Chapter 9
Developing and Acquiring Information Systems

The Nintendo Wii puts the gamer into the game.
Learning Objectives

1. Describe how to formulate and present the business case for technology investments.

2. Describe the systems development life cycle and its various phases.

3. Explain how organizations acquire systems via external acquisition and outsourcing.
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1. Describe how to formulate and present the business case for technology investments.

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Business Case Objectives

- Build a strong, integrated set of arguments and evidence.
- Prove that an information system adds value to the organization or its constituents.
- Ferret out systems that are not adding value.
- Proposed system – determine whether the new system is a “go” or a “no-go”.
- Existing system—determine whether the company will continue to fund the system.
The Productivity Paradox

- IS productivity figures are difficult to demonstrate due to:
  - Measurement problems
  - Time lags
  - Redistribution
  - Mismanagement
The Productivity Paradox

- **Measurement Problems**
  - Effectiveness vs. efficiency
  - Too often the measure is based on efficiency.
The Productivity Paradox (cont’d)

- **Time Lags**
  - Significant delay between initial investment and improvement in the bottom line
The Productivity Paradox (cont’d)

- **Redistribution**
  - New innovations may redistribute the pieces of the pie rather than making the whole pie bigger.
  - No net benefit to the industry, but benefits that make some firms more competitive.
The Productivity Paradox

- **Mismanagement**
  - IS investments might merely be a temporary bandage.
  - May mask or even increase organizational slack and inefficiency
Making a Successful Business Case

- Three common types of arguments in a business case for an IS
  - Faith
  - Fear
  - Fact
Faith
- Arguments are based on beliefs about organizational strategy, competitive advantage, industry forces, customer perceptions, market share, and so on.
- Firm’s mission and objectives, strategy for achieving them, and types of IS needed should be clearly described.
Making a Successful Business Case (cont’d)

- Fear
  - Arguments are based on the notion that if the system is not implemented, the firm will lose out to the competition or, worse, go out of business.
  - Key factors are the competitive forces in the environment, based on Porter’s model (from Chapter 2).
Making a Successful Business Case (cont’d)

- **Fact**
  - Arguments are based on data, quantitative analysis, and/or indisputable factors.
  - Provide a detailed cost-benefit analysis as proof.
Cost-Benefit Analysis

- Identifying costs
  - Total cost of ownership (TCO)
  - Nonrecurring costs vs. recurring costs
  - Tangible costs vs. intangible costs

- Identifying benefits
  - Tangible benefits vs. intangible benefits

- Performing cost-benefit analysis
  - Breakeven analysis
  - Net-present value analysis

- Comparing competing investments
  - Weighted multicriteria analysis
Cost-Benefit Analysis Example

- Worksheet showing a simplified cost–benefit analysis for a Web-based order fulfillment system.
Multicriteria Analysis Example

- Alternative projects and system design decisions can be assisted using weighted multicriteria analysis.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Weight</th>
<th>Alternative A</th>
<th></th>
<th>Alternative B</th>
<th></th>
<th>Alternative C</th>
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<td>Rating</td>
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<td></td>
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<tr>
<td>Developer costs</td>
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<td>60</td>
<td>5</td>
<td>75</td>
<td>3</td>
<td>45</td>
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<tr>
<td>Hardware costs</td>
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<td>4</td>
<td>60</td>
<td>4</td>
<td>60</td>
<td>3</td>
<td>45</td>
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<tr>
<td>Operating costs</td>
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<td>5</td>
<td>75</td>
<td>1</td>
<td>15</td>
<td>5</td>
<td>75</td>
</tr>
<tr>
<td>Ease of training</td>
<td>5</td>
<td>5</td>
<td>25</td>
<td>3</td>
<td>15</td>
<td>3</td>
<td>15</td>
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<td></td>
<td>50</td>
<td>220</td>
<td></td>
<td>165</td>
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<td>180</td>
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<tr>
<td>Total</td>
<td>100</td>
<td>342</td>
<td>415</td>
<td>430</td>
<td></td>
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</tr>
</tbody>
</table>


Presenting the Business Case

- **Know the audience.**
  - People from different areas of the firm typically hold very different perspectives.

- **Convert benefits to monetary terms.**
  - Example: Convert time savings into dollar figures.

