accurate method possible.

You will take them through the following financial return methods:

Payback period Payback period is the amount of time it takes a company to recoup its initial investment in the cost of producing a product or service. It is fairly simple to use, but is not as accurate as other methods because it does not consider how the value of money is affected by interest over time. The decision is based on when the payback comes, not on how much the organization will make after that payback point.

Discounted cash flow/net present value (NPV) Net present value (NPV) brings the value of future monies received into today's dollars minus the initial investment. It is a fairly accurate method because it takes into account the time value of money, but it uses more complicated formulas. You would choose projects with the highest NPV.

Internal rate of return (IRR) IRR is the discount rate when the present value of the cash inflows equals the original investment. This is a complex but accurate calculation. You should choose projects with the highest IRR value.

When completing Exercise 1.2, you will use the following projects and financial projections to help the company see how these methods work.

Build an investment kiosk. Initial cost is $5 million to install in targeted locations, and return is expected to be $750,000 the first year, $300,000 per quarter over the next two years, and $750,000 semiannually, thereafter.

Create a program to recruit community financial advisors. Initial cost is $8 million to recruit and train the advisors, and return is expected to be $1.5 million the first year, $400,000 per quarter over the next three years, and $750,000 semiannually thereafter.

Build franchises that work like fast food restaurants in strip malls. Initial cost is $11 million to build or convert existing buildings in targeted locations and to hire employees, and return is expected to be $1 million the first six months, $2.5 million the second six months, $500,000 per quarter the second year, $600,000 per quarter the third year, $3 million annually thereafter.

Project Selection Methods—Financial Returns

Determine financial return for the three BIC projects. You might want to create tables for each project.

1. Based on the three projects, which one has the best payback? Rank them.

   ____
   ____
   ____
   ____

2. Will the project manager be able to calculate this information? Why?

   ____
   ____
   ____
   ____

3. For Best Investments Company, what are some of the advantages/disadvantages of this method?

   ____
   ____
   ____
   ____

Based on the kiosk, financial advisor, and franchise projects, use the net present value method to answer Questions 4–6. You may use the same investment and expected financial projection information described in the project setup, but in this case, the time value of money (interest rate) is 5 percent and you will calculate NPV over five years for each project.

TIP You will need to lay out the actual inflows for each year and apply the present value formula to each year, then subtract the initial investment. Also, round to the nearest dollar. To make this easier, check out the following interest rate table.

Year 1: $(1 + .05)^1 = 1.0500$

Year 2: $(1 + .05)^2 = 1.1025$

Year 3: $(1 + .05)^3 = 1.1576$

Year 4: $(1 + .05)^4 = 1.2155$

Year 5: $(1 + .05)^5 = 1.2763$

1. Based on these three projects, which one will provide the best NPV? Rank them.

2. Will the project manager be able to calculate this information?

3. For Best Investment Company, what are some of the advantages/disadvantages of this method?

Finally, for Questions 7–10, you will use IRR without actually calculating IRR. In the case of the three projects, the following shows the IRR value for each project.

- Build an investment kiosk. IRR = 5.5 percent
- Create a program to recruit community financial advisors. IRR = 3 percent
- Build franchises in strip malls that work like a fast food restaurant. IRR = 5 percent

1. Based on the kiosk, financial advisor, and franchise projects, which one will provide the best IRR? Rank them.

2. Will the project manager be able to calculate this information?

3. For BIC, what are some of the advantages/disadvantages of this method?

4. Which financial return method would you recommend for BIC and why?

Exercise 1.3: Project Initiation and the Project Charter

The objectives for Exercise 1.3 are:

- Describe the need for a project charter.
- Describe the essential elements of a project charter.
- Create parts of a project charter.

Background

A project charter is the official written acknowledgment and recognition that a project exists. It's issued by senior management external to the project and gives the project manager authority to assign organizational resources to the work of the project. When writing a charter, you will capture and document information such as:

- A description of the product and an overview of the project
- Project goals and objectives
- Project deliverables
- The business case or the business need for the project
- Resource and cost estimates
- Feasibility study (optional and not a part of this exercise).

In this exercise, you will learn the steps required for writing a project charter and lead BIC through the process as well.

