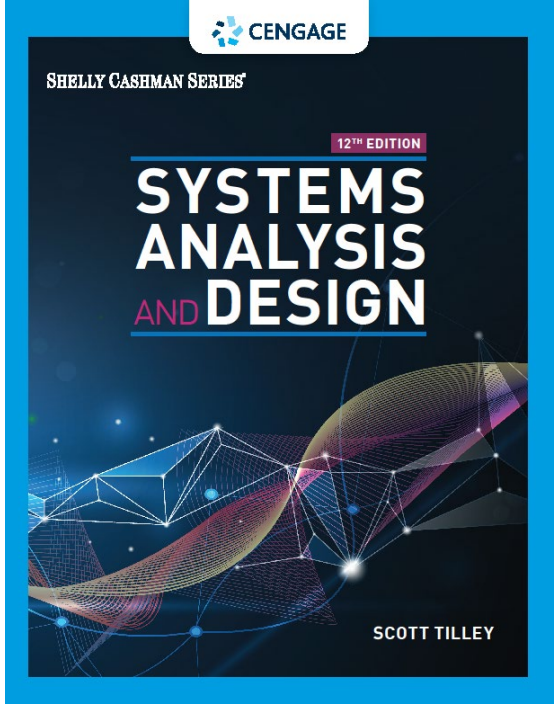
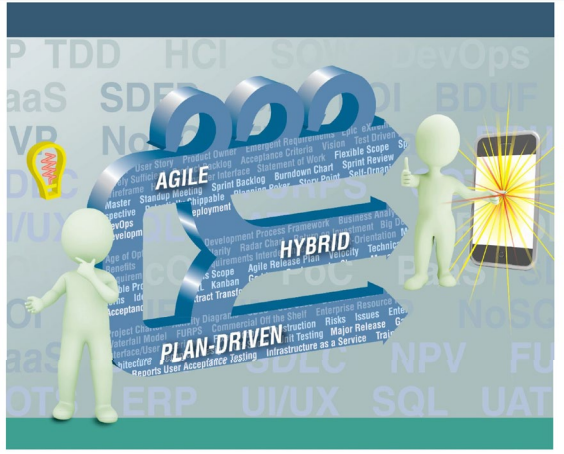




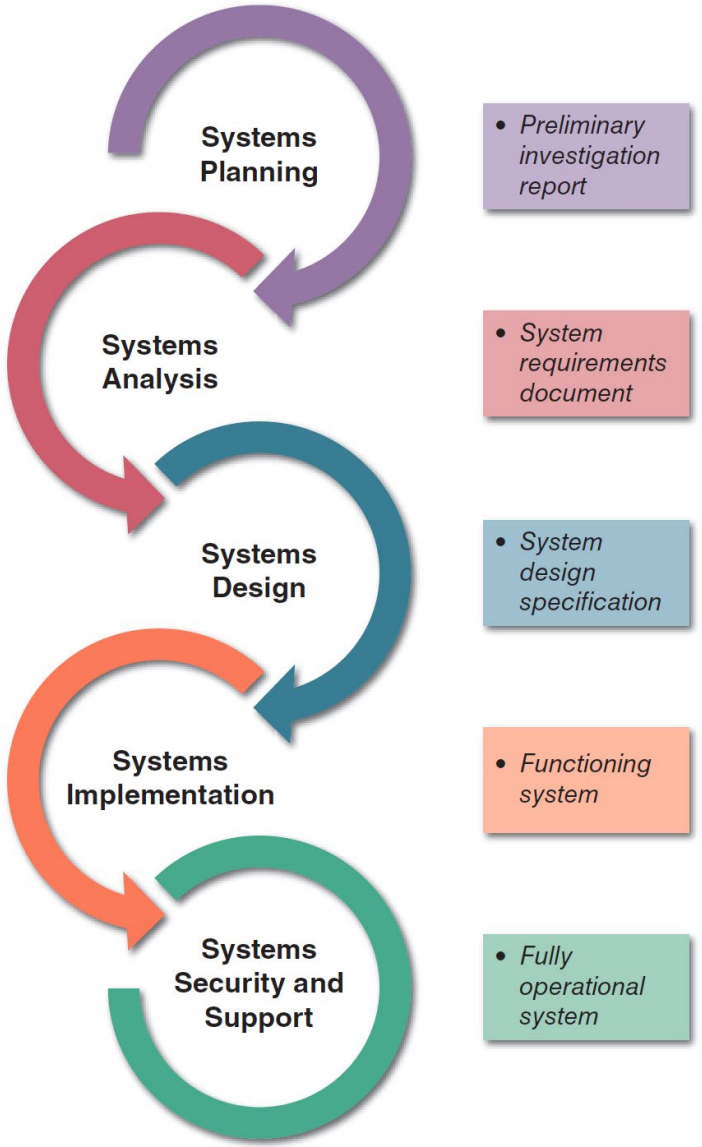
Systems Analysis & Design
in an Age of Options

