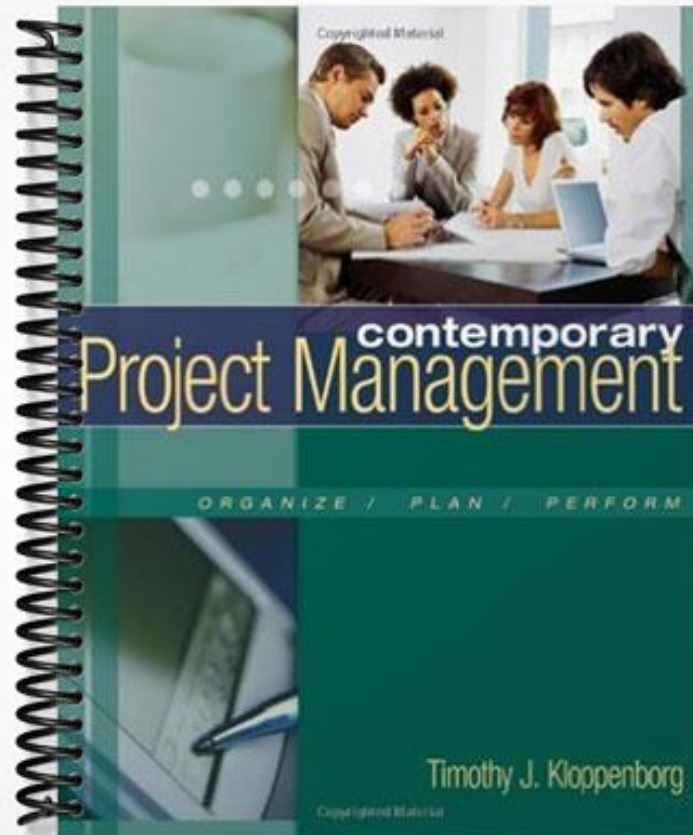


SOLUTIONS MANUAL



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:

- Describe the strategic planning process.
- Describe the portfolio alignment process.
- Itemize strengths and weaknesses of using financial and scoring models to select projects.
- Describe how to select and prioritize projects as an outgrowth of strategic planning.
- Given organizational priorities and several projects, demonstrate how to select and prioritize projects using a scoring model.
- Determine who should identify potential projects in an organization.

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.
- I 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.
- I also 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.
- I will 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. 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.

- I quickly present Exhibit 2.6 to emphasize that net present value (NPV) is most commonly used in project selection, but that other methods are available.
- For another breakout, I give a scenario faced by an organization (real or fictitious). I then ask students to first brainstorm potential criteria for selecting projects in that situation. The students then weight the projects. When they report out, I ask them to give the rationale behind their decisions.
- I ask the students to use a scoring model to select and prioritize projects. I demonstrate with Exhibits 2.8 and 2.9. 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.

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 alignment

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

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 and criteria for project selection

Based upon organizational priorities, including financial and other considerations.

Using a financial 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.

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.
 - 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. Why are multiple criteria project selection models preferred?

Financial criteria is one factor in selecting an appropriate project portfolio, but additional criteria concerning how well each potential project supports organizational objectives, timing, resource needs, and risk are also often critical.
3. What happens to a project proposal that does not meet a “must” objective in a project selection system?

It is evaluated just as all other potential projects to see how well it fits the organization's selection criteria.
4. What does the strategic analysis acronym SWOT stand for?

Strengths, weaknesses, opportunities, and threats.
5. Which parts of SWOT are internal? Which parts are external?

Internal – strengths and weaknesses of the organization.
External – opportunities and threats from outside the organization.

6. What are some examples of guiding principles an organization's leaders might develop after they have completed strategic analysis?

Vision – a description of the desired future state of the organization.

Mission – the organization's reason for existing, beliefs, core values of how people will be treated and decisions will be made, the business the organization is in, and the primary customers of the organization.

Sometimes mission is broken into separate statements such as purpose and values.

7. In what tense should a vision be written?

Future

8. Name at least four things a mission statement should include.

The mission statement should include the organization's purpose, beliefs, core values, culture, primary business, and primary customers.

9. Why should a mission statement be neither too specific nor not specific enough?

The mission statement should be specific enough to set direction, but not so specific that the organization precludes imagination.

10. In addition to short- and long-term results, what should strategic objectives include?

Strategic objectives should include measures to determine if they have been achieved.

11. What does the acronym SMART mean with regard to goals?

Specific, measurable, achievable, results-based, and time-specific.