- **Devise proxy variables.**
  - Alternative measures of outcomes
  - Example: Reduction in administrative tasks, more customer contact

- **Measure what is important to management.**
  - Concentrate on the issues senior business managers care about.
  - Hot-button issues: Cycle time, regulatory and compliance issues, customer feedback, employee morale
Know the Audience

- Characteristics of Different Stakeholders Involved in Making IS Investment Decisions

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Perspective</th>
<th>Focus/Project Characteristics</th>
</tr>
</thead>
<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>Focus on integration with existing systems; fewer development delays; less concern with cost–benefit analysis</td>
</tr>
</tbody>
</table>

Source: Based on Hoffer et al. (2011) and McKeen, Guimaraes, and Wetherbe (1994).
Factors in Making Investment Decisions

- Investment selection decisions must consider numerous factors and can have numerous outcomes.

![Diagram showing factors in making investment decisions](diagram.png)
Converting Benefits to Monetary Terms

- Converting time savings into dollar figures

<table>
<thead>
<tr>
<th>Benefit:</th>
<th>New system saves at least one hour per day for 12 mid-level managers.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantified as:</td>
<td></td>
</tr>
<tr>
<td>Manager’s salary (per hour)</td>
<td>$30.00</td>
</tr>
<tr>
<td>Number of managers affected</td>
<td>12</td>
</tr>
<tr>
<td>Daily savings (one hour saved × 12 managers)</td>
<td>$360.00</td>
</tr>
<tr>
<td>Weekly savings (daily savings × 5)</td>
<td>$1,800.00</td>
</tr>
<tr>
<td>Annual savings (weekly savings × 50)</td>
<td>$90,000.00</td>
</tr>
</tbody>
</table>
The Systems Development Process

- **Systems analysis and design**
  - Designing, building, and maintaining information systems
  - Follow a standardized approach

- **Systems analyst—a person who performs the systems analysis task.**
  - Requires both technical and managerial expertise

- **Demand for skilled systems analysts is very strong.**
Customized Vs. Off-the-Shelf Software

- General purpose systems typically are purchased off-the-shelf.
- Specific needs often cannot be met by off-the-shelf software.
- Companies capitalizing on a first-mover advantage often cannot purchase existing systems.
  - Examples: online retailing (Amazon.com) and Budget air travel (Southwest Airlines)
Customized Software

- Developed in-house or contracted/outsourced to a specialized vendor
- Advantages of customized software
  - Customizability
    - Fit with business operations, culture, and so on
  - Problem specificity
    - Company only pays for features actually needed.
Off-the-Shelf Software

- Packaged software
- Supports common business processes that do not require any specific tailoring

**Advantages**
- Less costly
- Easy to procure
- Require no specific tailoring
Examples of Off-the-Shelf Software

<table>
<thead>
<tr>
<th>Category</th>
<th>Application</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business information</td>
<td>Payroll</td>
<td>Automation of payroll services, from the optical reading of time sheets to</td>
<td>ZPAY</td>
</tr>
<tr>
<td>systems</td>
<td></td>
<td>generating paychecks</td>
<td>Intuit Payroll</td>
</tr>
<tr>
<td></td>
<td>Inventory</td>
<td>Automation of inventory tracking, order processing, billing, and shipping</td>
<td>Intuit QuickBooks</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>InventoryPower 5</td>
</tr>
<tr>
<td>Office automation</td>
<td>Personal</td>
<td>Support for a wide range of tasks from word processing to graphics to e-mail</td>
<td>OpenOffice</td>
</tr>
<tr>
<td></td>
<td>productivity</td>
<td></td>
<td>Corel</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WordPerfect</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Microsoft Office</td>
</tr>
</tbody>
</table>
Combining Customized and Packaged software

- There are a variety of sources for information systems.

Source for New Information System

- Option 1: Build Information System
- Option 2: Buy Prepackaged System
- Option 3: Outsource Development to Third Party
- Option 4: End-User Development

New Information System for the Organization

XYZ Corp
IS Development in Action

- **Structured process moving through steps**
- **Problem decomposition**
  - Problems broken up into simpler, smaller pieces
- **Systems Analyst role**
  - Help define requirements
  - Manage the project

Diagram:
- **Large Organizational Problem**
- **Problem 1, Problem 2, ..., Problem N**
- **Program 1, Program 2, ..., Program N**
- **Comprehensive Information System**
The Role of Users in Systems Development Process

- Systems analysts rely on information provided by system users.
- Systems users are involved in all phases of system’s development process.
- A mutually respectful relationship is necessary.
- Organizational members need to understand the development activities well.
1. Describe how to formulate and present the business case for technology investments.