Gary Spurrier | Heikki Topi

Chapter 2

Analyzing the Business Case

Systems Development Life Cycle



Learning Objectives

- Explain Strategic Planning
- Explain the concept of a business case
- Describe the factors affect project feasibility
- Define a preliminary investigation
- Perform SWOT & Cost-Benefit Analysis
- Describe how projects are prioritized

Strategic Planning (1 of 5)

- Process of identifying long-term organizational goals, strategies, and resources
  - Starts with the corporate mission statement
    - Reflects the vision, purpose, and values of the organization
    - Critical success factor: high-priority objective
- What is the purpose of the organization

Mission Statements

- https://about.google/
- https://www.coca-colacompany.com/company/purpose-and-vision
- https://www.clemson.edu/brand/positioning/mission-vision.html
- https://mission-statement.com/

Strategic Planning (2 of 5)

- SWOT analysis
  - Strengths
  - Weaknesses
  - Opportunities
  - Threats

  - Examines technical, human, and financial resources

Strategic Planning (3 of 5)

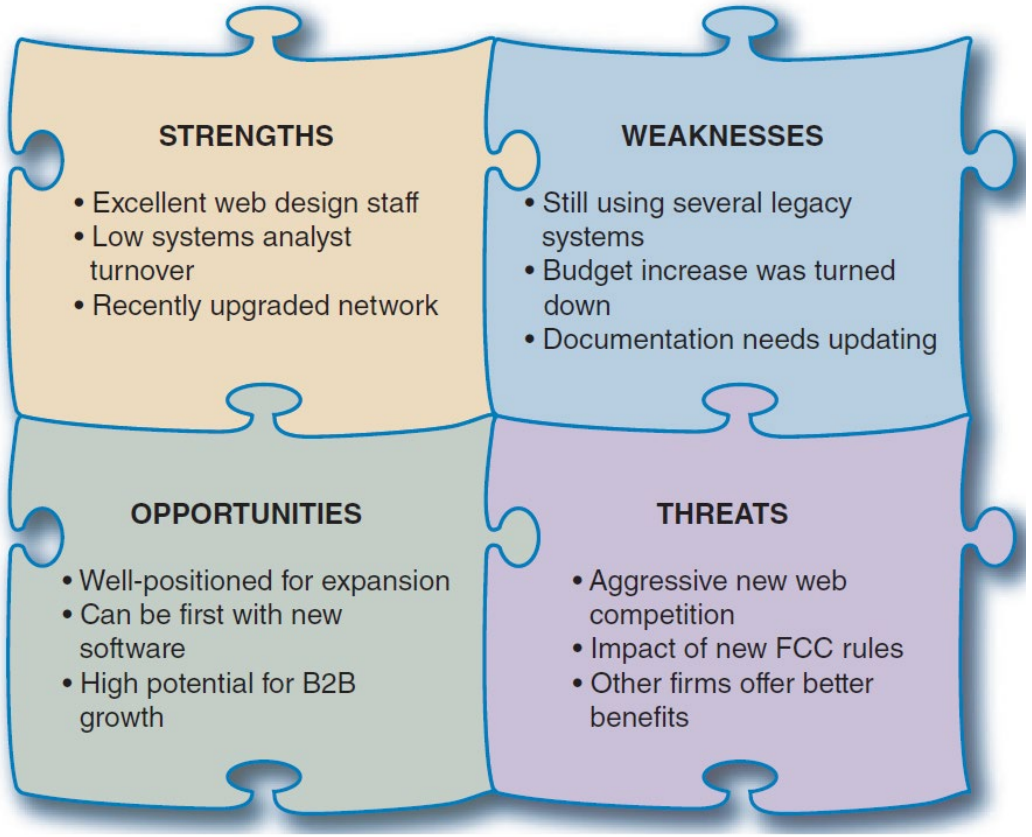


FIGURE 2-1 A SWOT analysis might produce results similar to those shown here.

