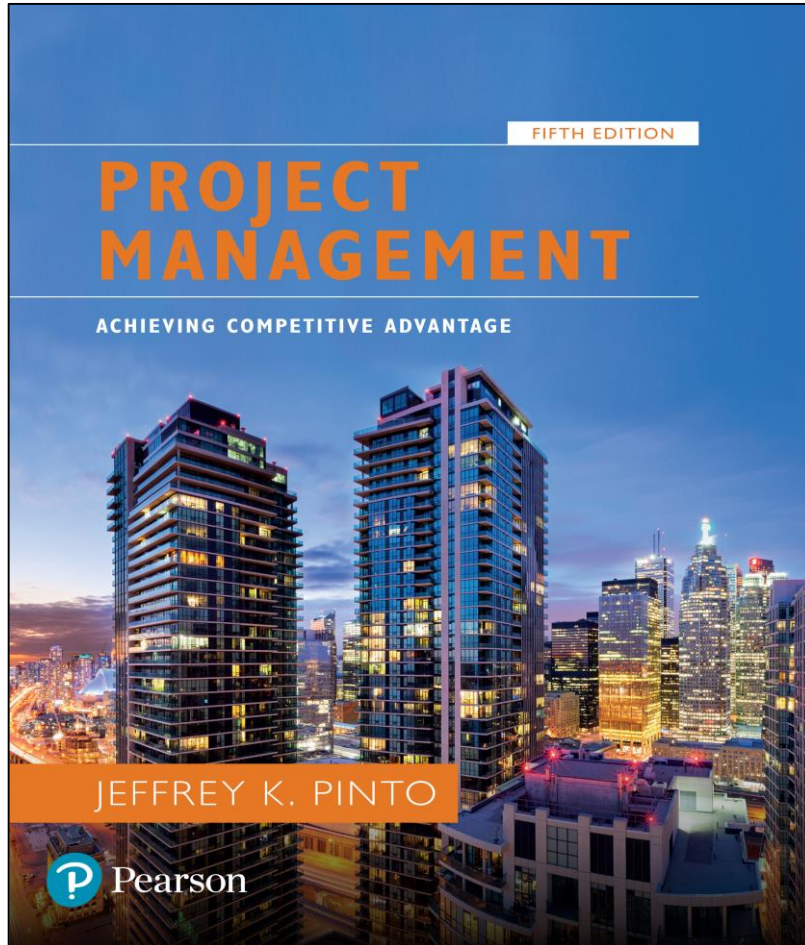


Project Management: Achieving Competitive Advantage

Fifth Edition



Chapter 3

Project Selection and Portfolio Management

Learning Objectives

3.1 Explain six criteria for a useful project selection/screening model.

3.2 Understand how to employ a variety of screening and selection models to select projects.

3.3 Learn how to use financial concepts, such as the efficient frontier and risk/return models.

3.4 Identify the elements in the project portfolio selection process and discuss how they work in a logical sequence to maximize a portfolio.

PMBOK Core Concepts

Project Management Body of Knowledge (PMBok) covered in this chapter includes:

- Portfolio Management (PMBok 1.4.2)

Project Selection

Screening models help managers pick winners from a pool of projects. Screening models are **numeric** or **nonnumeric** and should have:

- **Realism**
- **Capability**
- **Flexibility**
- **Ease of use**
- **Cost effectiveness**
- **Comparability**

Screening and Selection Issues (1 of 2)

1. **Risk**—unpredictability to the firm
 - a. Technical
 - b. Financial
 - c. Safety
 - d. Quality
 - e. Legal exposure
2. **Commercial**—market potential
 - a. Expected return on investment
 - b. Payback period
 - c. Potential market share
 - d. Long-term market dominance
 - e. Initial cash outlay
 - f. Ability to generate future business/new markets

Screening and Selection Issues (2 of 2)

- 3. **Internal operating**—changes in firm operations
 - a. Need to develop/train employees
 - b. Change in workforce size or composition
 - c. Change in physical environment
 - d. Change in manufacturing or service operations
- 4. **Additional**
 - a. Patent protection
 - b. Impact on company's image
 - c. Strategic fit

All models only **partially reflect reality** and have **both objective and subjective** factors imbedded.