2. Describe the systems development life cycle and its various phases.

3. Explain how organizations acquire systems via external acquisition and outsourcing.
Steps in the Systems Development Process

- Systems development life cycle (SDLC)
  - Systems development goes through a cycle
  - Once completed, a systems moves into an ongoing maintenance phase that parallels the initial development process.
Phase 1: Systems Planning and Selection

- Identify, plan, and select a development.
- Possible approaches
  - Formal information systems planning process
  - Ad hoc process for identifying potential projects
- Use evaluation criteria for classifying and ranking potential projects.
- Analyst works with potential users and managers.
- Analyst builds the business case.
### Evaluation Criteria for Systems Projects

- **Multi-criteria decision making**

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic alignment</td>
<td>The extent to which the project is viewed as helping the organization achieve its strategic objectives and long-term goals</td>
</tr>
<tr>
<td>Potential benefits</td>
<td>The extent to which the project is viewed as improving profits, customer service, and so forth, and the duration of these benefits</td>
</tr>
<tr>
<td>Potential costs and resource availability</td>
<td>The number and types of resources the project requires and their availability</td>
</tr>
<tr>
<td>Project size and duration</td>
<td>The number of individuals and the length of time needed to complete the project</td>
</tr>
<tr>
<td>Technical difficulty and risks</td>
<td>The level of technical difficulty involved in successfully completing the project within a given time and resource constraint</td>
</tr>
</tbody>
</table>

Source: Hoffer, George, and Valacich (2011).
Phase 2: Systems Analysis

- Designers gain understanding of current processes.
- Tasks
  - Collecting Systems Requirements
  - Modeling Data
  - Modeling Processes and Logic
- Analysts develop one or many possible designs.
- Analysts evaluate alternative system design approaches.
Collecting Requirements

- Requirements collection—the process of gathering and organizing information from users, managers, customers, business processes, and documents to understand how a proposed information system should function.

- Techniques
  - Interviews
  - Questionnaires
  - Observations
  - Document analysis
  - Joint application design (JAD)
A JAD Room

- JAD—a group meeting—based process for requirements collection
- Users *jointly* define and agree on system requirements or designs
Modeling Data

- Data—facts that describe people, objects, or events.
- Systems analysts must understand what data the information system needs in order to accomplish the intended tasks.
- Data modeling tools are used to collect and describe the data.
  - Example: entity-relationship diagrams
An Entity-Relationship Diagram

- Boxes—data entities.
- Ellipses—attributes.
- Lines—relationships.
Modeling Processes and Logic

- **Data flows**—the movement of data through an organization or within an information system.
- **Processing logic**—the way in which data are transformed.
  - Often expressed in **pseudocode**
  - Variable levels of detail
- **Specifications of data, data flows, and processing logic** leads to design.
Data Flow Model

- Boxes—processes.
- Lines—data flows between processes.
Phase 3: System Design

- The details of the chosen approach are elaborated.

- The elements that must be designed include the following:
  - Human–computer interface
  - Databases and files
  - Processing and logic
Designing the Human-Computer Interface

- **Human-computer interface (HCI)**

- **The point of contact between a system and its users**

- **Data entry form**—business document containing some predefined data, often including some areas where additional data can be filled in.

- **Management report**—business document containing only predefined data for online viewing or printing.
Designing Forms

- Forms are business documents.
  - Contain some data
  - Collect additional data
Designing Reports

- Reports are business documents that contain only predefined data for viewing or printing.

<table>
<thead>
<tr>
<th>REGION</th>
<th>SALESPERSON</th>
<th>SSN</th>
<th>FIRST</th>
<th>SECOND</th>
<th>THIRD</th>
<th>FOURTH</th>
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<tr>
<td>Northwest and Mountain</td>
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<td>18,600</td>
<td>24,300</td>
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<td>28,000</td>
<td>29,000</td>
<td>19,000</td>
<td>31,000</td>
</tr>
</tbody>
</table>
Designing Databases and Files

- Database design is more complete and more detailed than conceptual model.
Designing Processing and Logic

- Processing and logic operations—the steps and procedures that transform raw data inputs into new or modified information.