Strategic Planning (4 of 5)

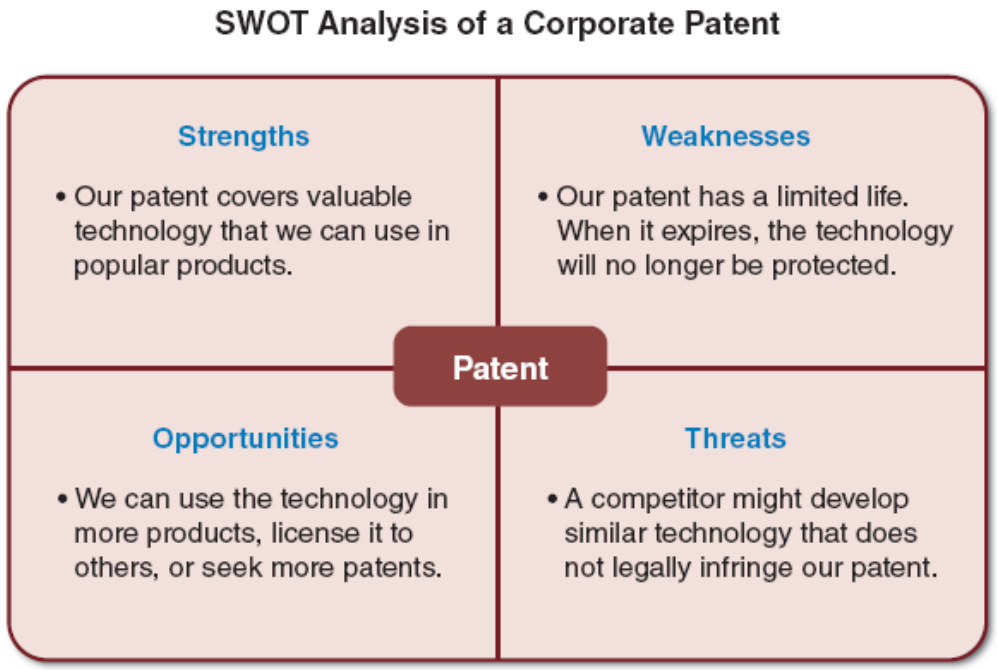


FIGURE 2-2 This SWOT analysis example focuses on a specific asset, such as a company patent.

Strategic Planning (5 of 5)

- The role of the IT department
  - Careful project planning
    - Supports overall business strategy and operational needs
    - Scope is well-defined and clearly stated
    - Goals are realistic, and tied to specific statements, assumptions, constraints, factors, and other inputs

The Business Case - 1

- Justification for a proposal
  - Comprehensive and easy to understand
    - Describe the project clearly, provide justification to proceed, and estimate financial impact
    - Can be simple or extensive
- Many questions answered
  - Why are we doing this project?
  - How much will it cost and how long will it take?
  - Are there any risks involved?
  - How will we measure success?
  - What alternatives exist?

The Business Case - 2

- Determining how the Information System can be applied within an organization to help it achieve its goals
- Three primary ways:
  - Increase top-line revenues or other key outputs
  - Increase bottom-line profits
  - Stay in business

Increasing Revenue

- Increase revenue of (non) IT products and services sold
  - Improve product/service quality
  - Add/improve features
  - Create new products or services
- Increase revenue directly via selling software
  - Licenses
  - Software as a Service fees
  - Maintenance fees
- Increase ad revenue when "giving away" the IT product

