

Chapter 13

Implementing EC Systems:
From Justification to Successful Performance
CIS 579 – Technology of E-Business

Joseph H. Schuessler, PhD
Joseph.schuesslersounds.com
Tarleton State University
Stephenville, Texas
schuessler@tarleton.edu

Learning Objectives

1. Describe the major components of EC.
2. Describe the need for justifying EC investments.
3. Understand the difficulties in measuring and justifying EC investments.
4. Recognize the difficulties in establishing intangible metrics.
5. List and describe traditional and advanced methods of justifying EC investments.
6. Describe some examples of EC justification.
7. Describe the role of economics in EC evaluation.

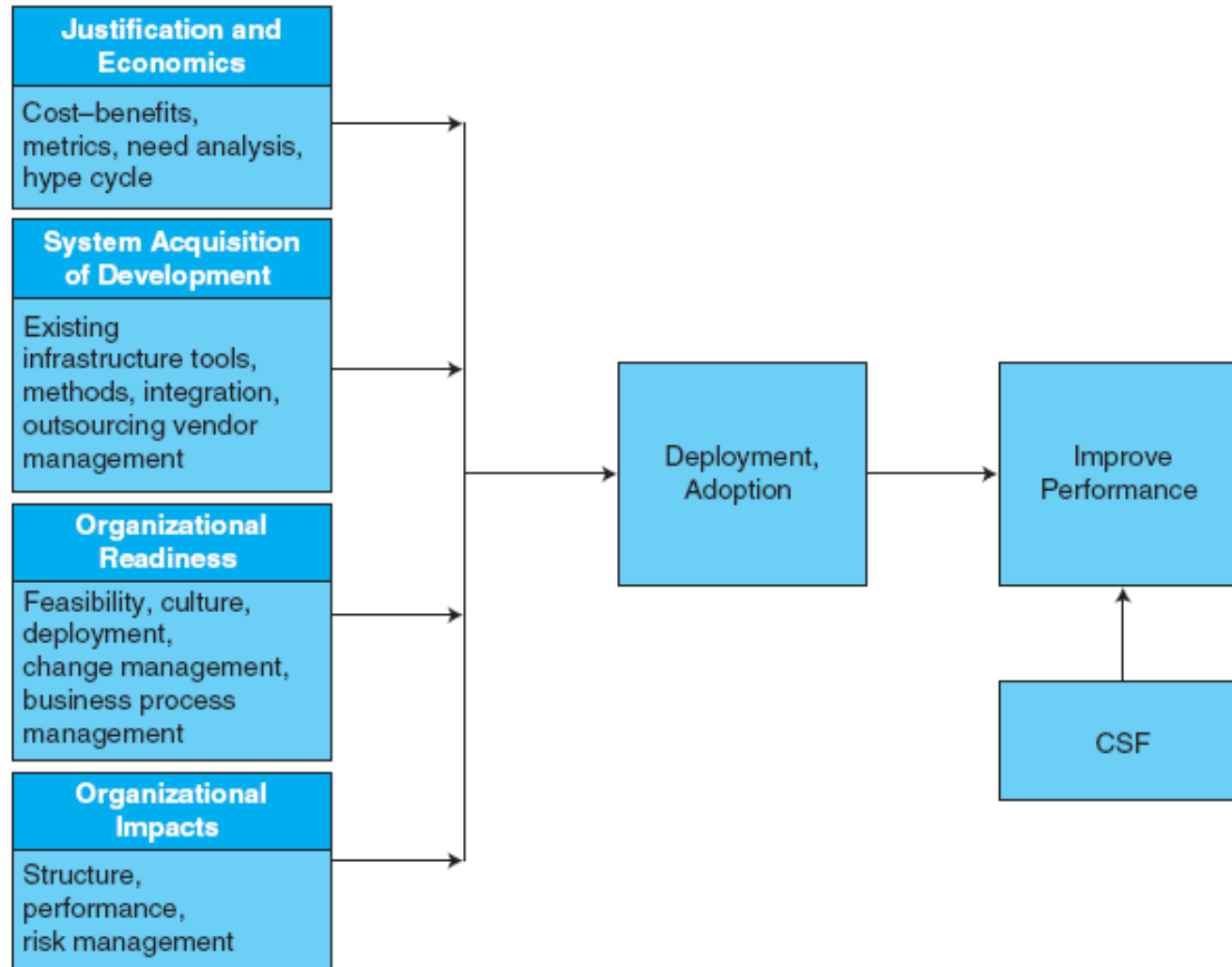
Learning Objectives

8. Discuss the steps in developing an EC system.
9. Describe the major EC development strategies.
10. List the various EC development methods along with their benefits and limitations.
11. Discuss the major outsourcing strategies.
12. Describe the criteria used in selecting software vendors and packages.
13. Describe EC organizational structure, business process management, and change management.
14. Understand how product, industry seller, and buyer characteristics impact the success of EC.

The Implementation Landscape

- **THE MAJOR IMPLEMENTATION FACTORS**
 - Justification/Economics
 - Acquire or Develop Your E-Commerce System
 - Organizational Readiness and Impacts of E-Commerce
 - How to Succeed?

EXHIBIT 13.1 The Elements in EC Implementation



Why Justify E-Commerce Investments?

How Can They Be Justified?

- **INCREASED PRESSURE FOR FINANCIAL JUSTIFICATION**
- **OTHER REASONS WHY EC JUSTIFICATION IS NEEDED**
- **EC INVESTMENT CATEGORIES AND BENEFITS**

Why Justify E-Commerce Investments?

How Can They Be Justified?

- **HOW IS AN EC INVESTMENT JUSTIFIED?**
 - **cost-benefit analysis**

A comparison of the costs of a project against the benefits
 - **Cost-Benefit Analysis and the Business Case**
- **WHAT NEEDS TO BE JUSTIFIED? WHEN SHOULD JUSTIFICATION TAKE PLACE?**

Why Justify E-Commerce Investments?

How Can They Be Justified?

