Chapter 3

Valuing Information Systems Investments

“The most important discoveries of the next 50 years are likely to be ones of which we cannot now even conceive.”

Sir John Maddox, 1999
Learning Objectives

1. Discuss how organizations can use information systems for automation, organizational learning, and strategic advantage.

2. Describe how to formulate and present the business case for an information system.

3. Explain why and how companies are continually looking for innovative ways to use information systems for competitive advantage.
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Valuing Information Systems

Information systems can be used in three ways to add value to an organization:

1. Automating
2. Informating
3. Strategizing
IS for Automating: Doing Things Faster

- With automation, tasks can be completed:
  - Faster
  - Cheaper
  - More accurately
  - With greater consistency
Automating: Example

• Loan processing comparison for 3 methods (from the moment the customer takes the application until the applicant is notified of decision)
  o Manual loan process – 25 to 40 days
  o Technology-supported process – 5 to 20 days
  o Fully automated process – 1 hour to 15 days
IS for Organizational Learning: Doing Things Better

- Information systems can also be used to:
  - Learn about processes
  - Improve processes
  - Support organizational learning
Informating: Example

- Computer-based loan system identifies peak times during the year when specific loans are processed
IS for Supporting Strategy: Doing Things Smarter

- IS used to gain or sustain competitive advantage
  - Turning benefits of automating and informing into strategic advantage
Strategizing: Five Types of Organizational Strategies

- Organizational strategies define the way in which a company plans to gain/sustain competitive advantage.
Overall Low Cost Leadership Strategy

- Offer best prices in the industry or product/service category
- Broad focus
  - Wal-Mart
Focused Low-Cost Strategy

- Offer best prices in the industry or product/service category
- Focus on niche
  - Dell
Broad Differentiation Strategy

- Offer better products/services than the competitors
- Broad Focus
  - Nordstrom
Focused Differentiation Strategy

- Offer better products/services than the competitors
- Focus on niche
  - Apple
    - High-quality computers
    - Home and educational markets
Best-Cost Provider Strategy

• Provide products of reasonably good quality at competitive prices
  ○ Target
Sources of Competitive Advantage

1. Best-made product on the market
2. Superior customer service
3. Achieving lower costs than rivals
4. Having proprietary manufacturing technology
5. Having shorter lead times in research and development projects
6. Having a well-known brand name and reputation
7. Giving customers more value for their money
Competitive Advantage

• How do you identify opportunities to use information systems for competitive advantage?

• Porter’s Value Chain
Value Chain Analysis

- Tool used by managers to identify opportunities for gaining competitive advantage
IS and Value Chain Analysis

Information systems use in adding value:

- Use of Internet
- Use of Extranet/Intranet
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Making the Business Case for an IS

- Identification of benefits that the proposed information system will bring to the organization
  - Automating benefits
  - Informating benefits
  - Strategic benefits
Productivity Gains

• Easy to identify costs with developing an IS

• Difficult to identify productivity gains
  o There are limitation to productivity gains with development of an IS

• Why hasn’t productivity increased at the rate of IS investments?
The Productivity Paradox

- Information systems may be used in unintended ways
  - Web surfing
  - Junk mail
  - Games
Measurement Problems

• Benefits difficult to quantify
  o Wrong things measured
  • efficiency vs. effectiveness

• Example: ATM
**Time Lags**

- Benefits do not always occur at the same time IS is implemented
  - Some IS/IT implementation requires people to gain experience
  - System must be integrated with existing systems
Redistribution

- IS may redistribute the pieces of the pie rather than make the pie bigger
  - Increases in market share come at the expense of the competitors’ market share
Mismanagement

• Bad business model can not be overcome by good information system
  o IS implementation as temporary fix
  o Creation of unanticipated bottlenecks
**Making a Successful Business Case**

- Difficult to quantify benefits of IS
- Money doesn’t grow on trees
- Need to make a strong business case
  - Based on
    - Faith
    - Fear
    - Facts
Arguments Based on Faith

- Arguments based on beliefs about:
  - Organizational strategy
  - Competitive advantage
  - Industry forces
  - Customer perceptions
- Procter & Gamble
Arguments Based on Fear

• Arguments based on the notion that if system is not implemented:
  o Company loses to a competitor
  o Goes out of business

• Automotive industry
Factors in IS Investment Decisions

- Often considered when presenting arguments based on fear
Porter’s Five Forces Model