Increasing Efficiency → Improving Profits

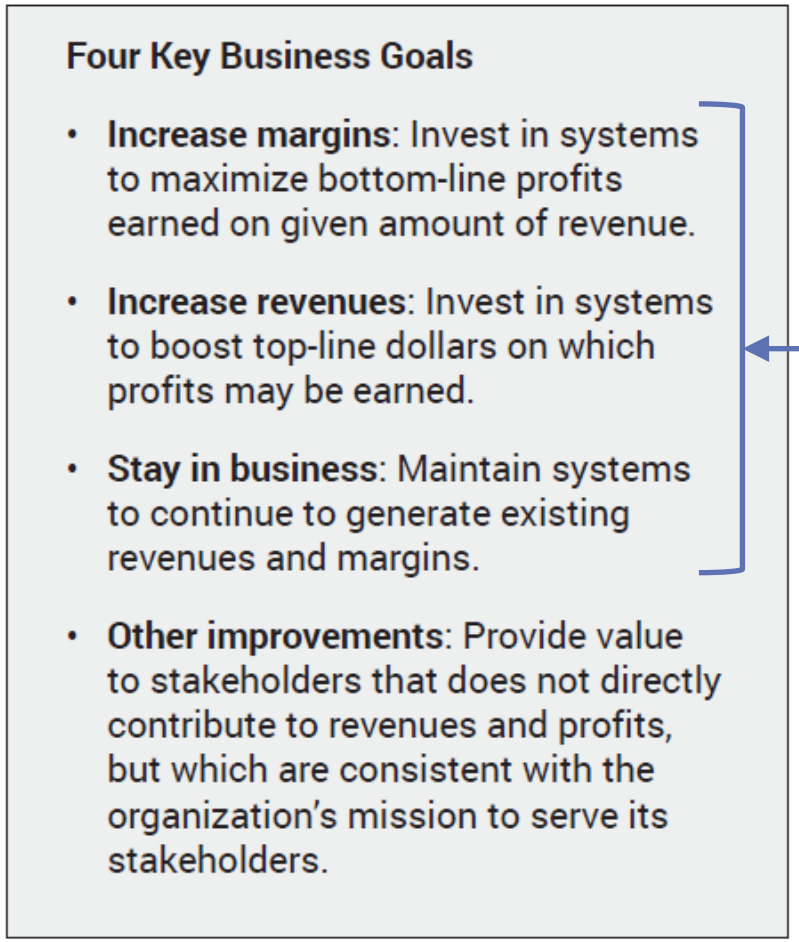
- Decrease hours required to deliver product or service
- Decrease hourly compensation costs
  (e.g., more junior, less skilled users)
- Use resources more efficiently
  - E.g., reduce raw material use by reducing waste with better planning
  - Logistics and Supply Chain Management

Staying in Business

- Ensuring regulatory compliance: For example, complying with legal audits or ADA (Americans with Disabilities Act) requirements
- Protecting privacy and security, especially for personal information and personally identifiable information
- Enabling technology current
- Increasing accessibility through architecting for reliability
- Responding to competitor actions

Monetization and Four Key Business Goals

- **Monetization:**
  - Process of finding ways to take nonmonetary assets or capabilities (read: system features) and turn them into quantifiable economic value
  - More simply: how to make money from systems features



Business Case Output

Does the project make sense in the context of the Organization's strategic vision and plan?

If NOT….we're done!

If it does….is the project feasible?