- **USING METRICS IN EC JUSTIFICATION**

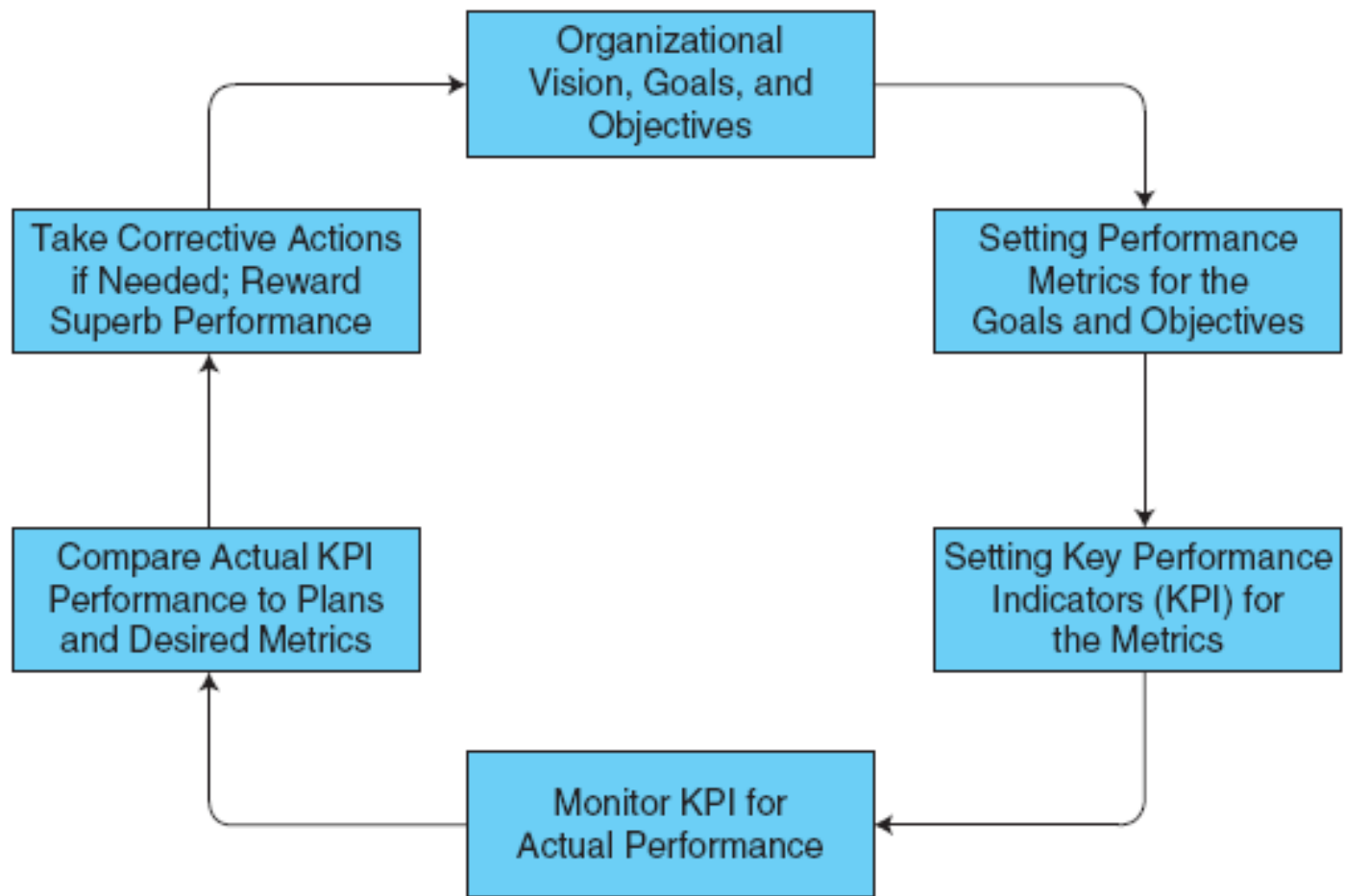
- **metric**

A specific, measurable standard against which actual performance is compared

- **key performance indicators (KPIs)**

The quantitative expression of critically important metrics

EXHIBIT 13.3 How Metrics Are Used in Performance Management



Why Justify E-Commerce Investments?

How Can They Be Justified?

- **Web analytics**

(1) The analysis of clickstream data to understand visitor behavior on a website

(2) The measurement, collection, analysis, and reporting of Internet data for the purposes of understanding and optimizing Web usage

Difficulties in Measuring and Justifying E-Commerce Investments

- **THE EC JUSTIFICATION PROCESS**
- **DIFFICULTIES IN MEASURING PRODUCTIVITY AND PERFORMANCE GAINS**
 - **Data and Analysis Issues**
 - **EC Productivity Gains in One Area May Be Offset by Losses in Other Areas**
 - **Hidden Costs and Benefits**
 - **Incorrectly Defining What Is Measured**
 - **Other Difficulties**