NOTE Recommended Reading: Chapter 2, pp. 57–61 and Chapter 3, pp. 100–103, *PMP Project Management Professional Study Guide.*

A project charter describes the basic elements of the project and authorizes the project to continue. To write a project charter, follow these steps:

1. Interview the sponsor of the project, any product managers, and any other organizational leaders involved in the project to ensure you understand the product and the purpose of the project. For each succeeding interview, as you listen to the information and take notes, confirm that all of the interviewees concur with the major points you progressively discover.
2. Ask your sponsor and other stakeholders what the main goals and objectives of the project are. Ask questions such as: When you get to the end of this project, what is the product going to look like and what will it do? Have them attempt to define what success looks like for the project.
3. Ask your sponsor and other stakeholders what tangible deliverables will be part of the project. Give them some examples, based on the typical life cycle of your product or service.
4. Collect the business case for your project and attach it to the plan. If it has not been completed, then complete it yourself. Note that you may want to share the major points of the business case with your sponsor and other interviewees, and confirm that all the product justifications have been included, and that your stakeholders agree with the business case.
5. Start an estimate of resource needs and costs. Use previous projects as comparisons; ask your stakeholders for estimates, and based on size and complexity and the kind of industry you are in, start accumulating this information.
6. Write the project charter with all the information you have gathered.
7. Include a description of the authority the project manager will need (can you hire/fire, control budget, reward/punish performance?).
8. Ensure all elements described in the introduction are documented.

9. Ask your sponsor or a senior leader to review and change the charter as needed, and have them sign it and distribute it to leadership and management affected by the project.
10. Have a meeting to ensure concurrence with the charter for all executives and identified team members.

Scenario

Your company, Terrific Project Management Partners (TPMP), has been requested to continue helping the Best Investments Company (BIC) with their project initiation processes. BIC has selected a project and wants to understand how a project charter can help further define and authorize the project. The company has decided to build electronic kiosks in major malls throughout the United States. Jim Thoroughgood has been assigned as project manager, and you will be mentoring him on the project. You will help Jim write a project charter.

BIC expects the kiosk project to deliver most of the standard items for a new investment program, but this one has a twist: BIC is an investment company, not a construction company, and the project involves the construction of a kiosk. The project also involves electronic innovation, specifically, easy computerized menus for mall users. So, some of the things you might need are a software application with an easy user interface, a constructed kiosk, the investment program you will try to sell, advertisements for this new investment program, and other items that will be part of a successful new product. Martha Frederick, your main sponsor, has asked that the first kiosk be in place within nine months and the budget for initial implementation of 25 kiosks should cost no more than $5 million. She says the company doesn't expect anything glitzy—just something efficient and attractive to the average investor.

Project Initiation and the Project Charter

1. Describe the product of the project. Do this in your own words, and don't hesitate to add some of your own thoughts to this description.

 ____

 ____

 ____

 ____

2. What are the main goals and objectives of this project? Again, don't hesitate to add some things you know need to be included that may not be included in the exercise setup description.

 ____

 ____

 ____

 ____

3. What are the main, high-level project deliverables?

4. List the responsibility and authority Jim Thoroughgood would require to succeed on this project.

5. Is it a good idea to have the project manager's responsibility and authority written in the project charter? Why?

6. What are the resource and cost estimates?

7. Who signs the charter, and to whom is the charter given?

Exercise 1.4: Creating the Scope Statement

The objectives for Exercise 1.4 are:

- Describe the need for a scope statement.
- Describe the parts essential to a scope statement.
- Create the parts of a scope statement.

Background

The project scope statement is one of the most important items you can create for your project. Without it, you have a project with no bounds. Without it, what the project will accomplish can be anything you or your stakeholders decide along the way. A scope statement acts as your common understanding of the project requirements and deliverables. It is also the baseline of the scope, and if things change, you will follow change procedures to document and plan the changes into your project. If you use a vendor, the scope statement can be used to develop a statement of work (SOW) to describe the work the vendor will perform.

In this exercise, you will learn the elements of a scope statement and the steps involved with creating the scope statement by leading BIC through the scope statement process.

Scope Statement Elements

You will document the following elements for your scope statement:

- Project justification—describe the business need the project is to address.
- Project product—describe the product or service briefly.
- Requirements or specifications—ensure requirements of the product or service are documented. This may be a separate deliverable.
- Project deliverables—list summary-level subproducts for full delivery of the project. This may include a high-level work breakdown structure to show the scope of the project.
- Project objectives—list quantifiable criteria for success and include at least cost, schedule, and quality measures.
- Assumptions—list any assumptions you are making for the project.
- Cost and time estimates.
- Constraints—list any constraints you have for the project.

