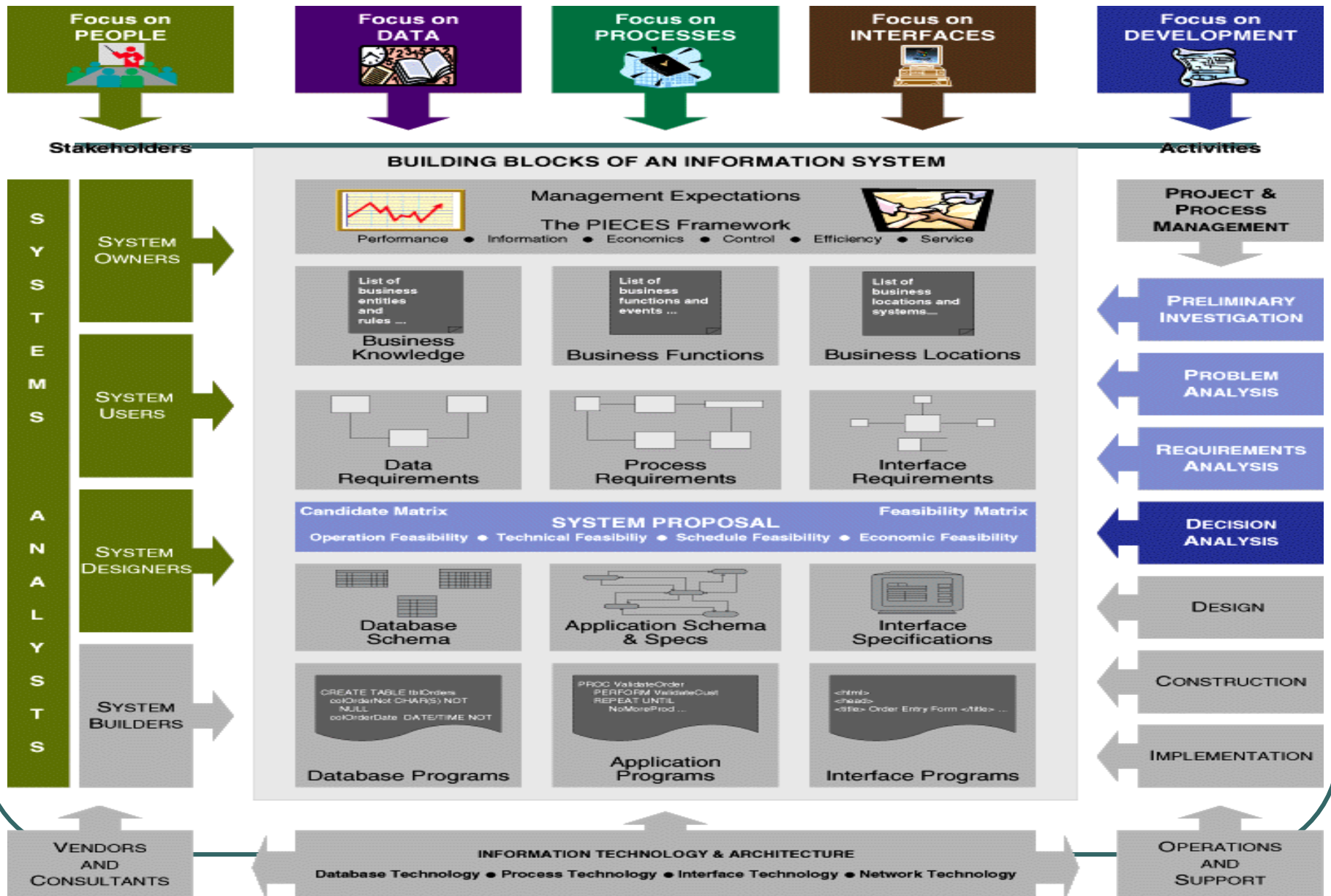


CHAPTER

9

**FEASIBILITY ANALYSIS AND
THE SYSTEM PROPOSAL**

Chapter Map



Feasibility Analysis