Factors Affecting Systems Projects

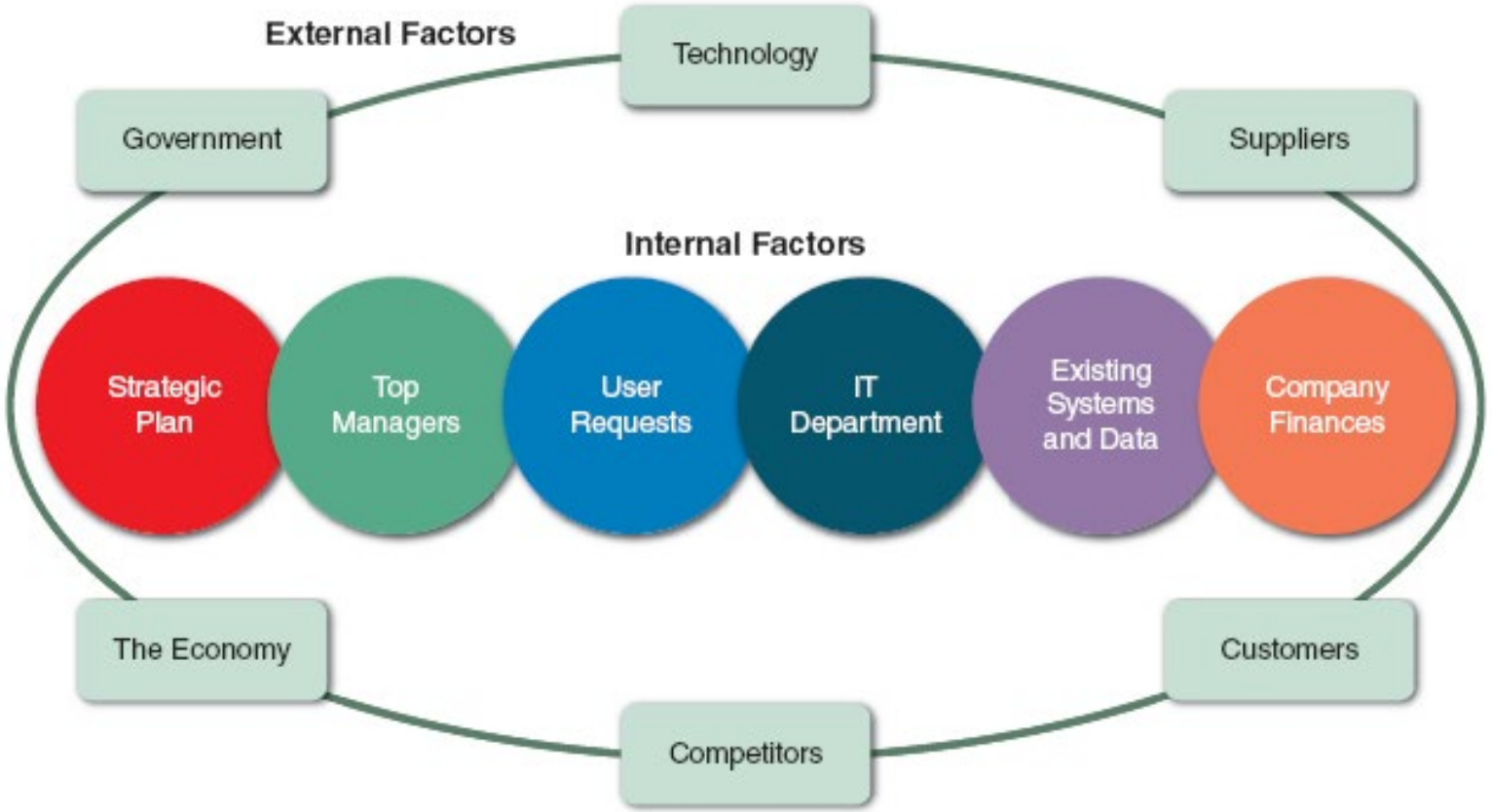


FIGURE 2-6 Internal and external factors that affect IT projects.

Case In Point 2.2
Attaway Airlines, Part 1

- You are the IT director at Attaway Airlines, a small regional air carrier. You chair the company's systems review committee, and you currently are dealing with strong disagreements about two key projects.
- The marketing manager says it is vital to have a new computerized reservation system that can provide better customer service and reduce operational costs.
- The VP of finance is equally adamant that a new accounting system is needed immediately because it will be very expensive to adjust the current system to new federal reporting requirements.
- The VP outranks the marketing manager, and the VP is your boss.

What Factors do you see in this scenario?
What questions and issues should be discussed?

Assessing Request Feasibility (1 of 7)

- Feasibility studies can be simple or exhaustive
  - Effort required depends on nature of request
- Initial fact-finding
  - Studying organizational charts
  - Performing interviews
  - Reviewing current documentation
  - Observing operations
  - Surveying users

Assessing Request Feasibility (2 of 7)

FIGURE 2-12 A feasibility study examines operational, technical, economic, and schedule factors.

Assessing Request Feasibility (3 of 7)

- Operational feasibility
  - Will proposed system be used effectively after it has been developed
    - Can be affected by organizational culture
    - Cannot be accurately measured but requires careful study
  - Questions that can help predict feasibility
    - Is the project supported by management and users?
    - Will the new system result in a workforce reduction?
    - Do legal or ethical issues need to be considered?

Assessing Request Feasibility (4 of 7)

- Economic feasibility
  - Will projected benefits of a proposed system out-weigh total cost of ownership (TCO)
  - Determination of TCO requires cost analysis
    - People, including IT staff and users
    - Hardware and equipment
    - Software
    - Formal and informal training
    - Licenses and fees
    - Consulting expenses and facility costs
    - Estimated cost of not developing or postponing

Assessing Request Feasibility (5 of 7)

- Costs and benefits
  - Tangible costs are measured in dollars
  - Intangible costs can significantly affect organizational performance
  - Tangible benefits can result from a decrease in expenses or an increase in revenues
  - Intangible benefits are important to the company despite the inability to measure them in dollars

Benefits Estimation Challenge 1: Confusing Benefits with System Capabilities

- **Key system capabilities ≠ business benefits**
- **High-level business problem or opportunity:** Defines business issue systems project should address
- **Key system capabilities:** Define key, **high-level software *features*** to address business problem/opportunity
- **Business Benefits:** The ***value*—typically in quantified, monetary terms**—of the key system capabilities
- So…**key system capabilities generate/enable business benefits**

Benefits Estimation Challenge 2: Many Different Sources of Benefits

Software capabilities can be monetized in many different ways:

- **Increasing operational efficiencies** → **Increasing profit margins**
- **Increasing sales of non-IT products**
- **Selling/renting software as a product**
- **Creating custom software**
- **Generating ad revenue/selling data**

→ **Increasing revenues**

- **Continuing to produce current revenues and profits** → **Staying in business**
- **Providing social value** → **Other improvements to stakeholders**

