Chapter 4

Feasibility Analysis

Feasibility Analysis

Feasibility – the measure of how beneficial or practical an information system will be to an organization.

Feasibility analysis – the process by which feasibility is measured.

Creeping Commitment – an approach to feasibility that proposes that feasibility should be measured throughout the life cycle.

Feasibility Checkpoints

- Systems Analysis — Scope Definition
- Systems Analysis — Problem Analysis
- Systems Design — Decision Analysis

Four Tests For Feasibility

Operational feasibility – a measure of how well a solution will work or be accepted in an organization.

Usability analysis – a test of the system's user interfaces.

Technical feasibility – a measure of the practicality of a technical solution and the availability of technical resources and expertise.

Schedule feasibility – a measure of how reasonable the project timetable is.

Economic feasibility - a measure of the cost-effectiveness of a project or solution.

Cost-Benefit Analysis Techniques

Costs:

- Development costs are one time costs that will not recur after the project has been completed.
- Operating costs are costs that tend to recur throughout the lifetime of the system. Such costs can be classified as:
  - Fixed costs — occur at regular intervals but at relatively fixed rates.
  - Variable costs — occur in proportion to some usage factor.

Benefits:

- Tangible benefits are those that can be easily quantified.
- Intangible benefits are those benefits believed to be difficult or impossible to quantify.

Costs for a Proposed Systems Solution

Estimated Costs for Client-Server System Alternative

DEVELOPMENT COSTS

Personnel:

2	Systems Analysts (400 hours/ea $50.00/hr)	$40,000
4	Programmer/Analysts (250 hours/ea $35.00/hr)	$35,000
1	GUI Designer (200 hours/ea $40.00/hr)	$8,000
1	Telecommunications Specialist (50 hours/ea $50.00/hr)	$2,500
1	System Architect (100 hours/ea $50.00/hr)	$5,000
1	Database Specialist (15 hours/ea $45.00/hr)	$675
1	System Librarian (250 hours/ea $15.00/hr)	$3,750

Expenses:

4	Smalltalk training registration ($3,500.00/student)	$14,000

New Hardware & Software:

1	Development Server	$18,700
1	Server software (operating system, misc.)	$1,500
1	DBMS server software	$7,500
7	DBMS client software ($950.00 per client)	$6,650

Total Development Costs:	$143,275

PROJECTED ANNUAL OPERATING COSTS

Personnel:

2	Programmer/Analysts (125 hours/ea $35.00/hr)	$8,750
1	System Librarian (20 hours/ea $15.00/hr)	$300

Expenses:

1	Maintenance Agreement for server	$995
1	Maintenance Agreement for server DBMS software	$525
	Preprinted forms (15,000/year @ .22/form)	$3,300

Total Projected Annual Costs:	**$13,870**

Three Popular Techniques to Assess Economic Feasibility

- Net Present Value
- Payback Analysis
- Return On Investment

The **Time Value of Money** is a concept that should be applied to each technique. The time value of money recognizes that a dollar today is worth more than a dollar one year from now.

Net Present Value (NPV) Analysis

Net Present Value (NPV) – an analysis technique that compares the annual discounted costs and benefits of alternative solutions.

Present Value Formula

Present Value – the current value of a dollar at any time in the future.

Discount rate (factor) – a percentage similar to interest rates that you earn on your savings.

In most cases the discount rate for a business is the **opportunity cost** of being able to invest money in other projects or investments

Cost and Benefits Formulas

$$Present\ Value\ (n) = \frac{1}{(1 + Discount\ Rate)^n}\ where\ n\ is\ the\ number\ of\ years$$

$$Present\ Value\ Cost\ (n) = (Development\ Cost + Operation\ Cost) * PresentValue(n)$$

$$Cumulative\ Cost\ (n) = \sum_{i=0}^{n} Present\ Value\ Cost(i)$$

$$Present\ Value\ Benefit\ (n) = Annual\ Benefit * Present\ Value\ (n)$$

$$Cumulative\ Benefits\ (n) = \sum_{i=0}^{n} Present\ Value\ Benefits(i)$$

$$Cumulative\ Lifetime\ Adjusted\ (n) = Cumulative\ Cost\ (n) + Cumulative\ Benefits\ (n)$$