NOTE

Recommended Reading. Chapter 4, pp. 120–126, and Chapter 2, pp. 63–66, *PMP Project Management Professional Study Guide.*

The Scope Statement Process

When creating a scope statement, follow these steps:

1. Review the project charter for any items you can reuse for further detail in the scope statement.
2. Work with your project team or other stakeholders to write a brief general statement about the purpose of your project. Try to include a general description of what is in the project, as well as what is not in the project.
3. Include a project justification. This may have been completed in a business case, feasibility study, the project charter, or the project selection work that was completed prior to the project's being approved.

4. Rewrite or use a product or service description. This is not about the project itself, but the result of the project.
5. Create a list of major deliverables and create a high-level work breakdown structure to help show the scope of the work. This is a good time to brainstorm with your project team. You might even think of all the deliverables you can on the way to creating your work breakdown structure, and then categorize them into major categories. You want to capture only around seven of the major deliverables (maybe more if the project is complex). Make sure each of these deliverables are measurable and have success criteria tied to them.
6. List the objective(s) or goals. This is where you describe the goals that help you measure project success. You might think of what must be done for the project to be complete (critical success factors). This needs to be a quantifiable statement, such as "increase shareholder satisfaction by 10 percent." This could be easily measured with pre- and post-implementation surveys. The surveys, of course, would need to be a deliverable of the project.
7. List assumptions. These are things that you and your project team expect to hold true throughout the project. Sometimes these are statements that seem they should not have to be said: They are obvious. But by documenting them, you can test them as assumptions and ensure stakeholders agree with them. Often these assumptions, if they do not hold true, become risks.
8. List constraints. These are bounds under which your team will work throughout the project. They restrain or dictate the actions of the project team. For instance, if the team needs to follow some particularly strict safety procedure, it will restrict the team from getting the work done as fast it could otherwise.
9. You may include requirements in the scope statement or produce them in another document (then refer to them in the scope statement). These requirements are the basis for understanding the amount of work that needs to be done, and for creating a statement of work for a vendor, if you will need to contract some of the work.
10. Include any of the major roles and responsibilities needed for the project.
11. Write the scope statement document, and deliver it to your stakeholders for approval. Have a meeting to review the scope with the team and the stakeholders.

Scenario

You're helping the Best Investments Company (BIC) to continue developing consistent practices in project management in the initiation and planning stages. In particular, a project being managed by Betsy Smith has already been started; since you have been on hand to help advise them of good project management principles, BIC now realizes that it needs a documented scope statement. Betsy is working on a project to increase public awareness and the use of an Internet investment program that has existed for six months, but which is not meeting expected market penetration. Her team has been researching the project for a month, but now the team needs a plan for what to do next. The Internet investment project was expected to increase the overall investment penetration by 10 percent. Right now, no one is sure how much it has increased investment penetration, since overall investment activity by the public has gone down 15 percent in the last year. The team has advertised this service on TV and with Internet pop-up ads. This project has a budget of

$50,000 to develop the plan, and BIC wants the plan within three months. Betsy has already used up about $4,000 in research efforts. Betsy has a team of researchers, part-time software application developers, and the original Internet investment program project manager to call on for help. She is very excited because she has realized the team did not do any advertising for this project in some of the major magazines, such as *Fortune*, and the TV ads were at the wrong times for the target audience. She thinks with this knowledge, she can help the Internet service increase penetration immediately if the team focuses on those areas.

Creating the Scope Statement

1. Write a brief purpose statement for this project. Include a business justification statement. What is the product of this project?

2. What are some of the major deliverables of the project? Is each deliverable you identify a critical success factor? Why or why not?

3. Create some goal/objective statements and make sure they are measurable. State what you will put in place to measure them.

4. Describe some of the assumptions you have for this project.

5. Describe some constraints.

6. Will you need a statement of work? Why or why not?

Exercise 1.5: Creating a Scope Management Plan and Managing Scope Change

The objectives for Exercise 1.5 are:

- Describe the need for a scope management plan.
- Describe the parts of a scope management plan.
- Be able to create a scope management plan.
- Learn how to manage scope change.

Background

Is the scope of your project well defined? If the scope changes for your project, what will you do? Do your stakeholders know what to do if they need to suggest a change to the scope of your project? When should you change the scope of your project versus not changing it? All of these questions (and many more) will be answered if you create a scope management plan. As with all PMI's knowledge areas, PMI suggests using documentation to manage that knowledge area. If criteria don't get written down early in the planning process, you will tend to make them up along the way. Maintaining and documenting changes to the scope prevents you from becoming disorganized and helps you manage the project consistently. It also means you and your team can more easily manage scope change and will not allow change that shouldn't occur.