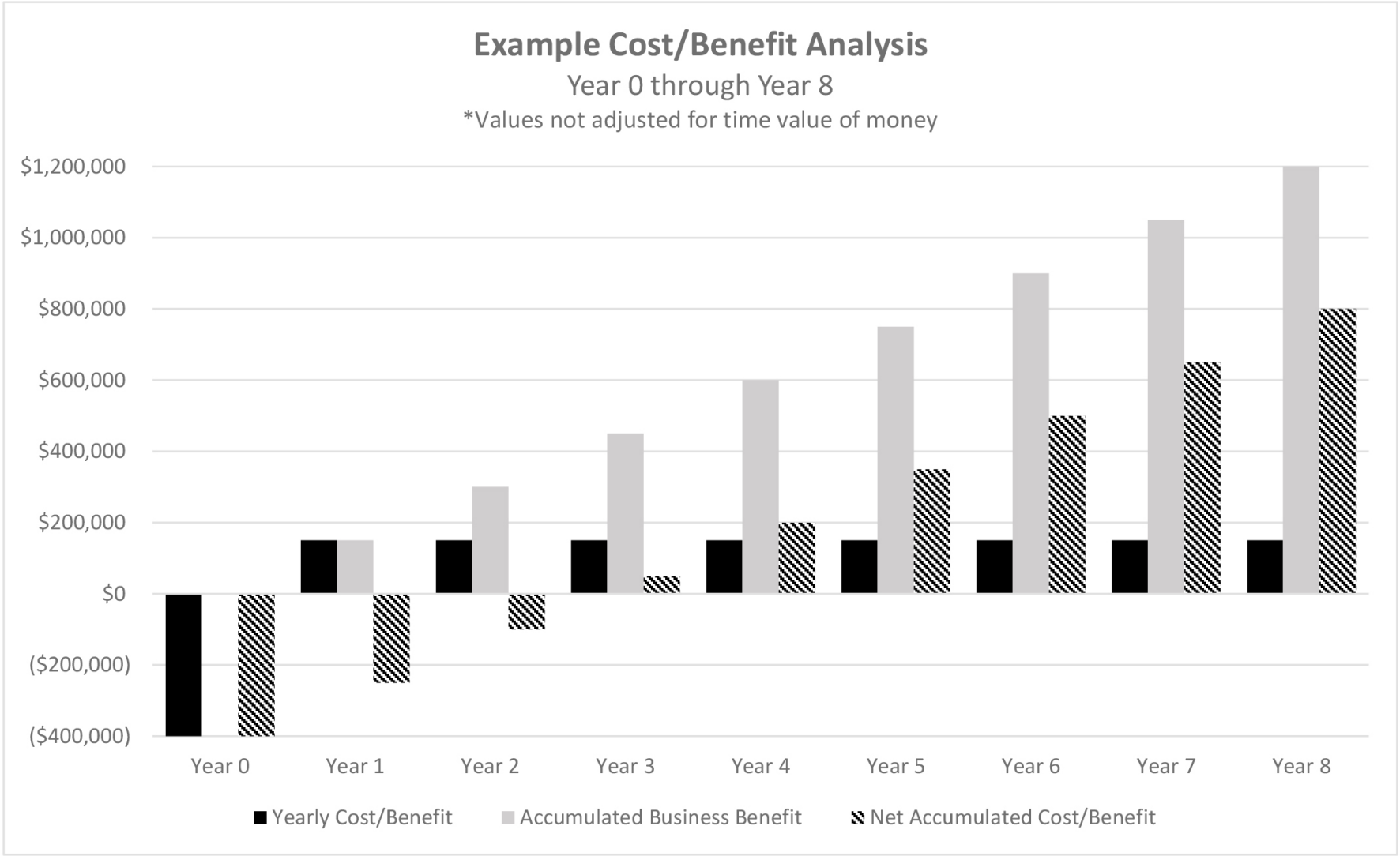
Aligning with four key business goals:

Benefits Estimation Challenge 3: Incremental Benefits and Long-Range Planning Horizons

- **Cost/benefit analysis:** In systems projects complicated by fundamental differences in estimating costs vs. benefits
- **Bulk of systems delivery costs:**
  - **Incurred in "Year 0":** Time period prior to "go live"
  - **One-time:** Although there are some on-going costs (licensing, maintenance)
- **Business benefits:**
  - **Start at beginning of "Year 1":** The day of "go live"
  - **Long-range, repeating:** Software can provide benefits for multiple years (theoretically, forever)