Approaches to Project Screening

- Checklist model
- Simplified scoring models
- Analytic hierarchy process
- Profile models

Checklist Model

A checklist is a list of criteria applied to possible projects.

- Requires agreement on **criteria**
- Assumes all criteria are **equally important**

Checklists are valuable for recording opinions and stimulating discussion.

Simplified Scoring Models

Each project receives a score that is the weighted sum of its grade on a list of criteria.

Scoring models require:

- agreement on **criteria**
- agreement on **weights** for criteria
- a **score** assigned for each criteria

$$\text{Score} = \sum (\text{Weight} \times \text{Score})$$

Relative scores can be misleading!

Analytic Hierarchy Process

The AHP is a four step process:

1. Construct a hierarchy of **criteria and subcriteria**.
2. **Allocate weights** to criteria.
3. Assign **numerical values** to evaluation dimensions.
4. **Determine scores** by summing the products of numeric evaluations and weights.

Unlike the simple scoring model, these scores can be compared!

Figure 3.1 Sample AHP with Rankings for Salient Selection Criteria

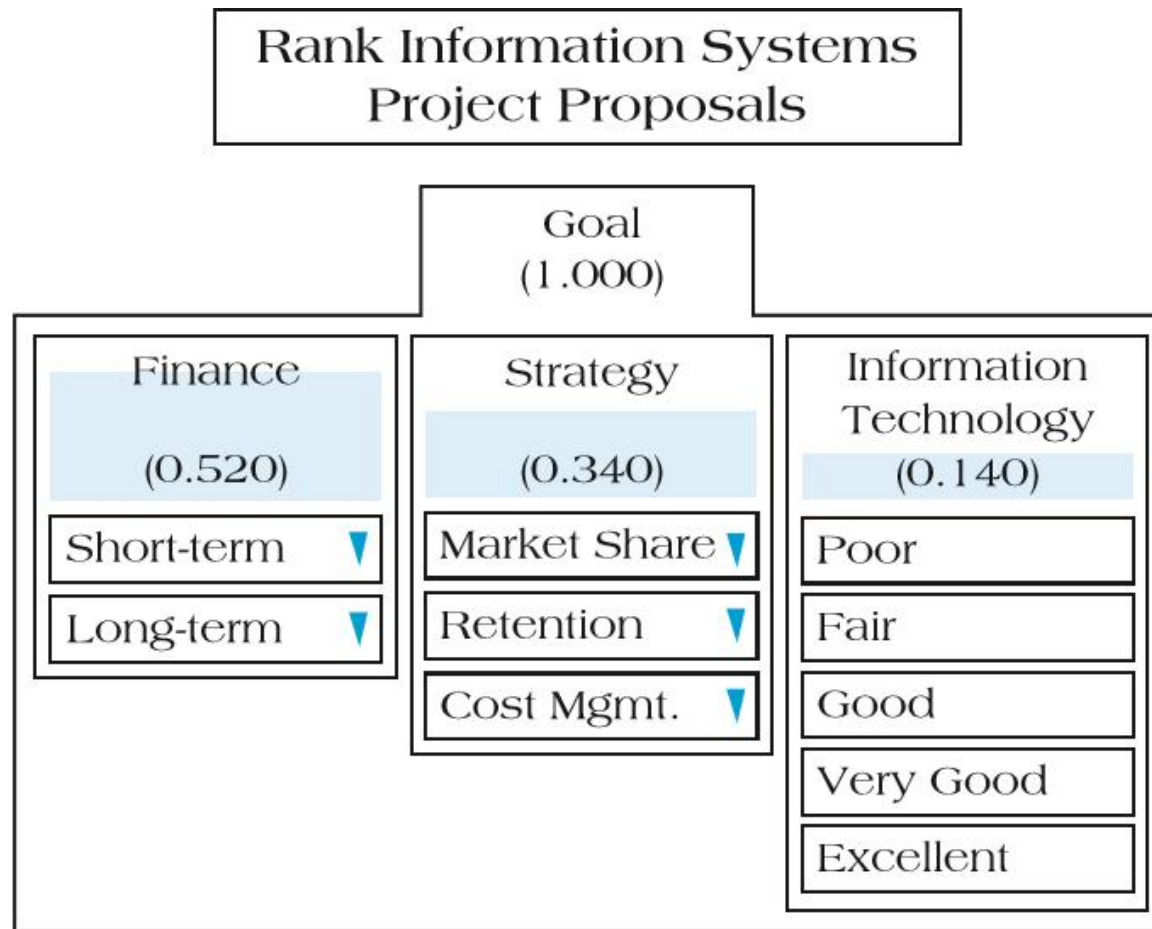
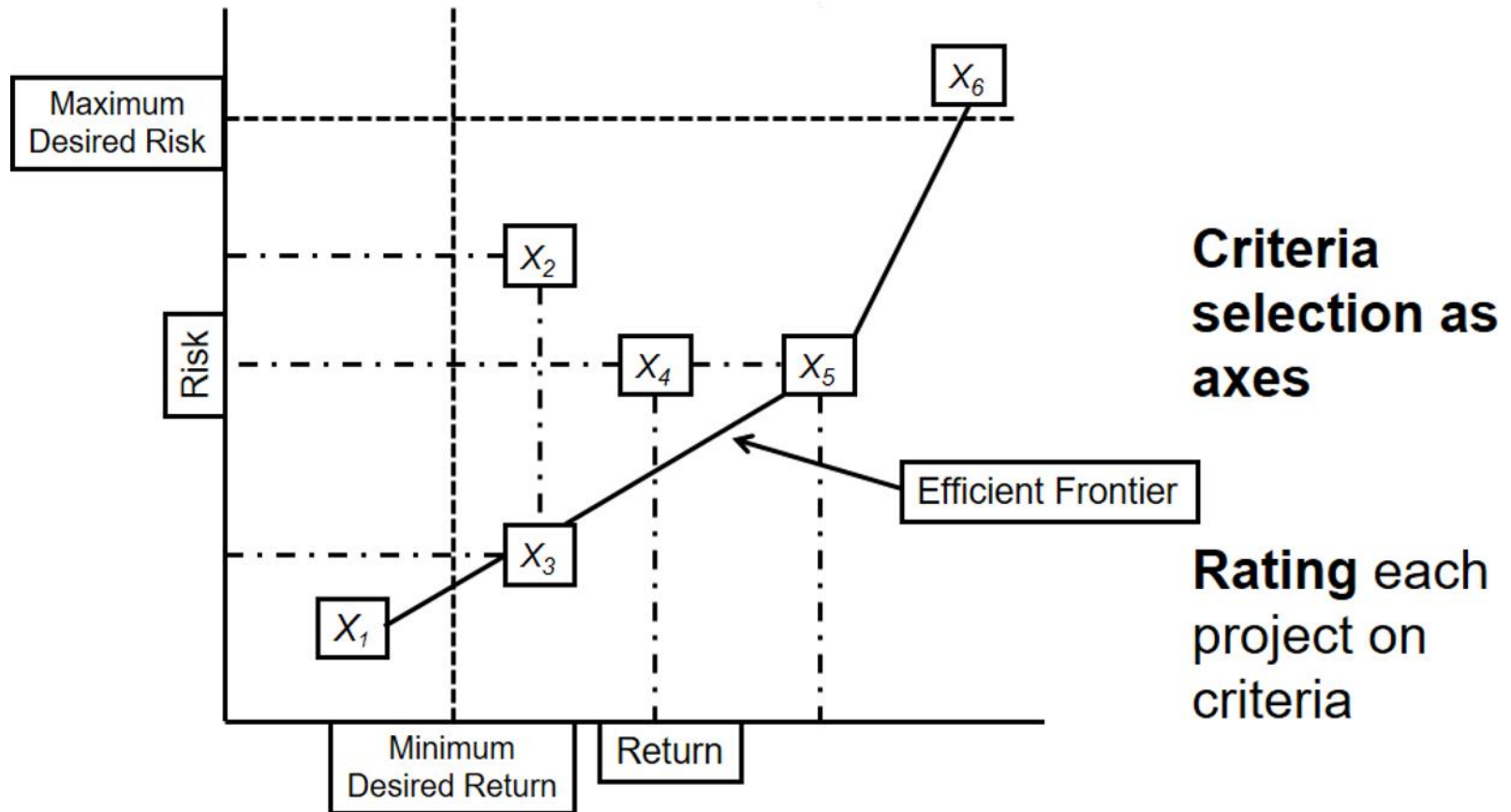


Figure 3.4 Profile Model



Financial Models

- Payback period
- Net present value
- Discounted payback period
- Internal rate of return

Payback Period

Determines **how long** it takes for a project to reach a breakeven point.

$$\text{Payback Period} = \frac{\text{Investment}}{\text{Annual Cash Savings}}$$

Cash flows should be **discounted**.

