

# SOLUTIONS MANUAL



## **CHAPTER 2**

### **Project Selection and Prioritization**

#### **LEARNING OBJECTIVES**

This chapter presents a broad introduction to project management. After completing this chapter, each student should be able to perform the following:

1. Explain in your own words the strategic planning and portfolio management processes.
2. Compare strengths and weaknesses of using financial and scoring models to select projects.
3. Describe how to select, prioritize, and resource projects as an outgrowth of strategic planning.
4. Given organizational priorities and several projects, demonstrate how to select and prioritize projects using a scoring model.
5. From a contractor's viewpoint, describe how to secure projects.

#### **TEACHING STRATEGIES**

- Generally the first thing I do in this chapter is to ask the students about their example projects. Most of the student teams will not have met with their sponsors yet. I encourage them to do so as soon as possible. I ask them to tell me why the agency selected this particular project. Often they are not aware. I use that as the basis for this chapter.
- Remind the students that while the concepts behind many project management techniques are the same for all organizations, the mechanics of how they are performed can vary widely. Project selection, for example, can be very simple in a small organization or highly structured in a larger organization. Nevertheless, all organizations should use the idea of starting with strategic planning, identifying potential projects, using appropriate criteria, and choosing the set of projects that help the organization best to achieve its goals. In practice, however, some organizations decide one project at a time without looking at the big picture.
- Tell the students that in many cases they may have limited involvement in project selection and prioritization decisions, but those decisions will have a major impact on their projects, so they need to understand both how the decisions were made and the rationale behind them.
- One topic that lends itself to a quick breakout session is SWOT analysis. I like to give a scenario for a local government organization, sports organization, or company that is in the news and challenge the students to brainstorm a few strengths, weaknesses, opportunities, and threats. I will ask each team to report on one of those four areas. I then ask the students how this knowledge can help them decide which projects they want to pursue. This introduces the concept of multiple criteria decision-making.
- I then introduce the mission statements for both our university and our college of business. I ask the students what they can tell me about the mission or vision statements

for their present organizations (Many of our MBA students work full time and many of our undergraduates work part time.). We then discuss how this knowledge can be helpful in selecting projects that will help achieve the vision and mission. Often, students do not claim to know their organizational vision and mission. I encourage them to find those statements and try to understand how they should guide behavior.

- Show both Exhibits 2.5 and 2.6 to get students thinking about what a portfolio really means. I relate a project portfolio for an organization to a personal financial portfolio since most students have had finance and can remember diversifying. Either to follow-on one of the earlier breakouts, or as a standalone breakout, I ask students to brainstorm potential projects of each type shown in Exhibit 2.6 for a particular company or other organization. You can even use your own university.
- Since our entrepreneurship majors need to take project management, I remind them that a vast majority of work in young organizations is project based.
- Quickly present Exhibit 2.8 to emphasize that net present value (NPV) is the most commonly used financial model in project selection, but that other methods are available.
- For another breakout, give a scenario faced by an organization (real or fictitious). Ask students to first brainstorm potential criteria for selecting projects in that situation. The students then weight the projects on each criterion. When they report out, ask them to give the rationale behind their decisions.
- Ask the students to use a scoring model to select and prioritize projects. Demonstrate with Exhibits 2.11 and 2.12. Exercise 1 or 2 could be used for this breakout. Alternatively, with some prior setup of generating several possible projects, a continuation of the scenario of the local organization described in the previous bullet could be used to add authenticity. Yet another alternative is to have the students in groups select a type of car to buy. They will need to decide on the selection criteria first.
- I like to point out Exhibit 2.13 (Alternative Breaks Project Site Selection). I emphasize both how this is an example of selecting projects based upon multiple criteria and that we will have numerous places throughout the course where we will demonstrate points with this same integrated project.

## **LECTURE AND WORKSHOP OUTLINE**

### **2.1 Strategic planning process**

The company's leadership performs strategic planning to set direction.