Example

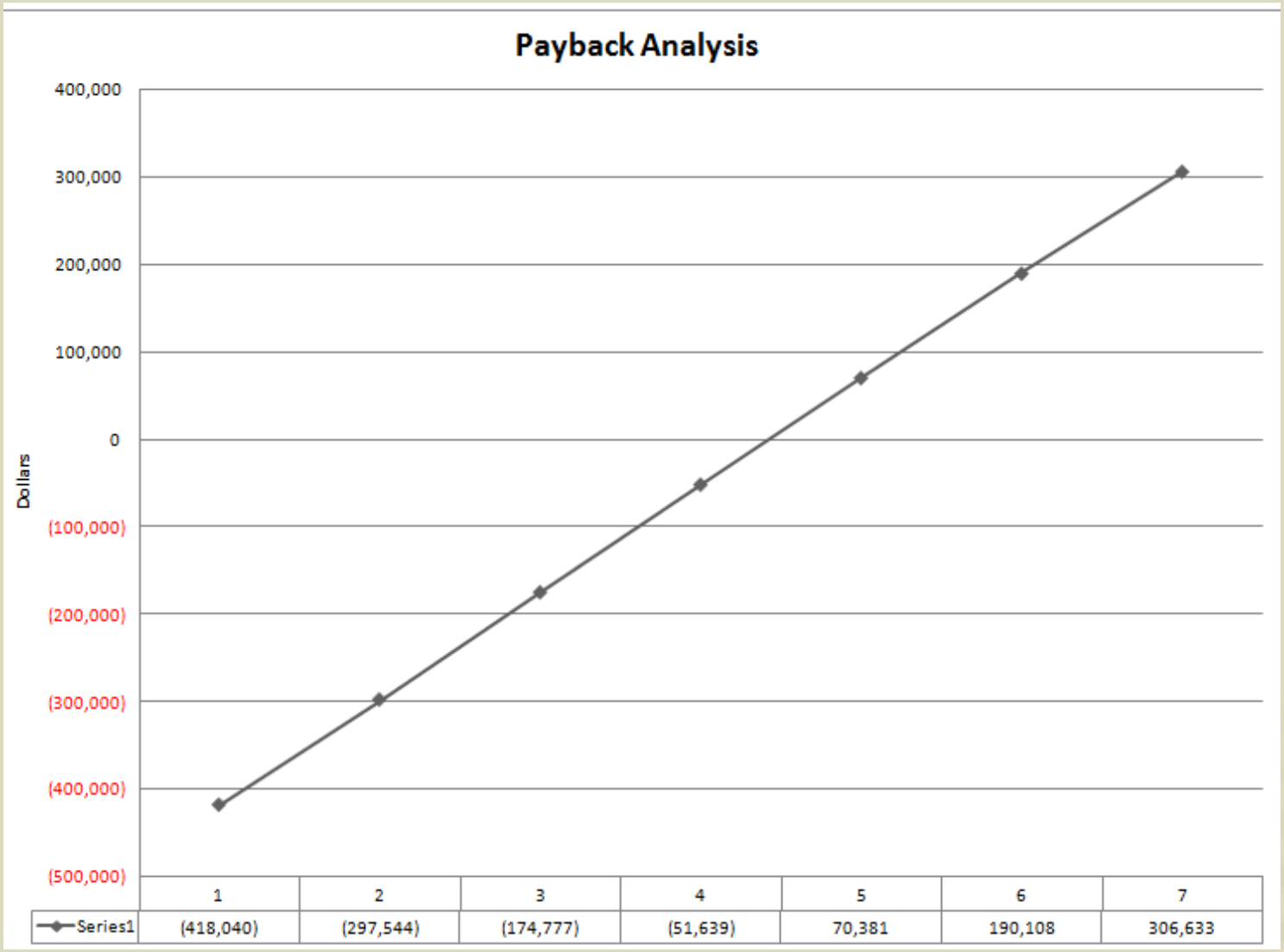
	A	B	C	D	E	F	G	H
1		Year						
2	**Cash Flow Description**	**0**	**1**	**2**	**3**	**4**	**5**	**6**
3	**Development Cost ($):**	(418,040)	0	0	0	0	0	0
4	**Operation & Maintenance Cost ($):**	0	(15,045)	(16,000)	(17,000)	(18,000)	(19,000)	(20,000)
5								
6	**Discount Factor of 12%**	1.000	0.893	0.797	0.712	0.636	0.567	0.507
7								
8	**Present Value Adjusted Cost ($):**	(418,040)	(13,433)	(12,755)	(12,100)	(11,439)	(10,781)	(10,133)
9	**Cumulative Value Cost ($):**	(418,040)	(431,473)	(444,228)	(456,328)	(467,768)	(478,549)	(488,681)
10								
11	**Benefits Derived from Operation ($):**	0	150,000	170,000	190,000	210,000	230,000	250,000
12								
13	**Present Value Adjusted Benefits ($):**	0	133,929	135,523	135,238	133,459	130,508	126,658
14	**Cumulative Value Benefits ($):**	0	133,929	269,452	404,690	538,149	668,657	795,315
15								
16	**Cumulative (Cost + Benefits) ($):**	(418,040)	(297,544)	(174,777)	(51,639)	70,381	190,108	306,633

Payback Analysis

Payback analysis – a technique for determining if and when an investment will pay for itself.

Payback period – the period of time that will lapse before accrued benefits overtake accrued and continuing costs.

Payback Analysis for a Project



Return-on-Investment Analysis (ROI)

Return-on-Investment (ROA) analysis – a technique that compares the lifetime profitability of alternative solutions.

The ROI for a solution or project is a percentage rate that measures the relationship between the amount the business gets back from an investment and the amount invested.

Lifetime ROI = (estimated lifetime benefits – estimated lifetime costs) / estimated lifetime costs

Annual ROI = lifetime ROI / lifetime of the system