For the scope management plan, you need to identify the stability of the scope at the time you document the plan, how often the scope could change, and the impact to your project if the scope does change. You also need to document how you will manage change. For instance, will you have a form that must be completed, or can people just send e-mail? Whose approval will you need and when? Are there some scope changes the project can absorb without too much impact?

In Exercise 1.5, you will learn the elements that make up a scope statement, and the methods for creating a scope management plan. Finally, you will continue to help the Best Investment Company (BIC) in its project management endeavors.

Scope Management Plan Elements

You will document the following elements for your scope management plan:

- What is the stability of the project scope? Is it early in the plan and, thus, likely to change as you build more information about your project? Or is it simple and well defined, or later in the project planning to indicate a more stable scope?
- How often do you estimate the scope might change, and why?
- If the scope changes, what will the impact be to your project? Do some scope changes have more impact than others? Why?

For managing scope change you will want to ensure you answer the following questions:

- What kind of information about the change needs to be captured?
- Are there specific processes you will use? How will you log, track, and ensure change is incorporated into the project? How will you manage scope changes not accepted for this phase of the project?
- Who needs to approve change?
- How often will scope changes be reviewed?

NOTE

Recommended Reading, Chapter 4, pp. 127–129, *PMP Project Management Professional Study Guide.*

Creating a Scope Management Plan

When creating a scope management plan, follow these steps:

Review your scope statement and make some informed judgments about its stability. Has everyone approved your statement? Will you have new stakeholders join the project over time? Does it still need some clarity? Have you been able to thoroughly document its assumptions and constraints? Have you been able to easily identify success criteria and create objective measurements for its goal statements? Is the project simple and of short duration? If the answer is "no" to any of these, you may need to say the scope is not stable and you will see more changes. Give the scope stability a confidence factor rating, and list the steps you will take to progressively stabilize the scope.

Are the deliverables well defined? Is the project small or short in duration? Is it later in the project phase? Is it just like a similar project done before or a cookie cutter type of project? If the answer is "yes" to any of these, then you may be able to rate the scope stability as high.

Provide in the plan the probability of scope changes and their frequency. This might be based on the phase you are in or the stability confidence factor you created. You could use this information to estimate how much time you will need for project administration of scope changes. You might create a table with various dates on which you will perform a scope review so you can have the team review the scope and its stability and then reflect changing stability after these reviews.

Describe how scope changes will impact the project. If you are under a very tight schedule, you might describe how any scope addition will change the end date. Or if quality is one of the important driving factors, that additions to the scope will have to also include additional quality assurance.

Document the scope change process. You will want to integrate the scope change process into your overall change control procedures that will be described in a later exercise. You will need to document the following data and processes whether it is an increase or decrease in the scope of the project:

a. General information about change, such as date, brief description, and who is requesting the change.

b. Business, technical, or other need for the change.

c. Describe the resulting analysis of the change (a subject matter expert needs to document impact/analysis). The following items might be a part of that analysis.

- Impact on scope, resources, cost, quality, schedule, a deliverable, goal, or any other item in the project that will change.
- Are any new risks introduced, or old risks impacted? What are some of the issues or impacts to existing requirements of the service or product that could occur due to the scope change?
- Will the change affect other dependencies, such as another project or business processes?

d. What are the levels of review and approval for the change and how is the change (or reason the change was not accepted) communicated to everyone (whether affected or not)? You might set up a matrix for levels of approval in the scope change plan or in the overall change control plan. The thresholds for approval will vary greatly depending on the complexity of the project. For instance, a five-month project may be able to tolerate a week's slippage and thus may not require a high-level approval. But a one week slippage for a two-month project is relatively significant.

e. How will the change be integrated into the scope and now managed and tracked as part of the project plan?

Communicate the scope management plan and the scope change process to your project team. Have a meeting to describe the scope management plan, and hold a training session to make sure everyone knows how to follow your processes to change scope.