Strategic analysis

Internal and external analysis using SWOT.

Guiding principles

Vision (preferred future state) and mission (what we stand for and how we will operate) statements, perhaps purpose and values also.

Strategic objectives

Annual goals to help achieve vision and mission.

Flow-down objectives

In larger organizations an expansion on strategic objectives.

### **2.2 Portfolio management**

Since projects are investments, ensuring the best set of projects is selected.

**Portfolio**

A collection of projects or programs and other work that are grouped together to facilitate effective management of that work to meet strategic business objectives.

**Program**

A group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually.

**Subproject**

A smaller portion of the overall project created when a project is subdivided into more manageable components or pieces.

**Assess organization's ability to perform projects**

Understanding the type and amount of projects the organization can successfully perform.

**Identify potential projects**

Systematically and entrepreneurially by everyone in the organization.

**Methods for project selection**

Based upon organizational priorities, including financial and other considerations.

**Using a cost-benefit analysis model to select projects**

Comparing expected project costs with benefits often by using net present value analysis.

**Using a scoring model to select projects**

When multiple criteria such as timing, risk, and resource needs are important in selection decisions.

**Prioritizing projects**

Once selected determining when each project will start and how conflicts will be resolved.

**Resourcing projects**

After the priorities of each project has been determined, leaders should start assigning resources from the highest priority project down until resource availability limits additional projects.

**2.3 Securing projects**

Client company perspective of finding contractors to perform and contractor company perspective of finding projects to perform.

**Identify potential project opportunities**

Contractor companies use many methods to uncover possible projects.

**Determine which opportunities to pursue**

Decide whether to pursue all projects or only select projects.

**Prepare and submit project proposal**

Proposals often include technical, management, and financial considerations.

**Negotiate to secure the project**

Both parties need to agree to terms that make sense.

**CHAPTER REVIEW QUESTIONS – SUGGESTED ANSWERS**

1. List and describe each step in the strategic planning process (objective #1, pp.28-31).
  - Strategic analysis – analyze strengths and weaknesses within the organization and opportunities and threats external to the organization.
  - Guiding principles – create statements of organizational vision, mission, purpose and/or values to guide decision-making.
  - Strategic objectives – often annual planning to establish short and long term results that will support guiding principles.
  - Flow-down objectives – optional for large or complex organizations to ensure that appropriate goals are established.
  - Portfolio alignment – selecting a set of projects to support organizations’ goals.
  
2. Name at least four things a mission statement should include. (objective #1, p.30)  
 The mission statement should include the organization’s purpose, beliefs, core values, culture, primary business, and primary customers.
  
3. What does the strategic analysis acronym SWOT stand for? (objective #1, p.28)  
 Strengths, weaknesses, opportunities, and threats.
  
4. What is the most widely accepted financial model for selecting projects? (objective #2, p.36)  
 Net present value (NPV) is the most widely accepted model as all the other models, though offering additional perspective, have more weaknesses.
  
5. What are some advantages and disadvantages of using a financial model for selecting projects? (objective #2, pp.37-38)  
 Financial models are useful in ensuring that selected projects make sense from a cost and return perspective, but they do not take into account a company’s strategic goals, so objectives, timing, resource needs, and risk should often be considered also.
  
6. What are some advantages and disadvantages of using a scoring model for selecting projects? (objective #2, pp.38-40)  
 Scoring models allow leadership teams to perform sensitivity analyses—that is, to examine what would happen to the decision if factors affecting it were to change. They are more time-intensive than financial models.
  
7. What are some common reasons for project failure? (objective #3, p.33)
  - Not enough resources
  - Not enough time
  - Unclear expectations
  - Changes to the project
  - Disagreement about expectations

8. Who should be involved in the second part of aligning projects with the firm's goals, which is identifying potential projects? (objective #3, p.35)

All parts of the organization should help identify potential projects.