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

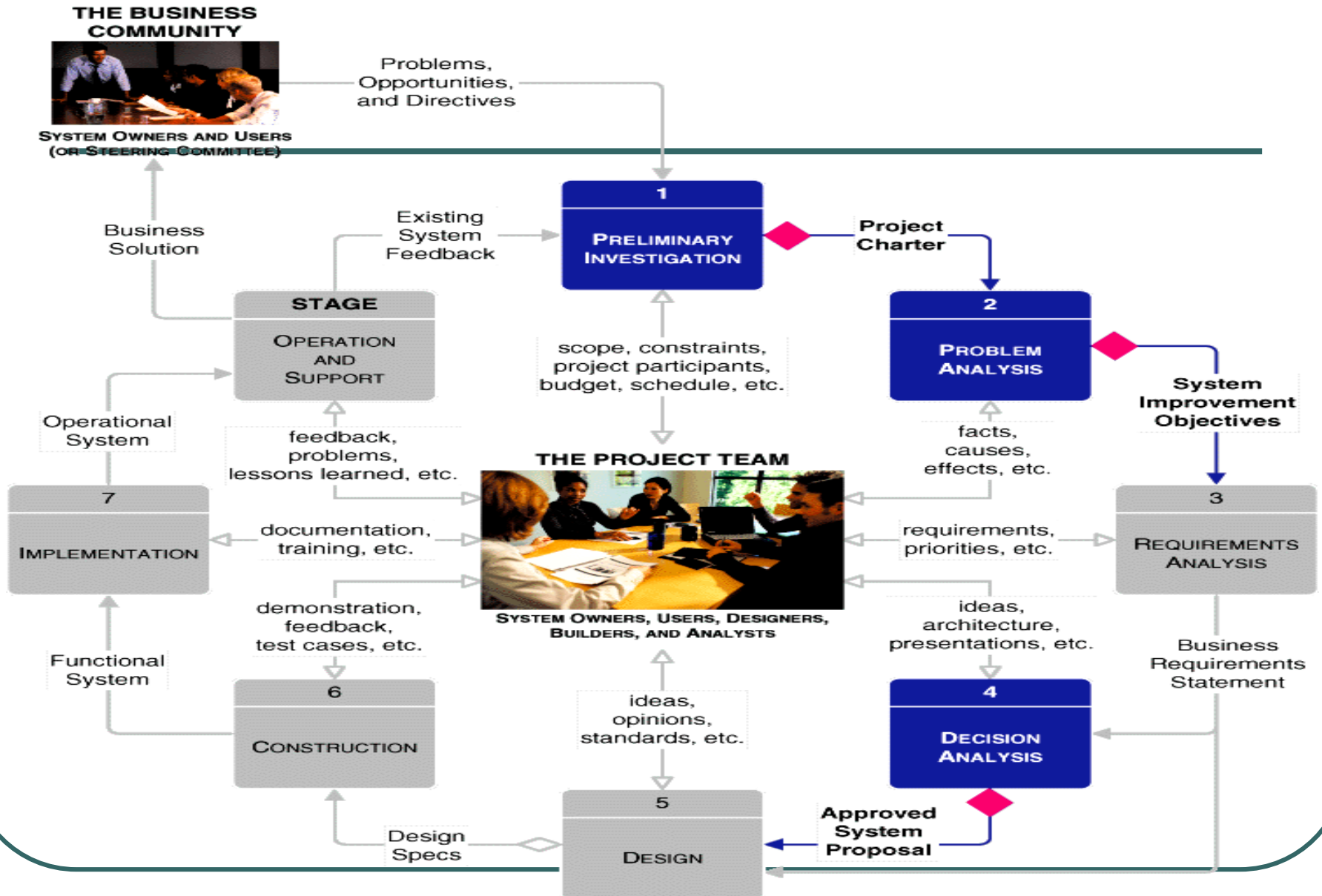
Feasibility analysis is the **process** by which feasibility is measured.