Scenario

You're helping the BIC to continue in developing consistent practices in project management planning stages. In particular, a project being managed by Betsy Smith has already been started, but it doesn't have a scope management plan. The project is to create a plan that will increase public awareness and use of an Internet investment program that has existed for six months, but which is not meeting expected market penetration. She has created a scope statement with your help. The project budget is $50,000, is expected to take three months, and includes deliverables of in-house research and a focus survey. The end result is a plan that the sponsor, director of marketing Harriet Freeman, feels must be backed up by excellent marketing research, and which is easily implementable. During the introduction of the scope statement, two key stakeholders were missing, and Betsy has tried to get their approval, but has not been able to do so yet. The project has already started, and most of the research has been completed. Betsy is finding evidence that some major marketing steps were not originally done in the project; plus the market has changed due to the downturn in the economy, so some extra marketing steps need to be taken, including more Internet and TV advertising.

Creating a Scope Management Plan and Managing Scope Change

1. Rate the stability of the scope. Base this on your own confidence factor and describe what you think makes the scope stable and/or unstable.

2. What are some reasons the scope might change? How often do you think the scope might change? Why?

3. Fred Arlington, the project manager from the original project, thinks that the project needs to include hiring an independent auditor to review the market research findings because he does not think the research team is coming to the right conclusions. Describe potential impacts to schedule, quality, the people, or any other important elements of the project this change might cause.

4. What must Fred do to request this change? What data do you need to capture for this scope change request?

5. Who do you think needs to approve the change, and when should the change reviews occur?

6. Why is a scope management plan important?

Answers to Exercise Questions

Answers to Exercise 1.1

Your answers should be similar to the following:

1. The following shows you how the Best Investments Company project selection matrix would be completed. Note that the answers you have do not need to match the answers provided. You may think of other information or justifications besides those given.

Criteria	**Kiosk**	**Financial Advisor**	**Franchise**
Increase market share	5 x 5 = 25	7 x 5 = 35	7 x 5 = 35
Good financial return	6 x 4 = 24	3 x 4 = 12	7 x 4 = 28
Innovation	9 x 3 = 27	5 x 3 = 15	4 x 3 = 12
Support culture	1 x 2 = 2	5 x 2 = 10	3 x 2 = 6
Increase public awareness	8 x 1 = 8	5 x 1 = 5	6 x 1 = 6
Total Score	86	77	87
Project Rank	**2**	**3**	**1**

2. The franchise project provides the greater increase in the market share and financial return, although the kiosk project is so close in overall ranking and may be considered. By looking at the details of what was rated so high, you can see that innovation is what made the kiosk project achieve a higher rating, which is a lower weighted criteria.
3. The project ranking certainly provides a good way of ranking projects and is clearly demonstrated in this exercise. However, in this case, if the company found that the innovation

of the kiosk project was important to the company's strategic advancement, it might choose the kiosk project over the franchise project. Or perhaps it would decide to undertake both projects, because the innovation of the kiosk project is so compelling. At any rate, this process provides a consistent and objective method of selection, but it may not be the only factor in choosing one project over the other.

4. Yes, the project ranking is an excellent method. There may be other kinds of selection methods, but this provides a consistent approach to ranking projects. There may be some projects that could have the same ratings, and there would need to be a method for breaking ties, as well.

5. Some other criteria a company might use are: Cost avoidance (Cost/benefit analysis—calculate savings and all costs)

   Alignment with company expertise. (Does the project team have the expertise to do the project? Can the company acquire the expertise and does it want to? Will the project efforts help develop some expertise it wants developed?)

   Needed infrastructure improvement. (Improved productivity—show cost savings if possible. Describe old system/processes that might collapse or slow down and include impact. Compare with other infrastructure projects.)

6. Some possible problems include:

   It is possible that each project would not be rated consistently. The project selection method and the way it is applied needs to be consistent. Also, there may be times when a project may rate and rank low, but there is some intrinsic value that might be ignored. The project selection committee must use good judgment and instinct to think about projects. It is also possible that the selection process can be overridden by leaders or politics in the company. This may be okay, or it may undermine the selection process.

Answers to Exercise 1.2

The best way to answer this exercise is by setting up a year-by-year expected cash flow matrix. It would look something like the following set of tables. You may think of other information or justification besides those given.

The first table shows Kiosk cash inflows with an initial investment of $5,000,000.

Year	Cash Inflow in Dollars
1	750,000
2	1,200,000
3	1,200,000
4	2,000,000
5	1,500,000
6	1,500,000

The next table shows financial advisor cash inflows with an initial investment of $8,000,000.

Year	Cash Inflow in Dollars
1	1,500,000
2	1,600,000
3	1,600,000
4	1,600,000
5	1,500,000
6	1,500,000

This last table shows franchise cash inflows with an initial investment of $11,000,000.