Lower numbers are **better (faster payback)**.

Payback Period Example (1 of 3)

Table 3.5 Initial Outlay and Projected Revenues for Two Project Options

	Project A Revenues	Project A Outlays	Project B Revenues	Project B Outlays
Year 0		\$500,000		\$500,000
Year 1	\$50,000		\$75,000	
Year 2	150,000		100,000	
Year 3	350,000		150,000	
Year 4	600,000		150,000	
Year 5	500,000		900,000	

Payback Period Example (2 of 3)

Table 3.6 Comparison of Payback for Projects A and B

Project A	Year	Cash Flow	Cum. Cash Flow
	0	(\$500,000)	(\$ 500,000)
	1	50,000	(450,000)
	2	150,000	(300,000)
	3	350,000	50,000
	4	600,000	650,000
	5	500,000	1,150,000
Payback = 2.857 years			

$$3 - \frac{50,000}{350,000} = 2.857$$

Divide the cumulative amount by the cash flow amount in the third year and subtract from 3 to find out the moment the project breaks even.

Payback Period Example (3 of 3)

Table 3.6 [continued]

Project B	Year	Cash Flow	Cum. Cash Flow
	0	(\$500,000)	(\$ 500,000)
	1	75,000	(425,000)
	2	100,000	(325,000)
	3	150,000	(175,000)
	4	150,000	(25,000)
	5	900,000	875,000
Payback = 4.028 years			

$$5 - \frac{875,000}{900,000} = 4.028$$

Divide the cumulative amount by the cash flow amount in the third year and subtract from 3 to find out the moment the project breaks even.

Net Present Value

Projects the change in the firm's value if a project is undertaken.

$$NPV = I_o + \sum \frac{F_t}{(1 + r + p_t)^t}$$

Where

F_t = net cash flow for period t

r = required rate of return

I = initial cash investment

p_t = inflation rate during period t

**Higher *NPV*
values are better!**

Net Present Value Example

Table 3.8 Discounted Cash Flows and NPV (I)

Year	Inflows	Outflows	Net Flow	Discount Factor	NPV
0		\$100,000	\$(100,000)	1.0000	\$(100,000)
1	\$20,000		20,000	0.8772	17,544
2	50,000		50,000	0.7695	38,475
3	50,000		50,000	0.6749	33,745
4	25,000		25,000	0.5921	14,803
Total					\$ 4,567

**The NPV
column total
is positive,
so invest!**

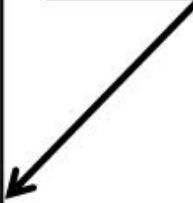


Table 3.9 Discounted Payback Method

Year	Project Cash Flow*	
	Discounted	Undiscounted
1	\$8,900	\$10,000
2	7,900	10,000
3	7,000	10,000
4	6,200	10,000
5	5,500	10,000
Payback Period	4 Years	3 Years

*Cash flows rounded to the nearest \$100.

Discount sum of cash flows by the company's required rate of return to get a more accurate payback period.

Internal Rate of Return

A project must meet a **minimum rate of return** before it is worthy of consideration.

$$IO = \sum_{n=1}^t \frac{ACF_t}{(1 + IRR)^t}$$

Higher *IRR* values are better!

where

ACF_t = annual after tax cash flow for time period t

IO = initial cash outlay

n = project's expected life

IRR = the project's internal rate of return

Internal Rate of Return Example

This table has been calculated using a discount rate of 15%.

Year	Discount Factor Inflows	Discount Factor at 15%	Discount Factor NPV
1	\$2,500	.870	\$2,175
2	2,000	.756	1,512
3	2,000	.658	1,316
Present value of inflows			5,003
Cash investment			5,000
Difference			\$ 3

The project does meet our 15% requirement and **should be considered further.**

Project Portfolio Management

The systematic process of selecting, supporting, and managing the firm's collection of projects.

