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School of Business

Performing Financial Projections

Performing Financial Projections

- Financial considerations are often an important aspect of the project selection process
- Three important methods include:
  - Net present value analysis
  - Return on investment
  - Payback analysis

See even more at:
https://web.njit.edu/~pkatia/FourYearArchives/FinancialControlsPM/_AxD_FC_Overview.pdf

Net Present Value (NPV)

$$NPV = \sum_{t=1}^{n} A_t / (1+r)^t$$

A is the amount of cash flow in year t
t equals the year of the cash flow
r is the discount rate

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NPV Analysis

- The **NPV analysis** is a method of calculating the expected net monetary gain or loss from a project by discounting all expected future cash inflows and outflows to the present point in time
- NPV means the return from a project exceeds the **opportunity cost of capital**—the return available by investing the capital elsewhere
- Projects with higher NPVs are preferred to projects with lower NPVs if all other factors are equal

Steps for Calculating NPV

1. Determine the estimated costs and benefits for the life of the project and the products it produces.
2. Determine the discount rate. A **discount rate** is the rate used in discounting future cash flows. The annual **discount factor** is a multiplier for each year based on the discount rate and year (calculated as 1/(1+r)t, where *r* is the discount rate, and *t* is the year).
3. Calculate the net present value by subtracting the total discounted costs from the total discounted benefits.

A Net Present Value Example

	A	B	C	D	E	F	G
1	Discount rate	10%					
2							
3	PROJECT 1	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
4	Benefits	$0	$2,000	$3,000	$4,000	$5,000	$14,000
5	Costs	$5,000	$1,000	$1,000	$1,000	$1,000	$9,000
6	Cash flow	($5,000)	$1,000	$2,000	$3,000	$4,000	$5,000
7	NPV →	$2,316					
8		Formula =npv(b1,b6:f6)					
9							
10	PROJECT 2	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
11	Benefits	$1,000	$2,000	$4,000	$4,000	$4,000	$15,000
12	Costs	$2,000	$2,000	$2,000	$2,000	$2,000	$10,000
13	Cash flow	($1,000)	$0	$2,000	$2,000	$2,000	$5,000
14	NPV →	$3,201					
15		Formula =npv(b1,b13:f13)					
16							
17							

Note that totals are equal, but NPVs are not because of the time value of money

Schwalbe, Information Technology Project Management, Sixth Edition, 2010

Detailed NPV Calculations

Discount rate	10%					
PROJECT 1	**1**	**2**	**3**	**4**	**5**	**TOTAL**
Costs	$5,000	$1,000	$1,000	$1,000	$1,000	$9,000
Discount factor*	0.91	0.83	0.75	0.68	0.62	
Discounted costs	$4,545	$826	$751	$683	$621	**$7,427**
Benefits	$0	$2,000	$3,000	$4,000	$5,000	$14,000
Discount factor*	0.91	0.83	0.75	0.68	0.62	
Discounted benefits	0	$1,653	$2,254	$2,732	$3,105	**$9,743**
Discounted benefits - discounted costs, or NPV →						**$2,316**
*Note: The discount factors are NOT rounded to two decimal places.						
They are calculated using the formula discount factor = 1/(1+discount rate)^year.						
You can access this spreadsheet on the companion Web site.						

Schwalbe, Information Technology Project Management, Sixth Edition, 2010

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NPV Considerations

- Some organizations refer to the investment year(s) for project costs as Year 0 instead of Year 1 and do not discount costs in Year 0
- The discount rate can vary, based on the prime rate and other economic considerations.
- You can enter costs as negative numbers instead of positive numbers, and you can list costs before benefits
- Project managers should check to see which approaches their organizations prefer when calculating NPV

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Return on Investment (ROI)

$$ROI = \frac{(Gains - Costs)}{Costs}$$

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ROI Analyses

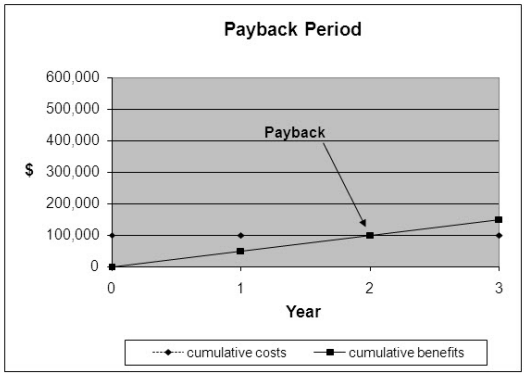
- **ROI** is the result of subtracting the project costs from the benefits and then dividing by the costs.
- For example, if you invest $100 today and next year your investment is worth $110, your ROI is ($110 – 100)/100, or 0.10 (10 percent)
- Note that the ROI is always a percentage, and the higher the ROI, the better
- Many organizations have a **required rate of return** for projects—the minimum acceptable rate of return on an investment
- You can find the **internal rate of return (IRR)** by finding what discount rate results in an NPV of zero for the project