- Representations of processing logic
  - Pseudocode
  - Structure charts
  - Decision trees
  - Programming code

```plaintext
Processing Logic

i = read (number_of_classes)
total_hours = 0
total_grade = 0
total_gpa = 0
for j = 1 to i
    begin
        read (course [j], hours [j], grade [j])
total_hours = total_hours + hours [j]
total_grade = total_grade + (hours [j] * grade [j])
    end
current_gpa = total_grade / total_hours
```
Phase 4: System Implementation and Operation

- Transformation of design into a working information system
  - software programming and testing

- Preparing the organization for using the new information system
  - system conversion, documentation, user training, and support
Software Programming and Testing

- Programming is the process of transforming the system design into a working computer system.
  - Processing and testing should occur in parallel.
- Tests are conducted before system completion.

<table>
<thead>
<tr>
<th>Testing Type</th>
<th>Focus</th>
<th>Performed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developmental</td>
<td>Testing the correctness of individual modules and the integration of multiple modules</td>
<td>Programmer</td>
</tr>
<tr>
<td>Alpha</td>
<td>Testing of overall system to see whether it meets design requirements</td>
<td>Software tester</td>
</tr>
<tr>
<td>Beta</td>
<td>Testing of the capabilities of the system in the user environment with actual data</td>
<td>Actual system users</td>
</tr>
</tbody>
</table>
System Conversion

- Installation of the new system

(a) Parallel
- Old System
- New System
- Description: Old and new systems are used at the same time.

(b) Direct
- Old System
- New System
- Description: Old system is discontinued on one day, and the new is used on the next.

(c) Phased
- Old System
- New System
- Description: Parts of the new system are implemented over time.

(d) Pilot (single location)
- Old System
- New System
- Description: Entire system is used in one location.
Documentation

- **Information system documentation**
  - Details of the inner workings of the system
  - Written by programmers

- **User-related documentation**
  - Written by professional technical writers
  - User and reference guides
  - User training and tutorials
  - Installation procedures and troubleshooting suggestions
User Training and Support

- Self-paced training and tutorials are the least expensive.
- One-on-one training is the most costly.

<table>
<thead>
<tr>
<th>Training Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tutorial</td>
<td>One person taught at a time by a human or by paper-based exercises</td>
</tr>
<tr>
<td>Course</td>
<td>Several people taught at a time</td>
</tr>
<tr>
<td>Computer-aided instruction</td>
<td>One person taught at a time by the computer system</td>
</tr>
<tr>
<td>Interactive training manuals</td>
<td>Combination of tutorials and computer-aided instruction</td>
</tr>
<tr>
<td>Resident expert</td>
<td>Expert on call to assist users as needed</td>
</tr>
<tr>
<td>Software help components</td>
<td>Built-in system components designed to train users and troubleshoot problems</td>
</tr>
<tr>
<td>External sources</td>
<td>Vendors and training providers to provide tutorials, courses, and other training activities</td>
</tr>
</tbody>
</table>

- Ongoing education may be necessary (system support).
System Maintenance

- Typically starts after software is installed.
- Maintenance phase is where the system is systematically repaired and/or improved.
- The largest part of system development effort occurs at this stage.
Types of Software Maintenance

<table>
<thead>
<tr>
<th>Maintenance Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrective maintenance</td>
<td>Making changes to an information system to repair flaws in the design, coding, or implementation</td>
</tr>
<tr>
<td>Adaptive maintenance</td>
<td>Making changes to an information system to evolve its functionality, to accommodate changing business needs, or to migrate it to a different operating environment</td>
</tr>
<tr>
<td>Perfective maintenance</td>
<td>Making enhancements to improve processing performance or interface usability, or adding desired but not necessarily required system features (in other words, “bells and whistles”)</td>
</tr>
<tr>
<td>Preventive maintenance</td>
<td>Making changes to a system to reduce the chance of future system failure</td>
</tr>
</tbody>
</table>

- Corrective maintenance is given highest priority.
  - This is most likely to occur after initial system installation.
  - Patch management systems help with fixing software bugs.
Patch Management Systems