9. If there is a conflict between resource needs for two projects, who decides which one gets the needed resources first? (objective #3, p.41)

Generally this is determined by the project sponsor; under especially important circumstances, the decision may require the leadership team.

10. In a project scoring model, why is each decision criteria given a weight? (objective #4, p.38)

The weights are assigned according to each criterion's relative importance. Therefore, the more important criteria will have a greater effect on the outcome than criteria deemed less important.

11. What purpose do sensitivity analyses serve in using scoring models to choose projects? (objective #4, p.39)

Allows decision makers to examine what would happen to the decision if factors affecting it were to change.

12. If several projects have close scores as the result of a scoring model, what can be done to break the virtual tie? (objective #4, p.39)

The group can use other criteria or discussion to break a tie.

13. Why might a contractor company perform a SWOT analysis prior to bidding on a potential project? (objective #5, p.42)

A quick SWOT analysis could be used to decide whether to pursue a potential project. Decision makers can also ask how well a potential project will help achieve their objectives. If they determine a project will help achieve their objectives, the next considerations are the cost to pursue the work and the probability of successfully securing the project given the likely competition. A company frequently considers risks both of pursuing and not pursuing a potential project. Finally, does the company have the capability to perform the work if it is awarded?

14. Why is it important for a contractor to understand the source selection criteria a client uses to decide to whom they will award a project? (objective #5, p.43)

By understanding what a client is looking for, a contractor can demonstrate his company's capabilities in terms of the specific job proposed, thus increasing his chances of being selected for the work.

15. Name five things that may be negotiated between a client company and a contractor company. (objective #5, p.44)

- Amount of money to be paid
- Contractual terms
- Schedule
- Personnel
- Quality Standards
- Reporting Mechanisms

## DISCUSSION QUESTIONS – SUGGESTED ANSWERS

1. How might the internal and external parts of a SWOT analysis affect one another? (objective #1, Analyzing)

The internal analysis (elements within the project team's control) consists of asking what strengths and weaknesses the organization possesses in itself. The external analysis (elements over which the project team has little or no control) consists of asking what opportunities and threats are posed by competitors, suppliers, customers, regulatory agencies, technologies, and so on. Together, these two can give a company an idea of what its competitive advantage is relative to others in the market and where they should go from here.

2. Describe the interaction between vision and mission statements. (objective #1, Applying)

The vision is normally a description of a desired future state of the organization that may take multiple years of effort to achieve. The mission statement should evolve from the vision and be a means to achieve it.

3. How is a company's portfolio similar to and different from a financial portfolio? (objective #1, Evaluating)

A portfolio is "projects, programs, subportfolios, and operations managed as a group to achieve strategic business objectives." Project portfolios are similar to financial portfolios. In a financial portfolio, efforts are made to diversify investments as a means of limiting risk. However, every investment is selected with the hope that it will yield a positive return. The returns on each investment are evaluated individually, and the entire portfolio is evaluated as a whole.

4. What is the best way for an organization to prioritize among selected projects? Does it vary among organizations? (objective #2, Analyzing)

There are several ways to prioritize among selected projects, and the method(s) used may vary from organization to organization. If using a scoring model, further discussion and/or additional criteria can be used to prioritize among projects with similar scores. Executives may have pet projects, despite the scoring model results. And sometimes a single consideration (such as timing the debut of a new system) outweigh other criteria and lead to project prioritization.

5. Describe three different ways decision makers might select projects while considering both financial and non-financial factors. (objective #2, Remembering)
  - (i) Financial analysis can be the only method of selecting projects.
  - (ii) Financial analysis can be a screening device to qualify potential projects for consideration using a scoring model to make selection decisions.
  - (iii) Financial considerations can be one factor in a multifactor scoring model used to select projects.
  
6. Why is aligning potential projects with the parent organization's goals the first step in avoiding project failure? (objective #3, Analyzing)

Aligning potential projects with the parent organization's goals makes it far likelier that a project will receive support from company decision makers. This buy-in or good will can greatly impact the likelihood of a project succeeding.

