Feasibility Analysis

Key Ideas

- Projects initiated to create **business value** from using **information technology**.
- Business needs:
  - Lower cost/Increase revenue
  - Improve customer service
  - Use latest/emerging technologies
  - …

Key Ideas

- A *system request* presents
  - a brief summary of a business need
  - explains how a system that supports the need will create business value.
- The *project sponsor* is a key person
  - Recognize business need
  - Understand business value
  - Adoption of new IT
  - Want system to succeed
- The *approval committee*
  - reviews proposals from various groups and units
  - Approve/decline/suspend projects

IDENTIFYING BUSINESS VALUE

Business value

- **Tangible value** can be quantified and measured easily, e.g.
  - 2% reduction in operating costs
  - 5% increase in sales
- **Intangible value** – system provides important but hard-to-measure benefits, e.g.
  - improved customer service
  - better competitive position

System Request

- Describes business reasons for building a system – the **business value**
- Project sponsor prepares the document
- Approval committee reviews and judges the system request

System Request

- Lists key elements of the project
  - Project sponsor
  - Business need
  - Business requirements
  - Business value
  - Special issues or constraints

Element	Description	Examples
Project Sponsor	The person who initiates the project and who serves as the primary point of contact for the project on the business side	Several members of the finance department Vice president of marketing IT manager Steering committee CIO CEO
Business Need	The business-related reason for initiating the system	Increase sales Improve market share Improve access to information Improve customer service Decrease product defects Streamline supply acquisition processes
Business Requirements	The business capabilities that the system will provide	Provide online access to information Capture customer demographic information Include product search capabilities Produce management reports Include online user support
Business Value	The benefits that the system will create for the organization	3% increase in sales 1% increase in market share Reduction in headcount by 5*FTEs $200,000 cost savings from decreased supply costs $150,000 savings from removal of existing system
Special Issues or Constraints	Issues that are relevant to the implementation of the system that need to be known by the approval committee	Government-mandated deadline for May 30 System needed in time for the Christmas holiday season Top-level security clearance needed by project team to work with data

System Request—Digital Music Download Project

Project Sponsor: Carly Edwards, Assistant Vice President, Marketing

Business Need: This project has been initiated to increase sales by creating the capability of selling digital music downloads to customers through kiosks in our stores, and over the Internet using our website.

Business Requirements: Using the Web or in-store kiosks, customers will be able to search for and purchase digital music downloads. The specific functionality that the system should have includes the following:

- Search for music in our digital music archive.
- Listen to music samples.
- Purchase individual downloads at a fixed fee per download.
- Establish a customer subscription account permitting unlimited downloads for a monthly fee.
- Purchase music download gift cards.

Business Value: We expect that Tune Source will increase sales by enabling existing customers to purchase specific digital music tracks and by reaching new customers who are interested in our unique archive of rare and hard-to-find music. We expect to gain a new revenue stream from customer subscriptions to our download services. We expect some increase in cross-selling, as customers who have downloaded a track or two of a CD decide to purchase the entire CD in a store or through our website. We also expect a new revenue stream from the sale of music download gift cards.

Conservative estimates of tangible value to the company include the following:

- $757,500 in sales from individual music downloads
- $950,000 in sales from customer subscriptions
- $205,000 in additional in-store or website CD sales
- $153,000 in sales from music download gift cards

Special Issues or Constraints:

- The marketing department views this as a strategic system. The ability to offer digital music downloads is critical in order to remain competitive in our market niche. Our music archive of rare and hard-to-find music is an asset that is currently underutilized.

Umm… Spotify?

System Request– Student Record Systems (SRS) Project

Project sponsor: Matt Ferry

Business Need:

Due to increasing registration (expected 5% per year) and a co-related increase in workload with the current manual system, a new system should be created. This will enable us to streamline the registration process, allow students to register for classes themselves, and allow employees to access the system from any computer that has access to an internet connection.

Business Requirements:

- The functionality that the system should have is listed below:
- Maintain records for students enrolled in school
- Maintain courses offered by the school
- Maintain classes offered of the available courses (online and face-to-face)
- Maintain student grades for completed classes
- Allow for Student Self-registration
- Allow staff to work from any location that has an Internet connection and web browser

Business Value:

Conservative estimates of tangible value to the company includes:

- 90% reduction in registration time. (600 hours or $12,000 instead of 6000 or $120,000)
- 10% increase in staff productivity (Saving $50,000) Improved staff morale and student interaction

Special Issues or Constraints:

- Security issues must be addressed, as students will have access to school files.
- Due to rapid increase in enrollment, this project needs to be finished within 1 year

Your Turn

- If you were building a web-based system for course enrollment --
  - What would be the functionality?
  - What would be the expected value?
  - What special issues or constraints would you foresee?