Example: Cost/Benefit Analysis

- Current yearly profit = $200k
- System cost = $400k
- ↓ labor costs = $100k
- ↑ profits from sales = $50k
- New yearly profit = $350k
- Business benefit = **Net ↑ overall profit = $150k**
- *Key points*:
  - Year 0 project costs offset by yearly benefits (Year 1 and beyond)
  - Estimating positive net accumulated cost/benefit by Year 3
  - **Note:** Not taking into account time value of money



Questions Raised by Cost/Benefit Analysis Example

- **How many years into the future to estimate benefits?**
  - Example shows through year 8, but that's arbitrary
  - Software doesn't wear out, so do benefits go on forever?
  - Many possible reasons benefits could stop or fall over time
- **How to value net profit increase of $150k over time?**
  - Even if the system does deliver $150k in incremental profits each year…
  - Is $150k in Year 1 worth the same to us now as $150k in Year 2 (or Year 3, etc.)?
  - Need to consider the "time value of money"
- **Example leads us to Benefits Estimation Challenge 4**

Benefits Estimation Challenge 4: Different Approaches to Comparing Costs and Benefits

- **Two key approaches to cost/benefit analysis:**
  - **Net present value (NPV):** "Theoretically ideal"
    - Future monetary values reduced ("discounted") to reflect time value of money (dollar today is worth more than a dollar tomorrow)
    - May estimate benefits into the distant future
    - Decision rule: Approve project if benefits exceed costs by a single dollar
  - **Return on investment (ROI):** Frequently-used "pragmatic approach"
    - Considers the value of an investment several years into the future without adjusting for the time value of money
    - Typically limits considering benefits to three to five years in the future
    - Decision rules (typical): Approve project if ratio of benefits-to-costs are 2:1 or 3:1

Assessing Request Feasibility (6 of 7)

- Technical feasibility
  - Technical resources required to develop and operate the system
  - Questions analysts should ask
    - Does the company have the necessary hardware, software, and network resources?
    - Does the company have the required technical expertise?
    - Does the proposed platform have sufficient capacity for future needs?
    - Will a prototype be required?

Assessing Request Feasibility (7 of 7)

- Schedule feasibility
  - Project implemented in an acceptable time frame
    - Issue: interaction between time and costs and features
  - Additional schedule feasibility issues
    - Can the company or the IT team control the factors that affect schedule feasibility?
    - Has management established a firm timetable?
    - What conditions must be satisfied?
    - Will an accelerated schedule pose any risks?
    - Will project management techniques be available?

Feasibility Study Output

Is the project feasible?

If NOT…we're done!

If it is…Move onto a Preliminary Investigation

Preliminary Investigation (1 of 3)

- Communicate the project's underlying idea to all relevant stakeholders
- Ensure that the proposed project is aligned with the organization's overall strategy and long-term plans for IT
- Ensure that there is a reasonable likelihood that the project will meet its outcome expectations at an acceptable cost level
- Ensure that the project will not lead to unacceptable risks
- Secure necessary resources (people and money) for the next stage of the project

The Preliminary Investigation (2 of 3)

FIGURE 2-13 Model of a preliminary investigation. Notice the importance of fact-finding in each of the four areas.

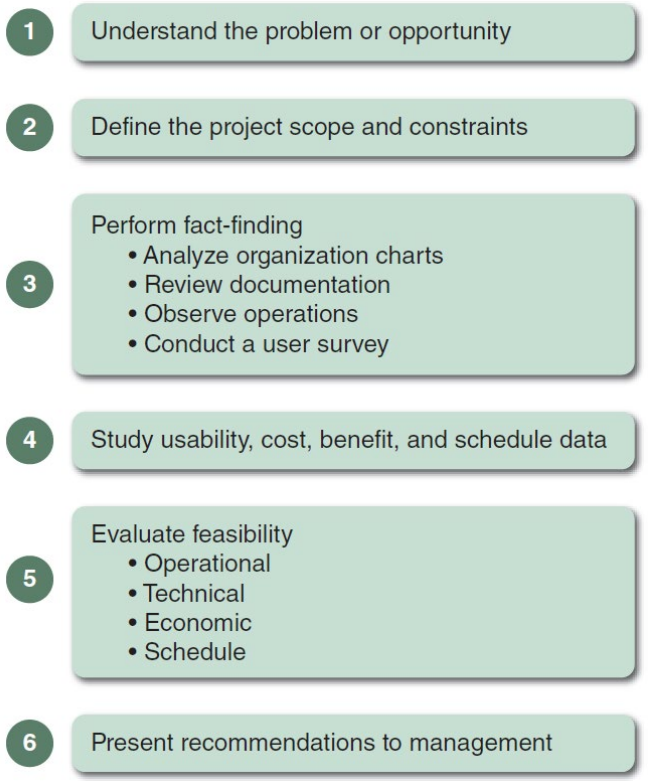


FIGURE 2-14 Six main steps in a typical preliminary investigation.