- Framework used to analyze competition within an industry
Arguments Based on Fact

• Arguments based on:
  o Data
  o Quantitative analysis
  o Indisputable factors
Arguments Based on Fact (II)

- Primary tools:
  - Cost-benefit analysis
    - Identify costs
    - Identify benefits
    - Contrast expected costs and benefits
  - Weighted multicriteria analysis
Cost-Benefit Analysis

• Identifying costs
  o Total cost of ownership (TCO)
    • Cost of acquisition
    • Cost of use
    • Cost of maintenance
  o Recurring vs. Non-recurring costs
  o Tangible vs. Intangible costs
Cost-Benefit Analysis (II)

• Identifying Benefits
  ○ Tangible benefits
    • 5% increase in sales
    • Reduction of order entry errors
  ○ Intangible benefits
    • Improvement to customer service
    • Improvement in overall perception of a firm
Cost-Benefit Analysis (III)

- Contrasts total expected tangible costs with total tangible benefits
  - Break-even analysis – identifies the point when tangible costs equals tangible benefits
  - Net-present value analysis – identifies the present value of future cash flows
Weighted Multicriteria Analysis

- Method used for deciding between alternative IS investments or alternatives of the same system

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Presenting the Business Case

- Persuade decision makers in the firm
  - Know the audience
  - Identify stakeholder groups

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Perspective</th>
<th>Focus/Project Characteristics</th>
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<tbody>
<tr>
<td>Management</td>
<td>Representatives or managers from each of the functional areas within the firm</td>
<td>Greater strategic focus; largest project sizes; longest project durations</td>
</tr>
<tr>
<td>Steering committee</td>
<td>Representatives from various interest groups within the organization (they may have their own agendas at stake when making investment decisions)</td>
<td>Cross-functional focus; greater organizational change; formal cost-benefit analysis; larger and riskier projects</td>
</tr>
<tr>
<td>User department</td>
<td>Representatives of the intended users of the system</td>
<td>Narrow, nonstrategic focus; faster development</td>
</tr>
<tr>
<td>IS executive</td>
<td>Has overall responsibility for managing IS development, implementation, and maintenance of selected systems</td>
<td>Integration with existing systems focus; fewer development delays; less concern with cost-benefit analysis</td>
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**Presenting the Business Case II.**

- Convert benefits to monetary terms

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<th>Benefit:</th>
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<td>New system saves at least one hour per day for 12 midlevel managers.</td>
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Quantified as:

<table>
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<th>Description</th>
<th>Value</th>
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<tr>
<td>Manager’s salary (per hour)</td>
<td>$30.00</td>
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<tr>
<td>Number of managers affected</td>
<td>12</td>
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<tr>
<td>Daily savings (one hour saved × 12 managers)</td>
<td>$360.00</td>
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<tr>
<td>Weekly savings (daily savings × 5)</td>
<td>$1,800.00</td>
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<tr>
<td>Annual savings (weekly savings × 50)</td>
<td>$90,000.00</td>
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Presenting the Business Case III.

• Devise proxy variables
  - Used when clear-cut assessment is not possible
    - Measures of perceived value of change

• Measure what is important to management
  - Case becomes more meaningful
  - Focus on senior management’s “hot button” issues
Assessing Value for IS Infrastructure

• Present holistic view
  o Economic value
  o Architectural value
  o Operational value
  o Regulatory and compliance value

• View IS as asset, rather than necessary expense
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Valuing Innovations

• Which new technology will make or break your business?
Successful Innovation is Difficult

• **Innovation is often fleeting**
  - The advantages gained from innovations are often short lived

• **Innovation is often risky**
  - Sometimes even superior products can lose the race
    • Betamax vs. VHS tapes

• **Innovation choices are often difficult**
  - Foreseeing the future is not always possible
    • In 1994 the Internet was not given much attention
Organizational Requirements for Innovation

• **Process requirements** — the organization has to be willing to do whatever it takes to implement the change

• **Resource requirements** — need to have the human capital necessary for successful deployment of the system

• **Risk tolerance requirements** — organizational members must have appropriate tolerance of risk and uncertainty
Predicting the Next New Thing

- Deciding which innovations to adopt is very difficult

- Diffusion of Innovations
  - Classic view of adoption of innovations

![Graph showing cumulative sales over adoption phases: Innovators, Early Adopters, Early Majority, Late Majority, Laggards.](Image)
The Innovator’s Dilemma