Year	Cash Inflow in Dollars
1	3,500,000
2	2,000,000
3	2,400,000
4	3,000,000
5	3,000,000
6	3,000,000

1. The Kiosk project has the best payback, which would be early in the fourth year. The original investment was $5 million, and by adding each year's totals incrementally, the payback of $5,150,000 would occur in the fourth year. This would rank number 1.

   The franchise project has the second best payback, which would be early in the fifth year. The original investment was $11 million, and by adding each year's totals incrementally, the payback of $13,900,000 would occur in the fifth year (it would be paid back early in that year). This would rank number 2.

   The financial advisor project has the third best payback, which would be in the sixth year. The original investment was $8 million, and by adding each year's totals incrementally, the payback of $9,300,000 would occur in the sixth year. This would rank number 3.

2. Yes, the project manager could do this calculation. It is one of the simplest financial return calculations. After the cash inflows are projected, the project manager can make this calculation with simple addition/subtraction.

3. Some advantages of the payback period method are that it is simple to calculate and easy to understand. A major disadvantage is that it does not take into account the time value of money (interest) and thus, it is not as accurate as the other methods.

4. The best NPV is the franchise project, and the second is the kiosk project. Since the financial advisor project has a negative NPV, it should not be considered in a ranking. The following tables describe how the NPV was calculated for each.

   The first table shows NPV for kiosk inflow based on the initial investment of $5,000,000.

Year	Cash Inflow in Dollars	Calculation	Totals
1	750,000	750,000 ÷ 1.0500 =	714,286
2	1,200,000	1,200,000 ÷ 1.1025 =	1,088,435
3	1,200,000	1,200,000 ÷ 1.1576 =	1,036,628
4	2,000,000	2,000,000 ÷ 1.2155 =	1,645,413
5	1,500,000	1,500,000 ÷ 1.2763 =	1,175,272
Total			5,660,034
Less Investment			(5,000,000)
NPV			660,034

   The next table shows NPV for the recruitment project based on the initial investment of $8,000,000.

Year	Cash Inflow in Dollars	Calculation	Totals
1	1,500,000	1,500,000 ÷ 1.0500 =	1,428,571
2	1,600,000	1,600,000 ÷ 1.1025 =	1,451,247
3	1,600,000	1,600,000 ÷ 1.1576 =	1,382,170
4	1,600,000	1,600,000 ÷ 1.2155 =	1,316,331
5	1,500,000	1,500,000 ÷ 1.2763 =	1,175,272
Total			6,753,591
Less Investment			(8,000,000)
NPV			(1,246,409)

   The last table shows the NPV for the franchise project based on the initial $11,000,000 investment.

Year	Cash Inflow in Dollars	Calculation	Totals
1	3,500,000	3,500,000 ÷ 1.0500 =	3,333,333
2	2,000,000	2,000,000 ÷ 1.1025 =	1,814,059

Year	Cash Inflow in Dollars	Calculation	Totals
3	2,400,000	2,400,000 ÷ 1.1576 =	2,073,255
4	3,000,000	3,000,000 ÷ 1.2155 =	2,468,120
5	3,000,000	3,000,000 ÷ 1.2763 =	2,350,545
Total			12,039,312
Less Investment			(11,000,000)
NPV			1,039,312

5. No, NPV is not as simple to calculate as payback period so it may be difficult for some project managers to calculate. It will require a certain amount of financial acumen.
6. An advantage of the NPV method is that it is more accurate because it includes the time value of money. A disadvantage is that it is more complex to calculate.
7. Since the kiosk project has the highest internal rate of return at 5.5 percent, it ranks number 1. The franchise project ranks second with 5 percent IRR. The financial advisor project ranks last at 3 percent IRR.
8. No, it's complex to calculate IRR in this situation. IRR requires a financial calculator and thus it may be difficult for the project manager to calculate.
9. An advantage of IRR is that it is more accurate. A disadvantage is that it is more complex to calculate.
10. We recommend the NPV method. Since the managers at Best Investments Company stated that they are interested in an accurate method, providing the best investments as they hope to do for their clients, you might recommend the NPV method. Using the payback method, the kiosk project seemed to be the best selection, but when you look at NPV, it is evident that the franchise project is the best investment when comparing over the same amount of time.