The Preliminary Investigation (3 of 3)

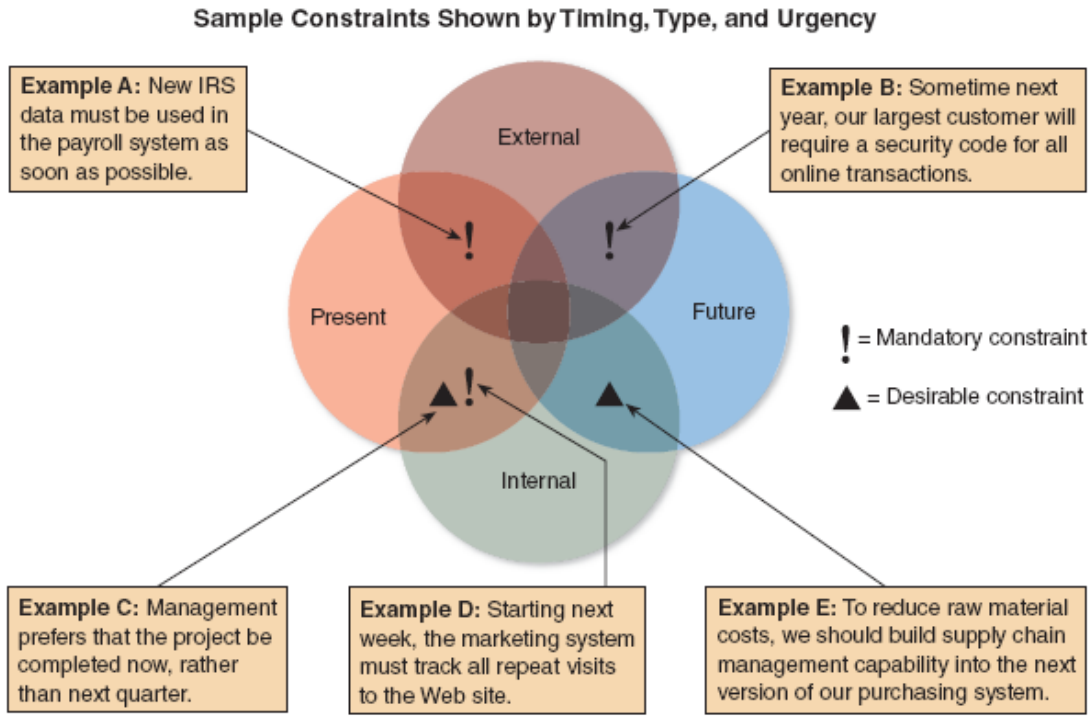


FIGURE 2-16 Examples of various types of constraints.

Preliminary Investigation Output

Does the project still make sense after digging deeper?

If NOT…we're done!

If it does….what's the project's priority

Setting Priorities (1 of 3)

Dynamic priorities

- Changes can cause request priorities to shift

Factors that affect priority

- Will the proposed system reduce costs?
- Will the system increase revenue?
- Will the systems project result in more information or produce better results?
- Will the system serve customers better?
- Will the system serve the organization better?

Setting Priorities (2 of 3)

Can the project be implemented in a reasonable time period?

Are the necessary financial, human, and technical resources available?

Setting Priorities (3 of 3)

Discretionary projects

- Projects where management has a choice in implementing them

Nondiscretionary projects

- No choice
- Many are predictable
  - Annual updates to payroll
  - Tax percentages
  - Quarterly changes

Case In Point 2.3
Attaway Airlines, Part 2

- Back at Attaway Airlines, a new issue has risen. The VP now says that the new accounting system is entitled to the highest priority because the federal government soon will require the reporting of certain types of company-paid health insurance premiums. Because the current system will not handle this report, the VP insists that the entire accounting system is a nondiscretionary project.
- As you might expect, the marketing manager is upset.

Can part of a project be nondiscretionary?
What issues need to be discussed?

Let's Review

- The Business Case tells us if the project makes sense for the Organization
- The Feasibility Study tells us if the project can be done
- The Preliminary Study provides the outline of the project
- The priority sets the stage for implementing the project
- Which leads us to planning the project in more detail!