7. Why is it good practice for organizations to identify twice as many potential projects as they plan to implement? (objective #3, understanding)

Some potential projects may not be a good fit. Any company that accepts practically every potential project will probably waste some of its resources on projects that do not support its organizational goals.

8. Suppose you are purchasing a new car, and you decide to use a scoring model to decide among four options. What would be your top three criteria and what would be each criteria's relative weight? (objective #4, evaluating)

Example: Appearance—5 (on 1-5 scale of importance)  
 MPG—3  
 Cost—2

9. Under what circumstances should a selected project take precedence over other selected projects? (objective #4, analyzing)

If a project is urgent, its delay would be extremely costly either financially or in terms of hoped-for benefits, or it is mandated by the government or other controlling body.

10. If you are a contractor looking for project work, why might you decide *not* to pursue a particular project opportunity? (objective #5, synthesis)

You might decide not to pursue an opportunity if your company had no strategic advantage and/or was likely to be outbid by a competitor; you do not have the resources to complete the project according to its performance criteria; or if being awarded this contract would inhibit your chances at other work that is a better fit for your company.

11. What are the four main areas of competency a client company is looking for in a project manager? How can you best demonstrate these competencies to a potential client? (objective #5, applying)



Technical, Management, Financial, Operational; show examples/references for previous work; come up with a risk management plan, etc.

### ***PMBOK® Guide Questions***

1) A collection of projects, programs, and operations managed as a group to achieve strategic objectives is called a:

- a) Process
- b) Portfolio
- c) Subprogram
- d) Life cycle

Answer: b  
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2) Projects may be undertaken as a result of any of the following strategic reasons except:

- a) Social need
- b) Market demand
- c) Executive discretion
- d) Environmental considerations

Answer: c  
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3) A narrative description of products, services or results to be delivered by the project is a:

- a) Request for information
- b) Business case
- c) Project statement of work
- d) Elevator pitch

Answer: c  
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4) Program management helps determine the optimal approach for managing interdependent projects in order to achieve benefits and control. Program management activities might include all of the following except:

- a) Aligning organizational and strategic direction
- b) Managing shared client relationships
- c) Resolving issues and change management
- d) Resolving resource constraints

Answer: b  
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- 5) A project statement of work (SOW) would use or include information from each of the following sources except:
- a) Project charter
  - b) Strategic plan
  - c) Business need
  - d) Product scope description

Answer: a  
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- 6) All projects should be aligned with their organization's strategic plan, which includes the organization's vision, goals, and objectives. Which of these is the definition of a vision statement?
- a) Conveys a larger sense of organizational purpose, and is both inspiring and guiding.
  - b) Describes short and long term results along with measures to determine if they have been achieved.
  - c) Includes the organization's core purpose, core values, beliefs, culture, primary business, and primary customers.
  - d) Is SMART: specific, measurable, achievable, results-based, and time-specific.

Answer: a  
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- 7) Which group within the organization is responsible for integrating data and information from corporate strategic projects, and using corporate measurement systems to evaluate how strategic objectives are being fulfilled?
- a) Chief Information Officer
  - b) Project Management Office
  - c) Project Sponsors
  - d) Operations Management

Answer: b  
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- 8) The document that includes the necessary information to determine whether a project is worth the required investment, and is used for decision making by upper management, is called the:
- a) Project Scope Statement
  - b) Project Charter
  - c) Business Case

d) Case Study

Answer: c

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9) The author notes that contractors seeking external customers should also use a project selection / portfolio alignment process. Once an external customer and contractor have reached a consensus on the initial intentions for the contracted work, their understanding is documented in:

- a) A statement of work (SOW)
- b) A business case
- c) An agreement
- d) A strategic alliance

Answer: c

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10) A business case typically contains information regarding the business need and a financial analysis. Which financial model divides the cash flow by the initial cash outlay?