Answers to Exercise 1.3

Your answers should be similar to the following:

1. A sample product description:

   Create kiosks that provide investment solutions to new and returning customers shopping at America's major malls. This kiosk must be attractive and easy to use in order to bring in new customers to our investment portfolio. The kiosk must have an easy-to-use interface for customers to start their investment portfolios. The kiosk will include a new and innovative application that allows customers to analyze and create a portfolio using our current investment products. The main customers for this product are those people who do not have computers in their homes, and those browsing the malls. The kiosk must be compelling enough to grab the customer's attention. The main reason for creating this kiosk is to increase our market by 10 percent.

Note that a product statement evolves as the project progresses, and the description may become far more detailed. Also, this description would need to be in greater detail if a vendor would be used to do the work (or portions of the work).

2. Some possible objectives might be:

(A) We will increase our total investment penetration based on this innovative product by 10 percent within two years. (B) With the innovation created by our new application and interface, we will increase our image within the industry within six months by having at least three independent articles printed in major industry magazines lauding our kiosks. (C) The application must be secure for the customer, and must use basic information, so that the customer does not have to have a lot of information to start their portfolio.

3. Some of the deliverables might be:

Design, construction, and testing of the kiosk. Concept, design, and implementation (including testing) of the interface and new investment application.

Marketing of the kiosk concept. Also, surveys and market research to ensure that market increase is achieved, and that the designs will be innovative.

4. Jim's responsibilities will be to ensure that the project is properly planned, executed, and managed. Specifically his responsibilities should include:

- Set standards and policies for the project's work and establish and communicate the project procedures to the project team and stakeholders and any contractors used on the project.
- Identify activities and tasks, resource requirements, project costs, project requirements, and performance measures.
- Ensure all project information is documented.
- Communicate status to management, stakeholders, and the team as needed.
- As the project proceeds, ensure that the ongoing plan and schedule accurately reflect cost, time, and performance as the plan is executed and make any corrective steps as necessary.

For authority, Jim could require the following:

- Control over the budget.
- The ability to choose, add, and remove members from the team.
- Authority to negotiate and manage the contract terms and the contractor. Contract management might include requiring status and specific performance measurements from the contractor. Also, the project manager should have input into performance reviews for the work performed on the project.
- Help from management to escalate and solve major project issues.
- Work on an equal basis with functional managers within the company to get issues solved.
- Create, change (with appropriate approval), and communicate the project plan and focus as needed.

5. Yes, it is an excellent idea to write the project manager's responsibility and authority into the charter (as well as other roles and responsibilities, if possible). It is better to have it in writing rather than just assumed. If issues come up in the project in which he or she needs to assert authority, the project manager will then be able to point to the charter to help support his or her actions.
6. You have been given a budget estimate of $5 million, and you can start with that as your cost estimate, although you will need to state that one of your planning deliverables will be to create a more accurate cost estimate. For resources, you might initially list in the charter that you will need a market researcher, functional team members (from the investment portfolio department and IT groups), kiosk builders (you might consider a contractor with this experience), and marketing/sales people to sell the kiosks at the malls.
7. Martha Frederick or a senior manager actually issues the project charter. Jim Thoroughgood, the project sponsor, key stakeholders, and other key major senior managers will sign the project charter.

Answers to Exercise 1.4

Note that the answers you have do not need to match the answers provided. You may think of other information or justifications besides those given.

1. A sample purpose statement:

   The purpose of this project is to create a plan to help increase investment penetration by 10 percent and include a way to measure it. The project will research the market demand for the Internet investment project. The product of the project is actually just a plan based on solid market research and a measurement method to ensure the market increase can be quantified.

   Note: It may appear that the team's purpose is to increase market share, but it is solely *to create a plan* to increase market share.
2. The following are some possible deliverables. You may think of others.
   - A market research report. This would be a critical success factor, because without it, you would not know the competition or the market share you could obtain. If research was done for the original project, you would want to update or include it in this document.
   - A survey to find out why people aren't using the current program. This survey is not required—your plan could use the research as a baseline, and this might add a great deal to the quality of your plan.
   - A recommendation. This could be part of the plan, but the recommendation could supply what steps you would include in the plan, such as particular advertising, or improvement of the Internet program, and support for why they should be done. This may not be a critical success factor but again would help with the quality of the plan.
   - A plan. This is a critical success factor—the product of the project.
   - A way to measure the current market share of investment programs, and a way to measure the market share after the plan is implemented. This is a critical success factor.

