HM321 Engineering Economics
Fall 2024 – Lecture 12

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Bring Calculator Always

- Always bring your calculator with you in lectures
- Without practice you will not be able to do the calculations in your exams

Blank and Tarquin Chapter 4

PRESENT WORTH ANALYSIS

Present Worth Analysis

- Present worth analysis is one of the methods for comparing two or more mutually exclusive project alternatives
- Present worth analysis is also called discounted cash flow (DCF) analysis
  - In DCF analysis the interest rate is called discount rate
- The present worth is also referred to as present value (PV) or net present value (NPV)

From Proposals to Alternatives to Selection

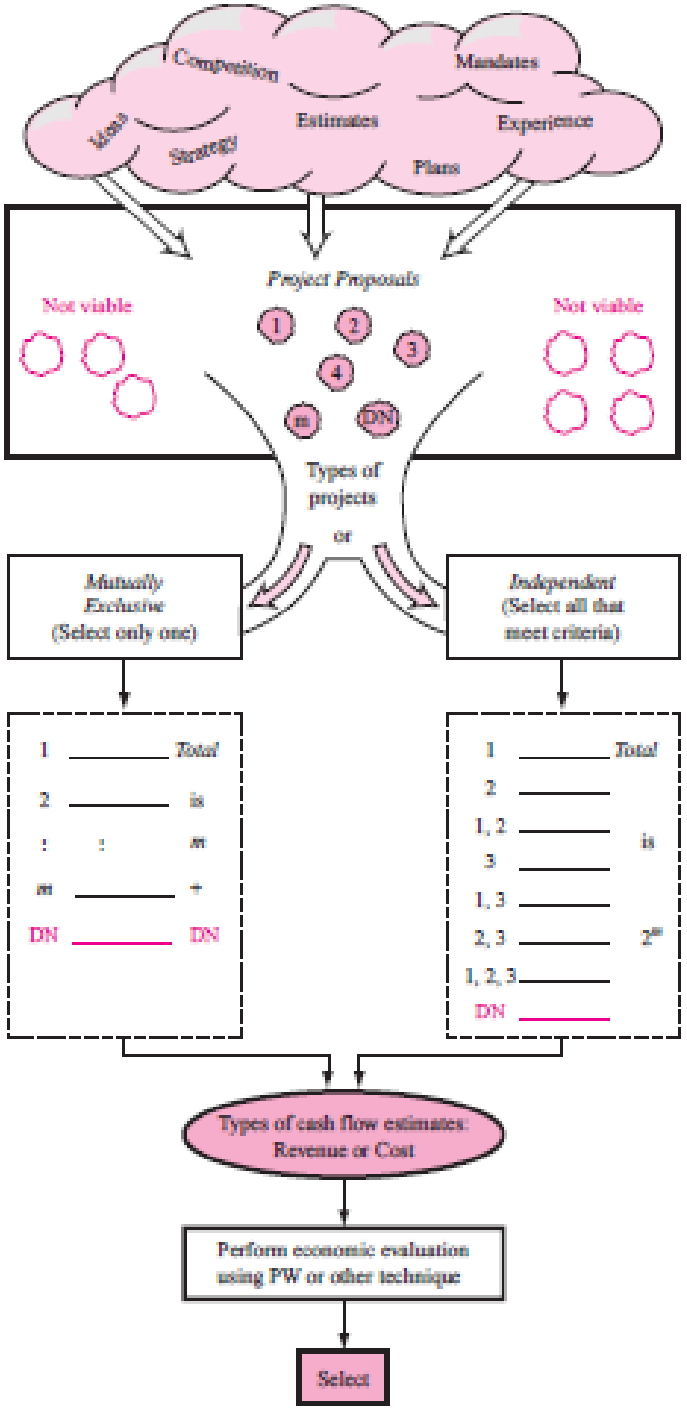

FIGURE 4.1
Logical progression from proposals to alternatives to selection.

Alternatives

- Alternatives are developed from project proposals to accomplish a stated purpose
- Only those projects are considered that are technically and economically viable
- Two types of alternatives:
  - **Mutually exclusive:** Only one of the viable project can be selected
  - **Independent:** More than one viable project may be selected for investment

“Do Nothing” Alternative

- Abbreviated as DN
- “Do nothing” alternative means do not invest in any project proposal and maintain the current status (status quo)
  - No new costs, revenues or savings
- Do nothing may or may not be an alternative
  - If one alternative must be selected then do nothing is not an alternative (e.g. to satisfy a legal requirement)

Formulating Alternatives

- For each alternative its future cash flows are estimated. There are two types of cash flow estimates:
- **Revenue:** Alternatives include estimates of both costs (cash outflows) and revenues (cash inflows)
- **Cost:** Alternatives include only costs
  - Revenues and savings are assumed equal for all alternatives
  - Also called service alternatives

PRESENT WORTH ANALYSIS OF EQUAL-LIFE ALTERNATIVES

Present Worth Analysis of Alternatives

- Precede costs by minus sign and receipts by plus sign
- For each alternative convert all cash flows to present worth (PW) using MARR. Apply the following criteria for selection
  - If there is only one alternative, select it for investment if PW > 0
  - For mutually exclusive alternatives, select the one with numerically largest PW
  - For independent projects, select all with PW>0

Reference

- Basics of Engineering Economy by Leland Blank and Anthony Tarquin, 2nd edition, McGraw-Hill