12. What is the primary method of implementing organizational objectives?

Projects are the primary means of implementing organizational objectives.

13. What is the first step in avoiding common reasons for project failure?

The first step in avoiding common reasons for project failure is to carefully align potential projects with the goals of the parent organization.

14. Who should be involved in the second part of aligning projects with the firm's goals, which is identifying potential projects?

All parts of the organization should help identify potential projects.

15. How many potential projects should be identified in comparison to how many the organization plans to actually implement? Why?
One good rule of thumb is to identify about twice as many potential projects as the organization has the capacity to implement since upon close examination, some projects may not be a good fit and others may be impractical.
16. What is the most common financial analysis technique used in project selection? Why?
Net present value (NPV) is the most widely accepted model as all the other models, though offering additional perspective, have more weaknesses.
17. Which type of financial model would you normally use in project selection? Why?
Net present value (NPV) is straightforward both in calculation and in interpretation.

DISCUSSION QUESTIONS – SUGGESTED ANSWERS

1. Describe how to prioritize projects to ensure top management involvement.
First, have the top management discuss and agree upon the criteria that they will use to select and prioritize projects. The top management then needs to determine the relative weight of each criterion. Once they have formed these agreements, they should rate all potential projects by considering one criterion at a time. When a particular manager is not happy that a pet project is not rated highly, by being able to refer back to the agreements that the top managers have made regarding criteria, she or he is likely to stay actively engaged.
2. Describe all of the issues management must consider when determining priorities of projects.
The management needs to consider the urgency of each project, the cost of delays in achieving hoped-for benefits of each project, a variety of practical timing details such as how disruptive a project may get to be in a given time period, and limits on resources that may be needed for multiple projects.
3. Tell why gaining top management support is vital to project success.
The top management make selection and prioritization decisions regarding the project, they provide resources, and they can provide ongoing encouragement and support. Many projects face difficult periods, when extra resources or encouragement can make the difference in successful completion.
4. List and describe the steps in strategic direction setting.
 - 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 appropriate goals are established.
 - Portfolio alignment – selecting a set of projects to support organizations goals.
5. Describe how to conduct each portion of a SWOT analysis.
- Leaders of an organization need to perform internal analysis by very candidly assessing what internal strengths and weaknesses they have as an organization. They also need to perform external analysis by asking what opportunities and threats are posed toward the organization from sources such as competitors, suppliers, customers, regulatory agencies, emerging technologies, and so forth.
6. Describe what knowledge is gained from each portion of a SWOT analysis and how it helps project managers.
- Strengths – what the organization currently has the capability to do well.
 - Weaknesses – areas in which the organization is not competitive.
 - Opportunities – possible things a project team can do for additional success.
 - Threats – areas where outside competition may limit effectiveness.
 - Each of these provides insight into the possible choices of projects as well as how to structure each to capitalize on strengths and opportunities and to avoid or overcome weaknesses and threats.
7. Describe the interaction between vision and mission statements.
- 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.
8. List and describe the steps in prioritizing projects with a scoring model. Why are they performed in this order?
- (i) Decide if any projects are “must do” projects regardless of selection criteria. Select the “must do” projects first.
 - (ii) Brainstorm and agree upon decision criteria.
 - (iii) Weight the criteria to determine the relative importance of each. These three steps should be accomplished before considering individual projects since some people may try to manipulate criteria weights to favor a pet project if these steps are not performed first.
 - (iv) Identify all potential projects.
 - (v) Rate all projects on one criterion at a time. By comparing all projects on the same criterion, it is far easier to be objective and it is also much faster.

- (vi) Multiply the rating for each project by the weight assigned to the respective criterion to obtain a score for the cell.
 - (vii) Add the scores for each cell for each project to get project totals.
 - (viii) Sort by the highest project total scores.
 - (ix) Start selecting projects with the highest scores.
 - (x) Continue selecting projects based upon overall scores until available resources start to appear scarce. At that point, consider the merits of several projects that may have similar scores. Use your judgment to determine which of these borderline projects get selected. This is important as the scoring models are excellent for identifying top- and bottom-scoring projects, but other factors should be considered when selecting projects with similar scores.
9. Describe advantages and disadvantages of financial and scoring models in project selection.
- Financial models ensure that a portfolio of projects that collectively provide a return on the organization's assets are selected. Scoring models can include a financial criterion, but it must be recognized that additional criteria are also important. While financial considerations are important in project selection, they frequently are not enough.
10. Describe three different ways decision makers might select projects while considering both financial and non-financial factors.
- (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.

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.

2. 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. 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.