Payback Analysis

- **Payback period** is the amount of time it will take to recoup—in the form of net cash inflows—the total dollars invested in a project
- Payback analysis determines how much time will lapse before accrued benefits overtake accrued and continuing costs
- Payback occurs in the year when the cumulative benefits minus costs reach zero
- The shorter the payback period, the better

Charting the Payback Period

Year	Costs	Benefits	Cum Costs	Cum Benefits	Cum Cash Inflows
0	100,000	0	100,000	0	-100,000
1	0	50,000	100,000	50,000	-50,000
2	0	50,000	100,000	100,000	0
3	0	50,000	100,000	150,000	50,000



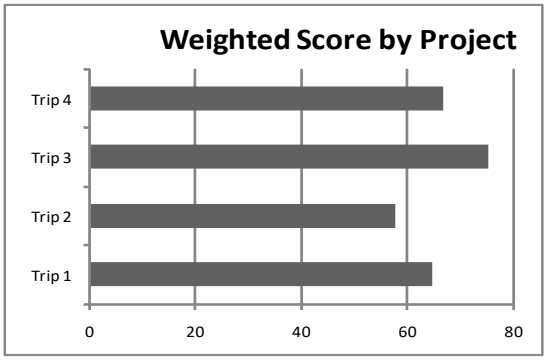
Note: A template file charting the payback period is provided on the companion Web site for the course textbook, as well as one for calculating NPV, ROI, and payback for a project (called business case financials).

Weighted Scoring Models

- A **weighted scoring model** is a tool that provides a systematic process for selecting projects based on multiple criteria
- To create a weighted scoring model:
  - Identify criteria important to the project selection process
  - Assign a weight to each criterion (so they add up to 100 percent)
  - Assign numerical scores to each criterion for each project
  - Calculate the weighted scores by multiplying the weight for each criterion by its score and adding the resulting values

A Sample Weighted Scoring Model

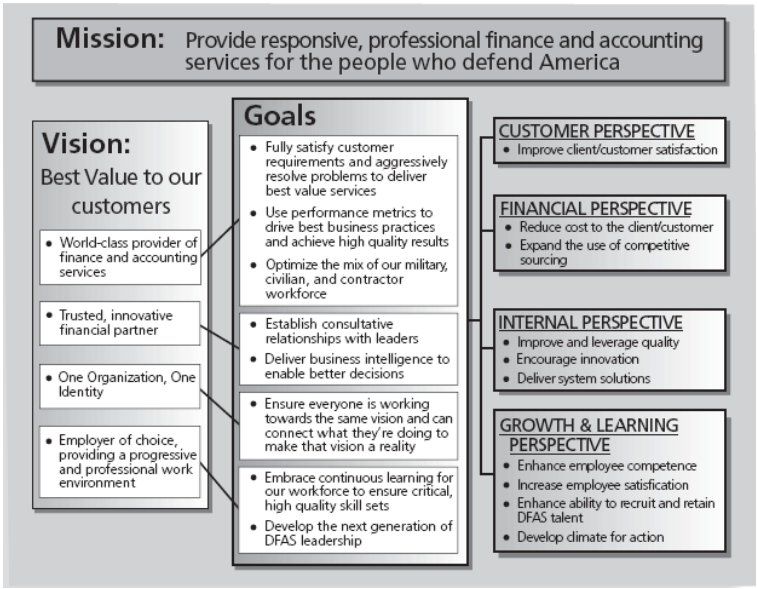
Criteria	Weight	Trip 1	Trip 2	Trip 3	Trip 4
Total cost of the trip	25%	60	80	90	20
Probability of good weather	30%	80	60	90	70
Fun activities nearby	15%	70	30	50	90
Recommendations	30%	50	50	60	90
Weighted Project Scores	**100%**	**64.5**	**57.5**	**75**	**66.5**



A Balanced Scorecard implementation

- Dr. Robert Kaplan and Dr. David Norton developed another approach to help select and manage projects that align with business strategy.
- A balanced scorecard is a methodology that converts an organization's value drivers—such as customer service, innovation, operational efficiency, and financial performance—to a series of defined metrics.
- Visit www.balancedscorecard.org for more information on using this approach to select projects.

A Balanced Scorecard Example



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