Portfolio management objectives and initiatives require:

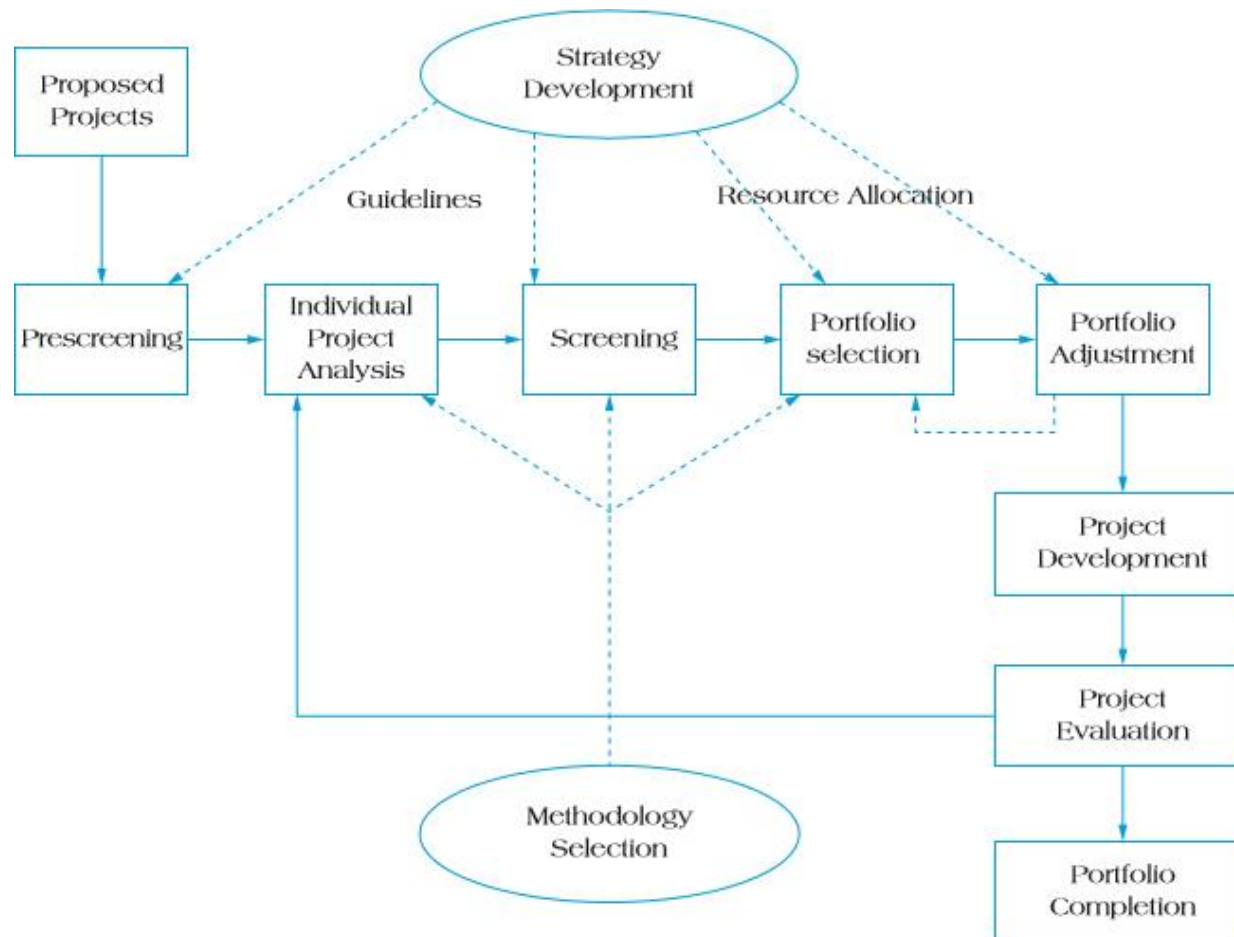
- decision making
- prioritization
- review
- realignment
- reprioritization of a firm's projects

The Portfolio Selection Process

The portfolio selection process is an integrated framework of interrelated steps and activities.