- Patch management systems are provided by vendors of commercial off-the-shelf software packages.
- The patch management systems use the Internet to check the software vendor’s Web site for available patches and/or updates
  - Example: Windows Update Service
  - The patch provided during the Internet connection is used for corrective (fix bugs) or preventative (plug security holes) maintenance.
Mapping System Maintenance Activities to SDLC

- Obtaining Maintenance Requests
- Systems Planning and Selection
- Systems Implementation and Operation
- Systems Design
- Systems Analysis
- Transforming Requests into Changes
- Designing Changes
- Implementing Changes
Prototyping

- Quick build, with repetitive refinements
- Trial-and-error approach
- Other approaches:
  - Agile Methodologies
  - Extreme Programming
  - Rapid Application Development (RAD)
  - Object-oriented analysis and design
End-User Development

- End-user development is a commonly used practice by tech-savvy managers who want to enhance their decision making and business intelligence.

- Using tools such as Microsoft Access, a sales manager can develop an application to track sales.
Learning Objectives

1. Describe how to formulate and present the business case for technology investments.

2. Describe the systems development life cycle and its various phases.

3. Explain how organizations acquire systems via external acquisition and outsourcing.
Need for Alternatives to Building Systems Yourself

- Building systems in-house is always an option, unless you are faced with:
  - **Situation 1: Limited IS staff**
    - Staff may be too small.
    - Staff may be occupied in other ways.
    - Staff is not capable of developing the system without additional hiring.
  - **Situation 2: IS staff has limited skill set**
    - Many organizations have outside groups manage their Web sites.
      - Take advantage of specialized skills.
Situations When In-House Systems Development Does Not Work

- **Situation 3: IS staff is overworked.**
  - Staff does not have time to work on all the required systems.
- **Situation 4: Problems with performance of IS staff**
  - Derailed IS departments
    - Staff turnover
    - Changing requirements
    - Shifts in technology
    - Budget constraints
External Acquisition

- Purchasing an existing system from an outside vendor such as IBM, HP Enterprise Services, or Accenture
- Similar to the process of deciding which car best meets your needs
  - Requires up-front analysis of your needs
    - How much can you afford to spend?
    - What basic functionality is required?
    - Number of users?
Steps in External Acquisition

- Competitive bid process—find the best system for lowest possible price.
  1. Systems planning and selection
  2. Systems analysis
  3. Development of a request for proposal
  4. Proposal evaluation
  5. Vendor selection
- The first two steps are similar to SDLC.
Development of a Request for Proposal (RFP)

- **RFP**—documentation detailing system requirements sent to prospective vendors
  - Invitation to present bids for the project
  - Often set up in the form of a Web site

Areas covered in an RFP:
1. Summary of existing systems and applications
2. System performance and features
3. Reliability, backup, and service requirements
4. Evaluation criteria
5. Timetable
6. Budget
Proposal Evaluation

- Proposal evaluation—An assessment of proposals received from vendors.
  - May include system demonstrations
  - System benchmarking
    - Standardized tests to compare different proposed systems
    - Common system benchmarks
      - Response time given a specified number of users
      - Time to sort records
      - Time to retrieve a set of records
      - Time to produce a given record
      - Time to read in a set of data
### Commonly Used Evaluation Criteria

<table>
<thead>
<tr>
<th>Hardware Criteria</th>
<th>Software Criteria</th>
<th>Other Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clock speed of CPU</td>
<td>Memory requirements</td>
<td>Installation</td>
</tr>
<tr>
<td>Memory availability</td>
<td>Help features</td>
<td>Testing</td>
</tr>
<tr>
<td>Secondary storage (including capacity, access time, and so on)</td>
<td>Usability</td>
<td>Price</td>
</tr>
<tr>
<td>Video display size</td>
<td>Learnability</td>
<td></td>
</tr>
<tr>
<td>Printer speed</td>
<td>Number of features supported</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Training and documentation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maintenance and repair</td>
<td></td>
</tr>
</tbody>
</table>
Vendor Selection

- Usually more than one system will meet the criteria.
- Determine the best fit
- Need to prioritize/rank the proposed systems
  - Best ranking system is chosen.
  - Formal approach—devise a scoring system for the criteria
  - Less formal approaches:
    - Checklists
    - Subjective processes
Managing Software Licensing