FEASIBILITY ANALYSIS

Key Ideas

- **Feasibility analysis** is used to aid in the decision of whether or not to proceed with the IS project.
- Also identifies project **risks**
- Can be revised throughout SDLC

Feasibility Analysis

- Detailing Expected Costs and Benefits
  - **Technical** feasibility
  - **Economic** feasibility
  - **Organizational** feasibility

Technical Feasibility: *Can* We Build It?

- Familiarity with application
  - Knowledge of business domain
- Familiarity with technology
  - Extension of existing firm technologies
- Project size
  - Number of people, time, and features
- Compatibility
  - Ease of integrating the system with the company's existing technology

Economic Feasibility
Should We Build It?

- Perform cost benefit analysis
  - Identify costs and benefits
  - Assign values
  - Calculate cash flow and ROI
- Development costs
- Annual operational costs
- Annual benefits
- Intangible costs and benefit

Economic Feasibility Steps

1. Identify Costs and Benefits	List the tangible costs and benefits for the project. Include both one-time and recurring costs.
2. Assign Values to Costs and Benefits	Work with business users and IT professionals to create numbers for each of the costs and benefits. Even intangibles should be valued if at all possible.
3. Determine Cash Flow	Forecast what the costs and benefits will be over a certain period, usually, three to five years. Apply a growth rate to the values, if necessary.
4. Assess Project's Economic Value	Evaluate the project's expected returns in comparison to its costs. Use one or more of the following evaluation techniques:
• **Return on Investment (ROI)**	Calculate the rate of return earned on the money invested in the project, using the ROI formula.
• **Break-Even Point (BEP)**	Find the year in which the cumulative project benefits exceed cumulative project costs. Apply the breakeven formula, using figures for that year. This calculation measures how long it will take for the system to produce benefits that cover its costs.
• **Net Present Value (NPV)**	Restate all costs and benefits in today's dollar terms (present value), using an appropriate discount rate. Determine whether the total present value of benefits is greater than or less than the total present value of costs.

Example Cost & Benefits

Development Costs	Operational Costs
Development Team Salaries	Software Upgrades
Consultant Fees	Software Licensing Fees
Development Training	Hardware Repairs
Hardware and Software	Hardware Upgrades
Vendor Installation	Operational Team Salaries
Office Space and Equipment	Communications Charges
Data Conversion Costs	User Training

Tangible Benefits	Intangible Benefits
Increased Sales	Increased Market Share
Reductions in Staff	Increased Brand Recognition
Reductions in Inventory	Higher Quality Products
Reductions in IT Costs	Improved Customer Service
Better Supplier Prices	Better Supplier Relations