EXHIBIT 13.4 A Model for IT Project Justification

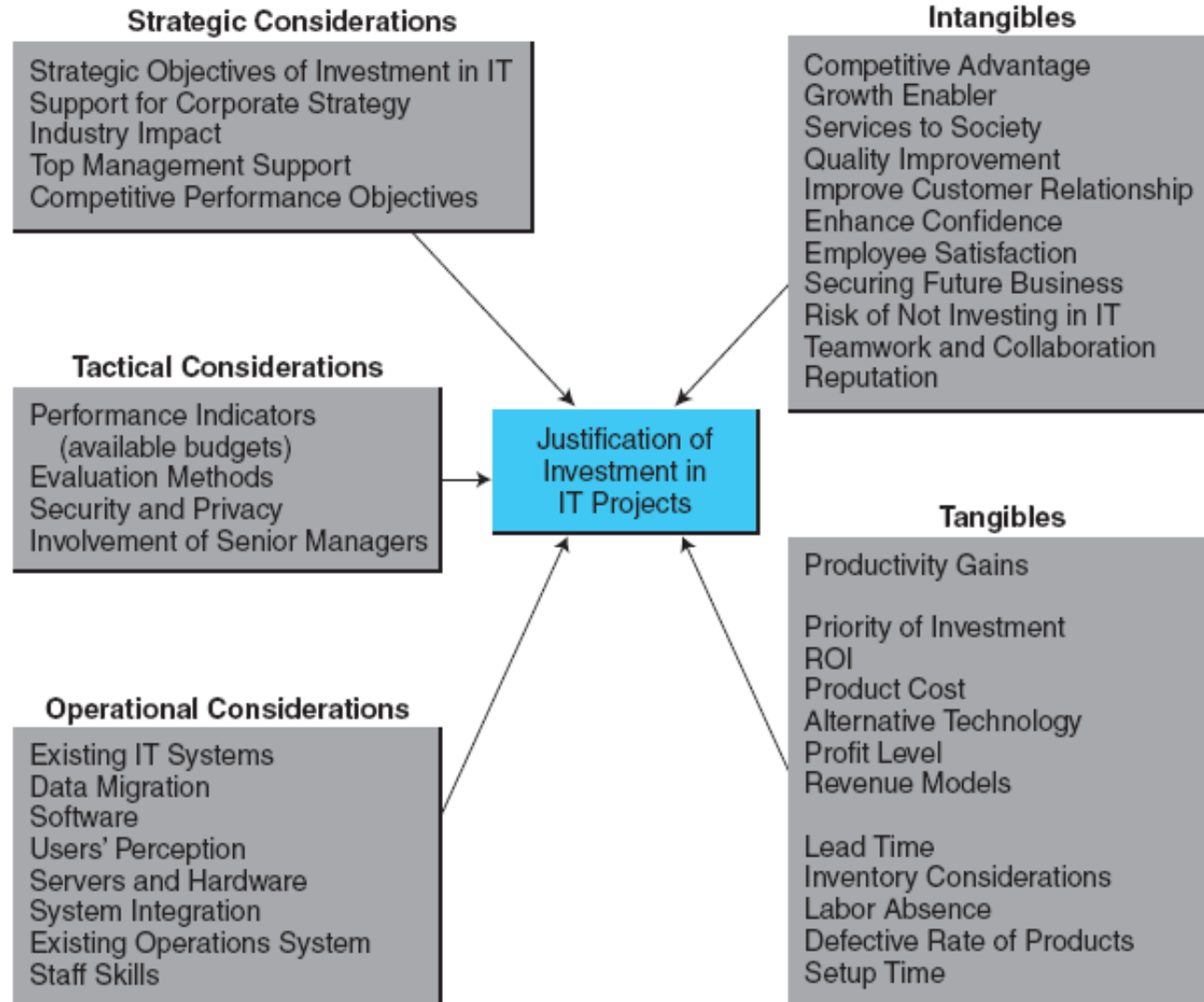
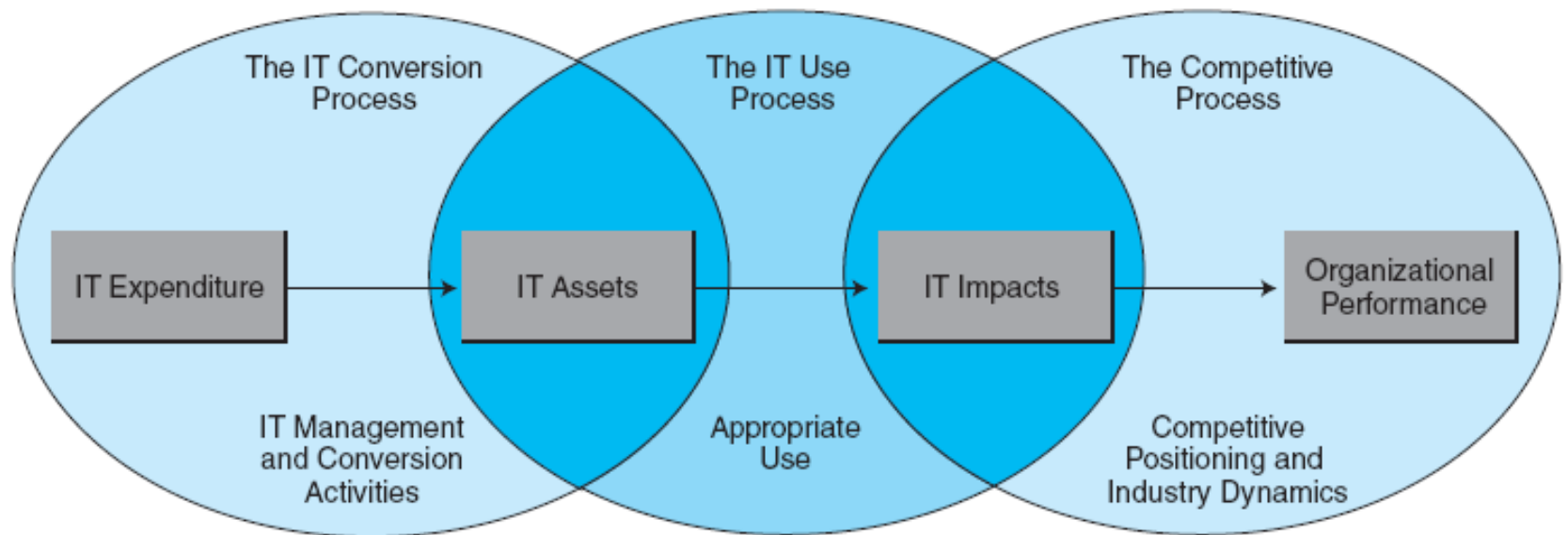