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

Feasibility Checkpoints

- Systems Analysis — Preliminary Investigation
- Systems Analysis — Problem Analysis
- Systems Design — Decision Analysis

Feasibility Checkpoints During Systems Analysis



Four Tests For Feasibility

Operational feasibility is a measure of **how well the solution will work in the organization**. It is also a measure of **how people feel** about the system/project.

Technical feasibility is a measure of the practicality of a **specific technical solution** and the availability of **technical resources and expertise**.

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

Economic feasibility is 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
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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

- Payback Analysis
- Return On Investment
- Net Present Value

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.

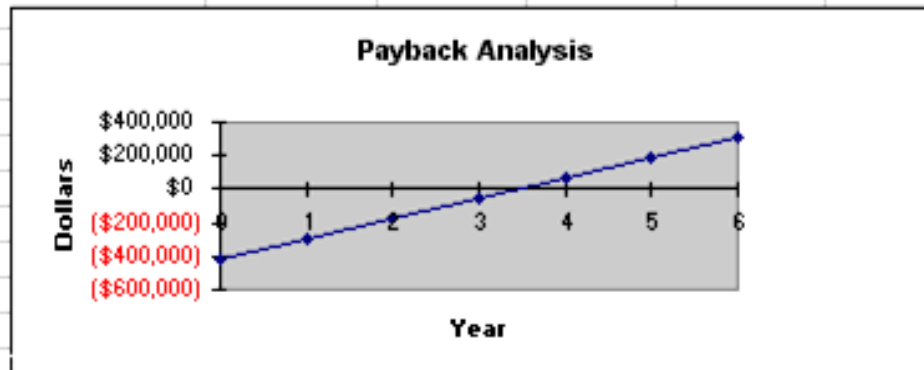
Payback Analysis

Payback analysis is a simple and popular **method** for determining if and **when an investment will pay for itself**.

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

Payback Analysis for a Project

	A	B	C	D	E	F	G	H	I
4	Cash flow description	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	
5	Development cost:	(\$418,040)							
6	Operation & maintenance cost:		(\$15,045)	(\$16,000)	(\$17,000)	(\$18,000)	(\$19,000)	(\$20,000)	
7	Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	0.507	
8	Time-adjusted costs (adjusted to present value):	(\$418,040)	(\$13,435)	(\$12,752)	(\$12,104)	(\$11,448)	(\$10,773)	(\$10,140)	
9	Cumulative time-adjusted costs over lifetime:	(\$418,040)	(\$431,475)	(\$444,227)	(\$456,331)	(\$467,779)	(\$478,552)	(\$488,692)	
10									
11	Benefits derived from operation of new system:	\$0	\$150,000	\$170,000	\$190,000	\$210,000	\$230,000	\$250,000	
12	Discount factors for 12%:	1.000	\$0.893	\$0.797	\$0.712	\$0.636	\$0.567	\$0.507	
13	Time-adjusted benefits (current of present value):	\$0	\$133,950	\$135,490	\$135,280	\$133,560	\$130,410	\$126,750	
14	Cumulative time-adjusted benefits over lifetime:	\$0	\$133,950	\$269,440	\$404,720	\$538,280	\$668,690	\$795,440	
15		0	1	2	3	4	5	6	
16	Cumulative lifetime time-adjusted costs + benefits:	(\$418,040)	(\$297,525)	(\$174,787)	(\$51,611)	\$70,501	\$190,138	\$306,748	



Return-on-Investment Analysis (ROI)

Return-on-Investment compares the lifetime profitability of alternative solutions or projects.

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.

ROI Formulas

Lifetime ROI =

$$\frac{(\text{estimated lifetime benefits} - \text{estimated lifetime costs})}{\text{estimated lifetime costs}}$$