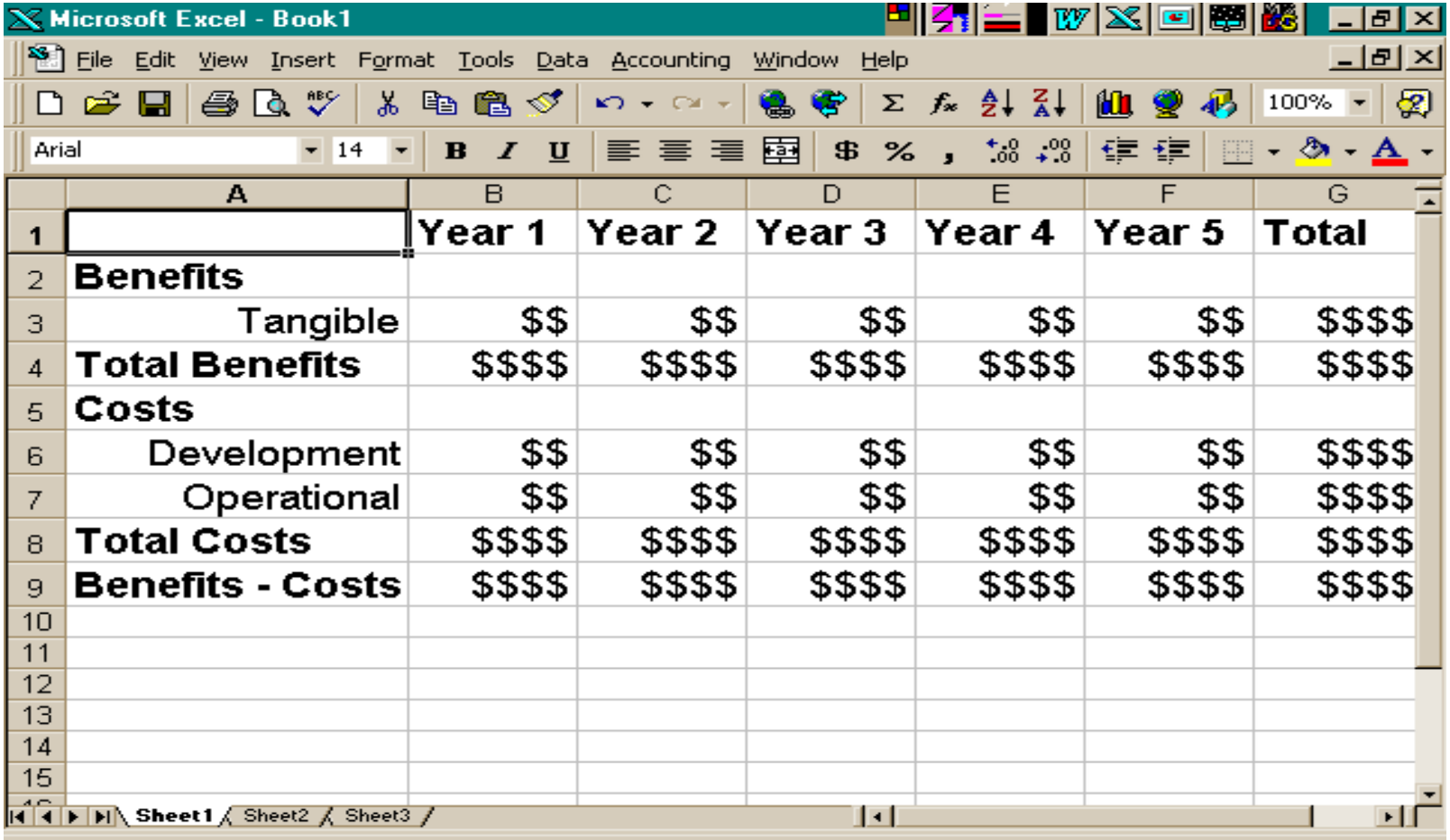
Assign Values

Benefits[a]	
Increased sales	500,000
Improved customer service[b]	70,000
Reduced inventory costs	68,000
Total benefits	**638,000**
Development costs	
2 servers @ $125,000	250,000
Printer	100,000
Software licenses	34,825
Server software	10,945
Development labor	1,236,525
Total development costs	**1,632,295**
Operational costs	
Hardware	54,000
Software	20,000
Operational labor	111,788
Total operational costs	**185,788**
Total costs	**1,818,083**

[a] An important yet intangible benefit will be the ability to offer services that our competitors currently offer.

[b] Customer service numbers have been based on reduced costs for customer complaint phone calls.

Cash Flow Method for Cost Benefit Analysis



	A	B	C	D	E	F	G
1		Year 1	Year 2	Year 3	Year 4	Year 5	Total
2	**Benefits**						
3	Tangible	$$	$$	$$	$$	$$	$$$$
4	**Total Benefits**	$$$$	$$$$	$$$$	$$$$	$$$$	$$$$
5	**Costs**						
6	Development	$$	$$	$$	$$	$$	$$$$
7	Operational	$$	$$	$$	$$	$$	$$$$
8	**Total Costs**	$$$$	$$$$	$$$$	$$$$	$$$$	$$$$
9	**Benefits - Costs**	$$$$	$$$$	$$$$	$$$$	$$$$	$$$$
10							
11							
12							
13							
14							
15							