3. Some possible objectives might be:
   - Create an implementable plan to increase Internet program market share by 10 percent within three months. You may measure whether the plan is implementable by ensuring time and resources are applied, and that all tasks are approved by possible owners of the tasks. All the tasks should be based on specific research or survey results.
   - Create a tool that can be systematically applied to measure market improvement for the program at predefined times during the plan's implementation to show increase or decrease from baseline.
4. Some assumptions might be:
   - The output of this project is only a plan. No steps will be taken to actually improve market share at this time.
   - The market research will be as accurate and timely as possible.
   - A survey will accurately reflect the attitudes of typical users of the Internet program.
   - You have the expertise on the team to know what kind of tasks to implement to increase market share for the program.
5. Some constraints might be:
   - The team is constrained by the remaining budget to do the research, survey, and plan creation.
   - The research team must use only the tools and knowledge it has. (Note: This is a good test to see if the stakeholders would consider getting some expert research help for the team.)
6. No, you will probably not need a statement of work (SOW) because you will not be using any outside contractors. Sometimes people call this scope statement an SOW, but it is usually used for contractors. If you use some kind of outside help to perform the survey to gather data about issues with the current Internet program, you would need to create an SOW for their part of the work.

Answers to Exercise 1.5

Note that the answers you have do not need to match the answers provided. You may think of other information or justifications besides those given.

1. The stability of the scope might be around 60 percent confidence factor. It is very well defined and of short duration. The team is already a month into the project, so it should have a fairly high confidence factor. But because two key stakeholders have not approved the scope statement you cannot give the stability a high rating. This is especially true based on the success statement that the sponsor has provided. The key stakeholders as well as the project team will probably need a more measurable success definition to understand what excellent market research and implementable plan mean.
2. Some reasons the scope might change:

   During market research, the team may find an alternative research path it did not originally think of, requiring more time to include more research. Another scope change might be that the team may find that it needs someone to audit the completed plan, to ensure that all tasks listed can be implemented. The project team may be asked to actually start implementing some of the tasks it has included in the plan before the plan is actually signed off or this project is over. The sponsor might start getting anxious and ask the team to get the work done more quickly because the market is turning so quickly.

With a stability factor of 60 percent, the scope could change quite often. Since two stakeholders have not approved it, the scope could change a great deal in the next two weeks (and if so, adjustments would need to be made to the plan). Once the stakeholders approve the plan, stability may go up to 90 percent, and the scope might change only about every two weeks or once a month.

3. Fred's decision to hire an independent contractor would have an impact on the in-house researchers. They may feel their integrity and research methods are under question. This could impact the results of the project, with the team slowing to figure out why this independent research is necessary and to analyze what value another research effort will bring the project. Of course it would increase the schedule and budget. It will take time to find a firm, define the statement of work, hire the firm, and manage them. This could increase the project's schedule to at least a month or more. It will increase the project budget since it will cost money to hire the firm and time to manage the vendor. It would change the quality of the work—it could actually increase it or decrease it, depending on the standards and reputation of the firm hired.

4. To request the change and hire an independent contractor, Fred needs to go through the formal change request process that Betsy will create in the scope management plan. In that plan, she will describe how people are supposed to submit change requests. The data requested and what needs to be included in the analysis should be:
   - What is the requested change.
   - Why is the change needed. Fred will need to document a compelling business justification to find support for this change.
   - What is the impact on schedule, budget, quality, deliverables, or goal. Include any analysis about the change. Include any information about who has reviewed this impact to ensure a good analysis was completed.

5. Before she can approve the change, Betsy will need to come up with some kind of scope approval authority matrix for estimated impacts. The following table illustrates such a matrix.

Approval/Impact	Cost	Schedule	Quality
Project manager	<$200	< one week	Include or exclude some quality measures
Management stakeholder	$200 to < $500	< one week	No approval needed
Sponsor	= or > $500	> one week	No approval needed
Customer	No approval needed	> one week	Include or exclude some quality measures

This matrix shows the various criteria that a person needs to approve based on a schedule of three months and a budget of $50,000. In this case, the project manager needs to approve everything, but could approve a change under $200 without its being approved by anyone else (and if there weren't many of them!). However, if the schedule changes or a cost change is greater than $200, the project manager would need to get a management stakeholder's approval as well.

Betsy might set up biweekly change reviews, based on how often she thinks change might occur and how often she needs a change review board to look at the submitted changes.

6. The scope management plan is important because the project manager and the team know how to react to requests for change when they occur. The team members will be able to manage change (which is inevitable), rather than let the change manage them. It will describe the criteria needed to analyze the change, and the thresholds for approval of the change. In this manner change will be organized, managed consistently, and communicated regularly and equally to all stakeholders.