Annual ROI =

$$\frac{\text{lifetime ROI}}{\text{lifetime of the system}}$$

Net Present Value (NPV) Analysis

	A	B	C	D	E	F	G	H	I	J
1	Net Present Value Analysis for Client-Server System Alternative									
2	(Numbers rounded to nearest \$1)									
3										
4	Cash flow description	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total	
5	Development cost:	(\$418,040)								
6	Operation & maintenance cost:		(\$15,045)	(\$16,000)	(\$17,000)	(\$18,000)	(\$19,000)	(\$20,000)		
7	Discount factors for 12%:	1.000	0.893	0.797	0.712	0.636	0.567	0.507		
8	Present value of annual costs:	(\$418,040)	(\$13,435)	(\$12,752)	(\$12,104)	(\$11,448)	(\$10,773)	(\$10,140)		
9	Total present value of lifetime costs:									(\$488,692)
10										
11	Benefits derived from operation of new	\$0	\$150,000	\$170,000	\$190,000	\$210,000	\$230,000	\$250,000		
12	Discount factors for 12%:	1.000	\$0.893	\$0.797	\$0.712	\$0.636	\$0.567	\$0.507		
13	Present value of annual benefits:	\$0	\$133,950	\$135,490	\$135,280	\$133,560	\$130,410	\$126,750		
14	Total present value of lifetime benefits:									\$795,440
15										
16	NET PRESENT VALUE OF THIS ALTERNATIVE:									\$306,748
17										

Candidate Systems Matrix

Candidate Systems Matrix documents similarities and differences between candidate systems; however, it offers **no analysis**.

	Candidate 1 Name	Candidate 2 Name	Candidate 3 Name
Interfaces			
Data			
Processes			
Geography			

Sample Candidate Systems Matrix

Characteristics	Candidate 1	Candidate 2	Candidate 3
<p>Portion of System Computerized Brief description of that portion of the system that would be computerized in this candidate.</p>	<p>COTS package Platinum Plus from Entertainment Software Solutions would be purchased and customized to satisfy Member Services required functionality.</p>	<p>Member Services and warehouse operations in relation to order fulfillment.</p>	<p>Same as candidate 2.</p>
<p>Benefits Brief description of the business benefits that would be realized for this candidate.</p>	<p>This solution can be implemented quickly because it's a purchased solution.</p>	<p>Fully supports user required business processes for SoundStage Inc. Plus more efficient interaction with member accounts.</p>	<p>Same as candidate 2.</p>
<p>Servers and Workstations A description of the servers and workstations needed to support this candidate.</p>	<p>Technically architecture dictates Pentium III, MS Windows 2000 class servers and workstations (clients).</p>	<p>Same as candidate 1.</p>	<p>Same as candidate 1.</p>
<p>Software Tools Needed Software tools needed to design and build the candidate (e.g., database management system, emulators, operating systems, languages, etc.). Not generally applicable if applications software packages are to be purchased.</p>	<p>MS Visual C++ and MS Access for customization of package to provide report writing and integration.</p>	<p>MS Visual Basic 5.0 System Architect 2001 Internet Explorer</p>	<p>MS Visual Basic 5.0 System Architect 2001 Internet Explorer</p>
			(Continued)

Sample Candidate Systems Matrix (continued)

Characteristics	Candidate 1	Candidate 2	Candidate 3
<p>Application Software A description of the software to be purchased, built, accessed, or some combination of these techniques.</p>	Package solution	Custom solution	Same as candidate 2.
<p>Method of Data Processing Generally some combination of: on-line, batch, deferred batch, remote batch, and real-time.</p>	Client/Server	Same as candidate 1.	Same as candidate 1.
<p>Output Devices and Implications A description of output devices that would be used, special output requirements, (e.g., network, preprinted forms, etc.), and output considerations (e.g., timing constraints)</p>	<p>(2) HP4MV department laser printers (2) HP5SI LAN laser printers</p>	<p>(2) HP4MV department laser printers. (2) HP5SI LAN laser printers (1) PRINTRONIX bar-code printer (includes software & drivers)</p> <p>Web pages must be designed to VGA resolution. All internal screens will be designed for SVGA resolution.</p>	Same as candidate 2.