Cost-Benefit Analysis

	2012	2013	2014	2015	2016	Total
Benefits						
Increased sales		500,000	530,000	561,800	595,508	2,187,308
Reduction in customer complaint calls[a]		70,000	70,000	70,000	70,000	280,000
Reduced inventory costs		68,000	68,000	68,000	68,000	272,000
Total Benefits[b]		**638,000**	**668,000**	**699,800**	**733,508**	**2,739,308**
Development Costs						
2 servers @ $125,000	250,000	0	0	0	0	250,000
Printer	100,000	0	0	0	0	100,000
Software licenses	34,825	0	0	0	0	34,825
Server software	10,945	0	0	0	0	10,945
Development labor	1,236,525	0	0	0	0	1,236,525
Total Development Costs	**1,632,295**	**0**	**0**	**0**	**0**	**1,632,295**
Operational Costs						
Hardware		50,000	50,000	50,000	50,000	200,000
Software		20,000	20,000	20,000	20,000	80,000
Operational labor		115,000	119,600	124,384	129,359	488,343
Total Operational Costs		**185,000**	**189,600**	**194,384**	**199,359**	**768,343**
Total Costs	**1,632,295**	**185,000**	**189,600**	**194,384**	**199,359**	**2,400,638**
Total Benefits – Total Costs	**(1,632,295)**	**453,000**	**478,400**	**505,416**	**534,149**	**338,670**
Cumulative Net Cash Flow	**(1,632,295)**	**(1,179,295)**	**(700,895)**	**(195,479)**	**338,670**	
Return on Investment (ROI)	**14.1%**	**(338,670/2,400,638)**				
Break-even Point	**3.37 years**	**(3 years of negative cumulative cash flow + [534,149 – 338,670]/534,149 = .37)**				

[a] Customer service values are based on reduced costs of handling customer complaint phone calls.

[b] An important yet intangible benefit will be the ability to offer services that our competitors currently offer.

Present Value Calculation

PRESENT VALUE EQUALS
Cash flow amount
Divided by
$(1 + \text{interest rate})^n$ Where "n" equals the number of periods

$100 received in 3 years with a required rate of return of 10% has a PV of $75.13.

$$PV = \frac{100}{(1 + .10)^3} = \frac{100}{1.331} = 75.13$$

Net Present Value (NPV)

The NPV is simply the difference between the total present value of the benefits and the total present value of the costs.

$$\begin{aligned} \text{NPV} &= \sum \text{PV of Total Benefits} - \sum \text{PV of Total Costs} \\ &= \$125{,}056 - \$131{,}029 = (\$5{,}973) \end{aligned}$$

30000 500000 252100

10 20 30 60

Return on Investment (ROI)

- Measures money received in return for money invested
- High ROI is desirable when benefits exceed costs
- Can be determined per year, or for entire project completion period

Return on Investment Calculation

	Year 0	Year 1	Year 2	Year 3
Total Benefits		45,000	50,000	57,000
Total Costs	100,000	10,000	12,000	16,000

Return on Investment Calculation

	Year 0	Year 1	Year 2	Year 3	Total
Total Benefits		45,000	50,000	57,000	152,000
Total Costs	100,000	10,000	12,000	16,000	138,000
Net Benefits (Total Benefits – Total Costs)	(100,000)	35,000	38,000	41,000	14,000
Cumulative Net Cash Flow	(100,000)	(65,000)	(27,000)	14,000	

$$\text{ROI} = \frac{\text{Total Benefits} - \text{Total Costs}}{\text{Total Costs}}$$

$$\text{ROI} = \frac{152{,}000 - 138{,}000}{138{,}000} = \frac{14{,}000}{138{,}000} = 10.14\%$$