• Disruptive innovations
  o New technologies, products, or services that eventually surpass dominant technologies
    • Online vs. brick and mortar retailing
    • Automobiles vs. horses
    • CDs vs. records
    • MP3 vs. CDs
  o Undermine effective management practices
Disruptive Innovations

- 1970s: mid- and high-performance users were bulk of the market
- Digital Equipment Company (DEC) tried to sell to those markets
- Microcomputers seen as “toys”
Disruptive Innovations (II)

• 1980s: Microcomputers focusing on low-performance users’ needs
• Ignored by DEC
Disruptive Innovations (III)

• 1990s: Growing performance of Microcomputers, meeting mid-performance users’ needs
• DEC lost biggest market segment
Disruptive Innovations (IV)

- Today, microcomputers meeting entire market’s needs
- DEC out of business
- Next disruptive innovation: 3G and 4G mobile phones?
The Innovator’s Solution

• Christensen outlines a process – *disruptive growth engine* – that helps organizations respond to disruptive innovations more effectively

1. Start early
2. Executive leadership
3. Build a team of expert innovators
4. Educate the organization
Implementing the Innovation Process

• E-Business Innovation Cycle
  - The key to success is the extent of IS use in timely and innovative ways
E-Business Innovation Cycle

Choosing Enabling/Emerging Technologies

- Process/group devoted to looking for emerging IT
E-Business Innovation Cycle

Matching Technologies to Opportunities

- Most promising new technology matched with current economic opportunities
E-Business Innovation Cycle

Executing Business Innovation for Growth

• Stage at which the change is actually implemented
E-Business Innovation Cycle

Assessing Value

- Value created for customers and internal operations assessed.
3 Ways to Think About Investments in Disruptive Innovations

• **Put technology ahead of strategy**
  o Technology is so important to success it needs to be considered first
  o Strategy is developed afterwards

• **Put technology ahead of marketing**
  o Rapid development of technology makes it impossible for people to know what they want

• **Innovation is continuous**
  o New technologies are constantly being developed
End of Chapter Content
Opening Case: Managing in the Digital World: Tivo

• Unprecedented control over television viewing
  o Automatic recording of favorite shows
  o Scheduling using the web
  o Pause a show and resume it later
  o Search by actors or a type of a show
  o View photos on your TV
  o Burn DVDs
Protect Company Profits or Employees?

• Dave evaluates a new proposed system and realizes that:
  o The system will save the company much money
  o Introduction of the system will eliminate many jobs

• Should Dave recommend deployment of the proposed system?
Sony’s Secret

- Sony BMG Music Entertainment was using “rootkit” to copyright protect CDs
  - Rootkit was installed on users’ hard drives without their knowledge
  - Left computers vulnerable to malicious intruders – Trojan horses used
  - Rootkit was discontinued and uninstall instructions were given to affected customers
Michael Dell, Founder and Chairman, Dell, Inc.

- High school teacher said Dell would “probably never go anywhere in life”
- In 1990s – Dell was the youngest CEO to head a Fortune 500 company
- Twelfth richest man in 2006
Valuing IT Investments: File Sharing

• 27% of Internet users (36 million people) download music or video files
  o About half download music or video through means other than peer-to-peer networks
  o 28% obtain video files through e-mail or instant messaging
  o 19% obtain video or music files from someone else’s MP3 player

• Majority of the downloaders felt the U.S. could do little to stop file sharing
For Sale by Owner: Your Company’s Name.com

- Domainers – buy and sell domain names
  - 2006 – $9 billion business
  - 2009 – projected to be worth $23 billion

- Ad space renting
  - Domainer registers URL such as Amazon.com
  - Webpage with advertisements is displayed
  - Search engine owner pays money to the domainer for each click on an ad
Organic Light-Emitting Diodes

- Organic light-emitting diode (OLED)
  - Thin film, light emitting diode with organic emissive layer
  - Advantages over LCD
    - Cheaper
    - Thinner screen
    - Less power usage
    - Wider viewing angles
    - Brighter and better resolution
Photo Industry

• In only 4 years (2002-2006) photography moved from film to digital
  o Canon, Konica Minolta no longer make film models
  o Nikon makes 2 film models:
    • 1 for professional photographers
    • 1 for beginners

• Business models changed rapidly
  o Digital technology was a disruptive innovation for the photo industry