- Software licensing is the permissions and rights that are imposed on applications.
  - Legal and ethical implications of using unlicensed software
  - For organizations using proprietary software:
    - Shrink-wrap licenses (for off-the-shelf software)
    - Click-wrap licenses (for downloaded software)
  - Enterprise licenses
    - Volume licenses
  - Software asset management
    - Helps organizations to better manage the software infrastructure and avoid legal problems
## Managing Software Licenses

<table>
<thead>
<tr>
<th>Restrictiveness</th>
<th>Software Types</th>
<th>Rights</th>
<th>Restrictions</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full rights</td>
<td>Public domain software</td>
<td>Full rights</td>
<td>No restrictions; owner forsakes copyright</td>
<td>Different programs for outdated IBM mainframes</td>
</tr>
<tr>
<td></td>
<td>Nonprotective open source (e.g., Berkeley software development [BSD] license)</td>
<td>Freedom to copy, modify, and redistribute the software; can be incorporated into a commercial product</td>
<td>Creator retains copyright</td>
<td>Free BSD operating system; BSD components in (proprietary) Mac OS X operating system</td>
</tr>
<tr>
<td></td>
<td>Protective open source (e.g., general public license [GPL])</td>
<td>Freedom to copy, modify, and redistribute the software</td>
<td>Modified or redistributed software must be made available under the same license; cannot be incorporated into commercial product</td>
<td>Linux operating system</td>
</tr>
<tr>
<td></td>
<td>Proprietary software</td>
<td>Right to run the software (for licensed users)</td>
<td>Access to source code severely restricted; no rights to copy or modify software</td>
<td>Windows operating system</td>
</tr>
<tr>
<td>No rights</td>
<td>Trade secret</td>
<td>Software typically only used internally</td>
<td>Access to source code severely restricted; software is not distributed outside the organization</td>
<td>Google PageRank™ algorithm</td>
</tr>
</tbody>
</table>
Application Service Providers (ASP)

• Problems
  o Managing the software infrastructure is a complex task.
  o High operating costs
  o Scalability issues

• ASPs provide **software as a service** (SaaS)
  o Reduced need to maintain or upgrade software
  o Variable fee based on actual use of services
  o Ability to rely on a provider’s expertise
Outsourcing Systems Development

- Outsourcing systems development—Turning over responsibility for some or all of an organization’s IS development and operations to an outside firm.
  - Your IS solutions may be housed in their organization.
  - Your applications may be run on their computers.
  - They may develop systems to run on your existing computers (within your organization).
Why Outsourcing?

- **Cost and quality concerns**—higher quality or lower cost systems may be available through outsourcing.
- **Problems in IS performance**—IS departments might have problems meeting acceptable standards.
- **Supplier pressure**—aggressive sales force convinces senior management to outsource IS functions.
- **Simplifying, downsizing, and reengineering**—focusing on core competencies.
Why Outsourcing? (cont’d)

- **Financial factors**—liquidation of IT assets.
- **Organizational culture**—external IS groups are devoid of political ties.
- **Internal irritants**—external IS group may be better accepted by other organizational users.
Managing the IS Outsourcing Relationship

- Ongoing management of an outsourcing alliance is needed.
  1. Strong, active CIO and staff
  2. Clear, realistic performance measurements of the system
  3. Multiple levels of interface between customer and outsourcer
- Full-time relationship managers should be assigned.
Not All Outsourcing Relationships Are the Same

- Outsourcing relationships
  - No longer just a legal contract
  - Strategic, mutually beneficial partnership
  - Different types of outsourcing relationships
    - Basic relationship—“Cash & Carry”
    - Preferred relationship—Set preferential pricing
    - Strategic relationship—Share risks/rewards
End of Chapter Content
Wii differs by providing physical element.