Break-Even point

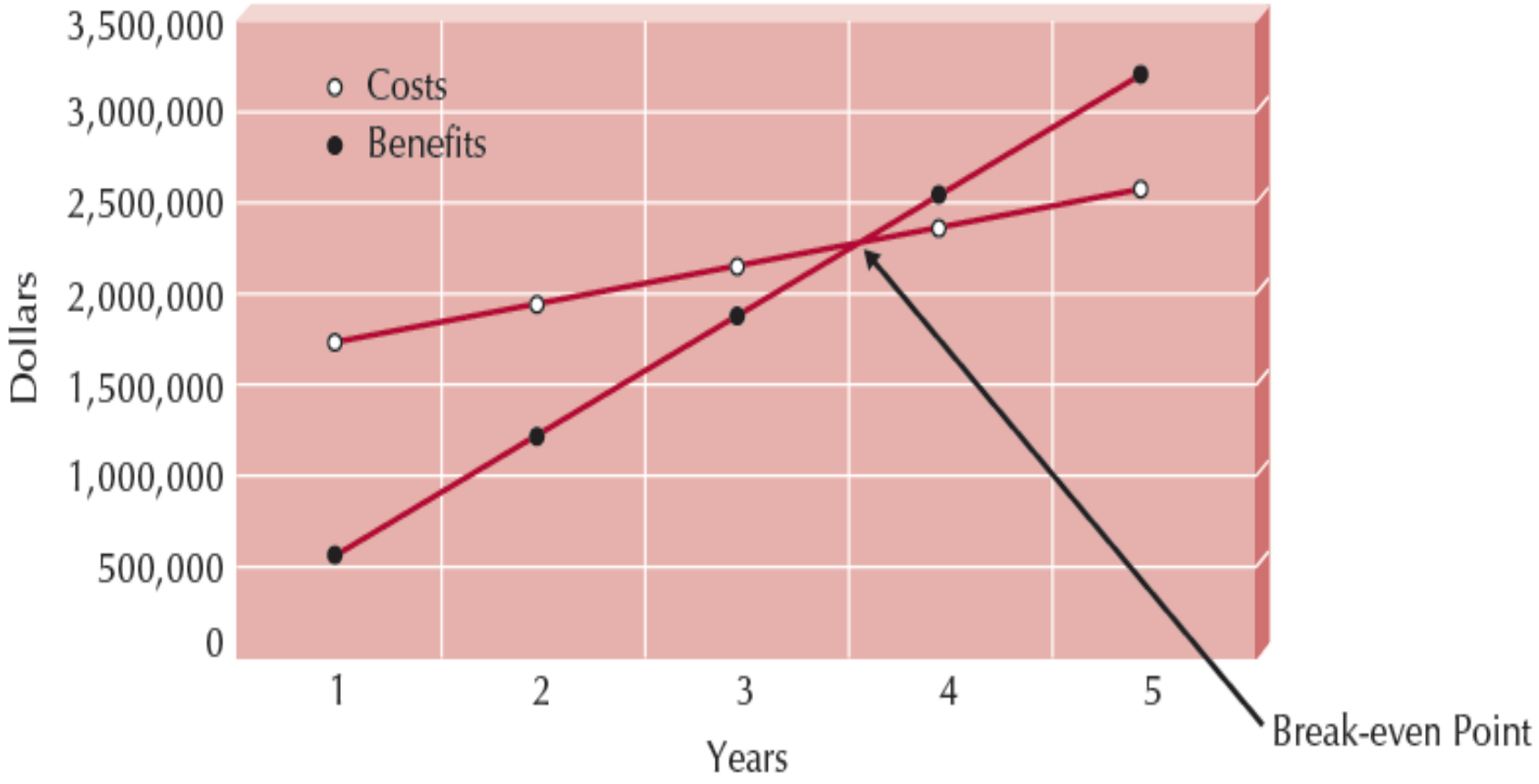
- Length of time when returns will match amount invested
- Greater time -> Greater risks
- Easier to picture graphically – plot cumulative present value of benefits and costs for each year

Break-Even point

$$\text{BEP} = \begin{array}{l}\text{Number of}\\ \text{years of}\\ \text{negative}\\ \text{cash flow}\end{array} + \frac{\text{That year's Net Cash Flow} - \text{That year's Cumulative Cash Flow}}{\text{That year's Net Cash Flow}}$$

$$\text{BEP} = 2 + \frac{41{,}000 - 14{,}000}{41{,}000} = 2 + \frac{28{,}000}{41{,}000} = 2.68 \text{ years}$$

Break-Even Graph



Formulas

Calculation	Definition	Formula
Present Value (PV)	The amount of an investment today compared to that same amount in the future, taking into account inflation and time.	$\frac{\text{Amount}}{(1 + \text{interest rate})^n}$ n = number of years in future
Net Present Value (NPV)	The present value of benefit less the present value of costs.	PV Benefits – PV Costs
Return on Investment (ROI)	The amount of revenues or cost savings results from a given investment.	$\frac{\text{Total benefits} - \text{Total costs}}{\text{Total costs}}$
Break-Even Point	The point in time at which the costs of the project equal the value it has delivered.	$\frac{\text{Yearly NPV*} - \text{Cumulative NPV}}{\text{Yearly NPV*}}$ *Use the Yearly NPV amount from the first year in which the project has a positive cash flow. Add the above amount to the year in which the project has a positive cash flow.