- Preprocess Phase
 - Methodology of selection and strategy
- Process Phase
 - Prescreening, individual project analysis, screening, portfolio selection, and portfolio adjustment
- Postprocess Phase
 - Project development, project evaluation, and portfolio completion

Figure 3.8 Project Portfolio Selection Process

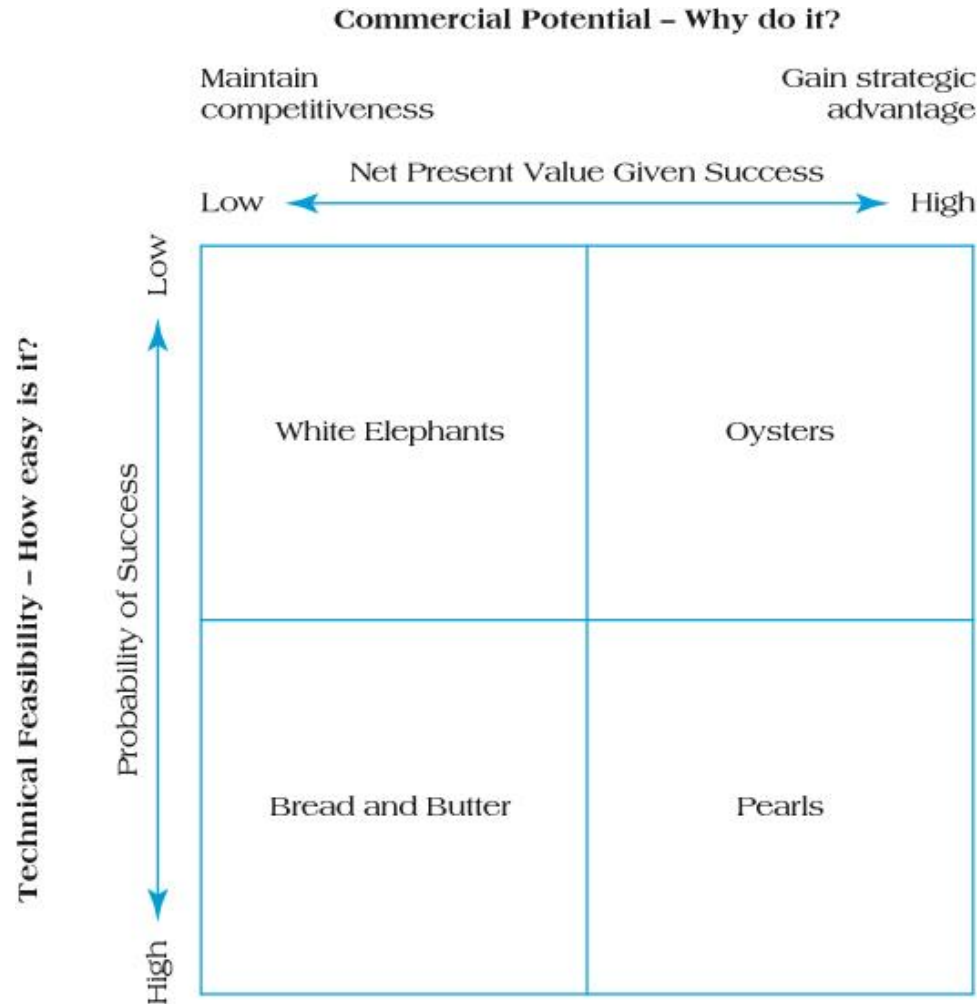


Developing a Proactive Portfolio

The project portfolio matrix classifies projects into four types according to commercial potential and technical feasibility:

- Bread and butter
- Pearls
- Oysters
- White elephant

Figure 3.9 Project Portfolio Matrix



Keys to Successful Project Portfolio Management

- **Flexible structure** and freedom of communication
- **Low-cost** environmental scanning
- **Time-paced** transition

Problems in Implementing Portfolio Management

- Conservative technical communities
- Out-of-sync projects and portfolios
- Unpromising projects
- Scarce resources

Summary

1. Explain six criteria for a useful project selection/screening model.
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4. Identify the elements in the project portfolio selection process and discuss how they work in a logical sequence to maximize a portfolio.

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