Single player vs. multiplayer
  - At home, in addition to online

Played in living rooms, college dorm rooms, hospital recovery and therapy wards

Geared to casual gamers, success with volume

Shorter, less complicated, more interactive games

4 million consoles were sold during the 2009 holiday season
Moore’s Law and the Laggards

- Moore’s Law and the Laggards
  - Tech industry depends on users to regularly adopt new technology.
  - Often, users want to stick with what they have.
    - Continued AOL dial-up Internet service
    - Continued use of older version of Yahoo! email interface
    - Continued use of unsupported Netscape browser
  - Reasons
    - Prohibitive costs
    - User skepticism that new product is an improvement
      - Example: Vista had slow adoption (prohibitive cost).
  - Company culture determines technology adoption decisions.
    - High risk—Adopt new technology.
    - Low risk—Stick with what organization is using.
COMING ATTRACTIONS
Microsoft’s Surface—Any Place, Any Time

- Microsoft’s Surface
  - Technology shown on CSI Miami
  - Users grab data with fingers using natural gestures, touch
  - According to Bill Gates, surface computing will become pervasive, on all types of surfaces
  - Microsoft Mobile Surface prototype beams touch-enabled interface onto any flat surface.
Genetic Testing

- Genetic testing can reveal personal information.
  - Increased risk of disease → increased health insurance risk
- Mail-order genetic testing laboratories
- Discrimination based on genetic make-up?
- 1990—Study showed that roughly 50 percent of people had experienced genetic discrimination.
  - Health insurance companies
  - Blood banks
  - Adoption agencies
- 2008—Genetic Information Nondiscrimination Act
Hackers, Patches, and Reverse Engineering

- **Hackers**
  - Break into computer systems to steal or manipulate data
  - Look for security holes
    - Study applications until they discover a hole
    - Follow other hackers’ guidelines
    - Reverse engineering patches

- **Patches**
  - Released by software producers
  - Plug security holes

- **How can you deter hackers from reverse engineering patches?**
Blue Security

- Israel-based Internet security company
- Spam messages were returned to the advertiser
  - 6 of the top 10 spammers eliminated Blue Frog’s clients from mailing lists
  - PharmaMaster fought back
  - Blue Security was forced to fold the business.
- “White knights”

Top 10 Malware (March 2010)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Virus</th>
<th>Percentage of Reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>New Trojan/Invo-Zip</td>
<td>12.0</td>
</tr>
<tr>
<td>2</td>
<td>W32/Netsky</td>
<td>9.5</td>
</tr>
<tr>
<td>3</td>
<td>Malware/EncPk-EI</td>
<td>7.8</td>
</tr>
<tr>
<td>4</td>
<td>Trojan/Pushdo-Gen</td>
<td>6.3</td>
</tr>
<tr>
<td>5</td>
<td>Trojan/Agent-HFU</td>
<td>5.6</td>
</tr>
<tr>
<td>6</td>
<td>Malware/Iframe-E</td>
<td>5.5</td>
</tr>
<tr>
<td>7</td>
<td>Trojan/Mdrop-BTV</td>
<td>5.3</td>
</tr>
<tr>
<td>8</td>
<td>Trojan/Mdrop-BUF</td>
<td>4.5</td>
</tr>
<tr>
<td>9</td>
<td>Trojan/Agent-HFU</td>
<td>4.4</td>
</tr>
<tr>
<td>10</td>
<td>Trojan/Agent-HGT</td>
<td>3.9</td>
</tr>
</tbody>
</table>

POWERFUL PARTNERSHIPS

Microsoft’s Bill Gates and Paul Allen

- Gates and Allen were born in Seattle
- High school friendship
- Common interest in computers
- Both dropped out of college (Gates from Harvard, Allen from Washington State)
- Founded Micro-Soft in 1975
- Partnered with IBM to use MS-DOS on PCs
- Windows followed, and Microsoft gained dominance
- Many controversies and lawsuits
- Gates and Allen are no longer active with Microsoft
- Both are multibillionaires.

Microsoft founders Bill Gates and Paul Allen
INDUSTRY ANALYSIS

Broadcasting

• TV and radio are challenged for dominance of entertainment and news media.
  o Many viewers prefer to obtain news via the Internet.
  o 2010: more Americans would give up their TVs to keep the Internet.

• Opportunities for television news companies
  o News features can be quickly transmitted over the Internet.
  o Closer connection between newsroom and “action” on the field
  o Shift in people’s viewing habits
  o Requires change of revenue models

• Change to revenue models
  o Advertisers are less willing to pay high fees.
  o Internet offers more targeted advertising.
  o TV and radio stations can tie advertising to online shows.