Organizational Feasibility

If we build it, will they come?

- Will the users accept the system?
- Will it be incorporated in the organization?
- How to asses?
  1. Check *Strategic Alignment* – fit between project and business strategy?

Organizational Feasibility

If we build it, will they come?

2. Perform *Stakeholder Analysis*

- **Stakeholder** – any person, group, or organization that can affect or will be affected by the system
- Stakeholder analysis considers
  - Project champion(s)
  - Organizational management
  - System users

Stakeholders

	Role	Techniques for improvement
Champion	A champion: • Initiates the project • Promotes the project • Allocates his or her time to project • Provides resources	• Make a presentation about the objectives of the project and the proposed benefits to those executives who will benefit directly from the system • Create a prototype of the system to demonstrate its potential value
Organizational Management	Organizational managers: • Know about the project • Budget enough money for the project • Encourage users to accept and use the system	• Make a presentation to management about the objectives of the project and the proposed benefits • Market the benefits of the system using memos and organizational newsletters • Encourage the champion to talk about the project with his or her peers
System Users	Users: • Make decisions that influence the project • Perform hands-on activities for the project • Ultimately determine whether the project is successful by using or not using the system	• Assign users official roles on the project team • Assign users specific tasks to perform with clear deadlines • Ask for feedback from users regularly (e.g., at weekly meetings)

Digital Music Download Project Executive Summary

Carly Edwards and Jason Wells created the following feasibility analysis for the Tune Source Digital Music Download Project. The System Request is attached, along with the detailed feasibility study. The highlights of the feasibility analysis are as follows:

Technical Feasibility

The Digital Music Download system is feasible technically, although there is some risk.

Tune Source's risk regarding familiarity with music download applications is moderately high.

- The Marketing Department has little experience with a subscription-based business model.
- The IT department has strong knowledge of the company's existing Web-based CD sales system, but it has not worked with music downloads or customer subscriptions.
- Numerous music download sites exist on the Internet.

Tune Source's risk regarding familiarity with the technology is moderately low.

- The IT department has knowledge of the current Web-based order entry system and the databases and Internet technology it uses.
- The IT department has no direct knowledge of the technology required to store and deliver digital music downloads; however, many of the technical issues will be the responsibility of the ISP.
- Consultants are readily available to provide help in this area.

The project size is considered medium risk.

- The project team will likely consist of 10 or fewer people.
- Business user involvement will be required.
- The project time frame is somewhat critical, since the system is needed to maintain our competitive position in the market.

The compatibility with Tune Source's existing technical infrastructure should be good.

- An Internet infrastructure is already in place at the retail stores and corporate headquarters.
- The ISP should be able to scale its services to accommodate the new Digital Music Download system.

Economic Feasibility

A cost–benefit analysis was performed; see attached spreadsheet for details (provided in Appendix 1A). Conservative estimates show that the Digital Music Download system has a good chance of significantly enhancing the company's bottom line.

ROI over 3 years: 280%
NPV over 3 years: $4,180,431
Break-even occurs after 0.17 years

Intangible Costs and Benefits
Improved customer satisfaction.
Enhanced competitive position through expansion of our brand into the music download market.

Organizational Feasibility

From an organizational perspective, this project has low risk. The top executives of the company have a strong interest in the project, and the project champion, Carly Edwards, is a respected and knowledgeable marketing executive.

The users of the system, Internet consumers and in-store kiosk users, are expected to appreciate the entry of Tune Source into the music download arena. Management at the stores may have some concern about lost CD sales; however, since customers have so many other options available for music downloads, this system may prevent our losing those customers to other digital music sources and may provide us with the opportunity to cross-sell those customers from our CD inventory.

Additional comments:

- The Marketing Department views this as a strategic system. This system will allow us to leverage our music archive and our well-established market position to establish a presence in the digital music download business. Our customers have been requesting such a capability, and we believe it will be well accepted.
- We should consider hiring a consultant with expertise in similar applications to assist with the project.
- We will need new staff to operate the system and potentially to provide customer service for subscribers and gift-card holders.

Summary

- Project initiation involves creating and assessing goals and expectations for a new system
- Identifying the business value of the new project is a key to success
- The system request describes an overview of the proposed system.
- The feasibility study is concerned with ensuring that technical, economic, and organizational benefits outweigh costs and risks