- a) Benefit-Cost Ratio (BCR)
- b) Internal Rate of Return (IRR)
- c) Net Present Value (NPV)
- d) Payback Period (PP)

Answer: a

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## EXERCISES – SOLUTIONS

- Complete the following scoring model. Show all your work. Tell which project you would pick first, second, third, and last. How confident are you with each choice? If you lack confidence regarding any of your choices, what would you prefer to do about it?

Project/Criteria & Weight	Criteria 1 10	Criteria 2 6	Criteria 3 4	Weighted Total Score
Project A	4	3	5	
Project B	3	2	3	
Project C	2	4	3	
Project D	1	3	4	

Project/Criteria & Weight	Criteria 1 10	Criteria 2 6	Criteria 3 4	Weighted Total Score
Project A	4 40	3 18	5 20	78
Project B	3 30	2 12	3 12	54
Project C	2 20	4 24	3 12	56
Project D	1 10	3 18	4 16	44

I would select Project A first. I am quite confident about that selection since Project A scored considerably higher than all others. The second project to be selected is Project B, but Project C is in a virtual tie, so I would prefer to discuss the relative merits of each, perhaps considering additional “tie-breaking” criteria, before making the final selection.

Project D is a distant fourth, so if given the ability to perform three projects, I would be very comfortable with A, B, and C.

- Complete the following scoring model. Show all your work. Tell which project you would pick first, second, third, and last. How confident are you with each choice? If you lack confidence regarding any of your choices, what would you prefer to do about it?

Project/Criteria & Weight	Criteria 1 10	Criteria 2 7	Criteria 3 3	Weighted Total Score
Project A	1	3	4	
Project B	3	5	3	
Project C	5	4	3	
Project D	2	3	1	

Project/Criteria & Weight	Criteria 1 10	Criteria 2 7	Criteria 3 3	Weighted Total Score
Project A	1 10	3 21	4 12	43
Project B	3 30	5 35	3 9	74
Project C	5 50	4 28	3 9	87
Project D	2 20	3 21	1 3	44

I would pick Project C first and Project B second. I feel confident in those selections as the scores are quite different than the others. I would be hard pressed to select a third project without additional information. Projects A and D are in a virtual tie.

3. Pretend you are the leadership team for a pharmaceutical company that is in a difficult financial situation due to patents that have expired on two of your most profitable drugs. Brainstorm a list of criteria by which you would select and prioritize projects. Weight the criteria.

Answers will vary. The criteria developed would apply to projects that either are starting with a new compound (entirely new drug which may take a long time to get to market), a variation on a compound that is already partially studied (getting a variation of a drug to market sooner), or the purchase of a drug another company has fully or partially developed (perhaps getting the drug to market much quicker). Some criteria might include: speed in getting a new pharmaceutical to market, probability of success, cost of the project, and similarity with the company's existing products (alignment). The weightings can also vary, but students should be prepared to explain the logic behind why they chose the weights they did. Speed in getting a drug to market should be one of the highly rated criteria.

4. Pretend you are the leadership team of a manufacturing company that is currently challenged by low-cost competition. Brainstorm a list of criteria by which you would select and prioritize projects. Weight the criteria.

Answers will vary. Projects may include cost reduction improvement projects and new product development projects. Cost will certainly be one of the higher rated criteria. Others may include probability of success and alignment with current products and/or organizational strategy.

## **EXAMPLE PROJECT**

The primary thing students can do in this chapter regarding their example project is to discover why the organization selected the project. This involves learning enough of the organization's vision and mission to understand how the project will help achieve both. Remind students that executives consider projects to be investments (of money, workers time, or both) and they want to have confidence they will get a good return on their investment. I generally do not have an assignment for this, but have a class discussion. I tell the students I want them to be able to articulate how the project will be of value to the organization. This not only gives the students a great start on writing the business case section in the project charter (Chapter 4), but it also starts to help the students develop a strong attachment to their project. This can lead to more student work on the project and to discussions regarding passion for a project and how that helps when projects go through difficult periods.