(Continued)

Sample Candidate Systems Matrix (concluded)

Characteristics	Candidate 1	Candidate 2	Candidate 3
<p>Input devices and Implications A description of input methods to be used, input devices (e.g., keyboard, mouse, etc.), special input requirements (e.g., new or revised forms from which data would be input), and input considerations (e.g., timing of actual inputs).</p>	<p>Keyboard & mouse.</p>	<p>Apple “Quick Take” digital camera and software (15) PSC Quickscan laser bar-code scanners (1) HP Scanjet 4C Flatbed Scanner Keyboard and mouse</p>	<p>Same as candidate 2.</p>
<p>Storage Devices and Implications Brief description of what data would be stored, what data would be accessed from existing stores, what storage media would be used, how much storage capacity would be needed, and how data would be organized.</p>	<p>MS SQL Server DBMS with 1000GB arrayed capability.</p>	<p>Same as candidate 1.</p>	<p>Same as candidate 1.</p>

Feasibility Analysis Matrix

Feasibility Analysis Matrix is intended to complement the candidate systems matrix with an **analysis and ranking** of the candidate systems.

	Candidate 1 Name	Candidate 2 Name	Candidate 3 Name
Description			
Operational Feasibility			
Technical Feasibility			
Schedule Feasibility			
Economic Feasibility			
Ranking			

Sample Feasibility Analysis Matrix

Feasibility Criteria	Wt.	Candidate 1	Candidate 2	Candidate 3
<p>Operational Feasibility</p> <p>Functionality. A description of to what degree the candidate would benefit the organization and how well the system would work.</p> <p>Political. A description of how well received this solution would be from both user management, user, and organization perspective.</p>	30%	Only supports Member Services requirements and current business processes would have to be modified to take advantage of software functionality.	Fully supports user required functionality.	Same as candidate 2.
		Score: 60	Score: 100	Score: 100
<p>Technical Feasibility</p> <p>Technology. An assessment of the maturity, availability (or ability to acquire), and desirability of the computer technology needed to support this candidate.</p> <p>Expertise. An assessment of the technical expertise needed to develop, operate, and maintain the candidate system.</p>	30%	<p>Current production release of Platinum Plus package is version 1.0 and has only been on the market for 6 weeks. Maturity of product is a risk and company charges an additional monthly fee for technical support.</p> <p>Required to hire or train C++ expertise to perform modifications for integration requirements.</p>	<p>Although current technical staff has only Powerbuilder experience, the senior analysts who saw the MS Visual Basic demonstration and presentation have agreed the transition will be simple and finding experienced VB programmers will be easier than finding Powerbuilder programmers and at a much cheaper cost. MS Visual Basic is a mature technology based on version number.</p>	<p>Although current technical staff is comfortable with Powerbuilder, management is concerned with recent acquisition of Powerbuilder by Sybase Inc. MS SQL Server is a current company standard and competes with SYBASE in the client/server DBMS market. Because of this we have no guarantee future versions of Powerbuilder will "play well" with out current SQL Server.</p>
		Score: 50	Score: 95	Score: 60
<p>Economic Feasibility</p> <p>Cost to develop:</p> <p>Payback period (discounted):</p> <p>Net present value:</p> <p>Detailed calculations:</p>	30%	<p>Approximately \$350,000.</p> <p>Approximately 4.5 years.</p> <p>Approximately \$210,000.</p> <p>See Attachment A.</p>	<p>Approximately \$418,040.</p> <p>Approximately 3.5 years.</p> <p>Approximately \$306,748.</p> <p>See Attachment A.</p>	<p>Approximately \$400,000.</p> <p>Approximately 3.3 years.</p> <p>Approximately \$325,500.</p> <p>See Attachment A.</p>
		Score: 60	Score: 85	Score: 90
<p>Schedule Feasibility</p> <p>An assessment of how long the solution will take to design and implement.</p>	10%	Less than 3 months.	9-12 months.	9-12 months.
		Score: 95	Score: 80	Score: 85
Ranking	100%	60.5	92	85

Summary

- Identify feasibility checkpoints in the systems life cycle.
- Identify alternative system solutions.
- Define and describe four types of feasibility and their respective criteria.
- Perform various cost-benefit analyses using time-adjusted costs and benefits.
- Write suitable system proposal reports for different audiences.
- Plan for a formal presentation to system owners and users.