EXHIBIT 13.5 Process Approach to IT Organizational Investment and Impact



Difficulties in Measuring and Justifying E-Commerce Investments

- **INTANGIBLE COSTS AND BENEFITS**
 - **Tangible Costs and Benefits**
 - These costs can be measured through accounting information systems.
 - **Intangible Costs and Benefits**
 - It is necessary to consider intangible benefits in a way that reflects their potential impact.
 - **Handling Intangible Benefits**
 - The first step in dealing with intangible benefits is to define them and, if possible, specify how they are going to be measured.

Difficulties in Measuring and Justifying E-Commerce Investments

- **THE PROCESS OF JUSTIFYING EC AND IT PROJECTS**

- ▶ Lay an appropriate foundation for analysis with your vendor, and then conduct your ROI.
- ▶ Conduct a good research on metrics (including internal and external metrics) and validate them.
- ▶ Justify and document the cost and benefit assumptions.
- ▶ Document and verify all figures used in the calculation. Clarify all assumptions.
- ▶ Do not leave out strategic benefits, including long-term ones. Is the project really bolstering the company's competitive and strategic advantage?
- ▶ Be careful not to underestimate cost and overestimate benefits (a tendency of many managers).
- ▶ Make figures as realistic as possible and include risk analysis.
- ▶ Commit all partners, including vendors and top management.

Difficulties in Measuring and Justifying E-Commerce Investments

- **THE USE OF GARTNER'S HYPE CYCLE**

- **hype cycle**

A graphic representation of the maturity, adoption, and social application of specific IT tools

Difficulties in Measuring and Justifying E-Commerce Investments

- Each hype cycle has five stages that reflect the basic adoption path any technology follows:
 1. Technology trigger
 2. Peak of inflated expectations
 3. Trough of disillusionment
 4. Slope of enlightenment
 5. Plateau of productivity
- **Application of the Hype Cycle**

Methods and Tools for Evaluating and Justifying E-Commerce Investments

- **OPPORTUNITIES AND REVENUE GENERATED BY EC INVESTMENT**
- **METHODOLOGICAL ASPECTS OF JUSTIFYING EC INVESTMENTS**
 - **Types of Costs**
 - Distinguish between initial (up-front) costs and operating costs
 - Direct and indirect shared costs
 - In-kind costs

Methods and Tools for Evaluating and Justifying E-Commerce Investments

- **TRADITIONAL METHODS FOR EVALUATING EC INVESTMENTS**
 - The ROI Method
 - Payback Period
 - NPV Analysis
 - Internal Rate of Return (IRR)
 - Break-Even Analyses

Methods and Tools for Evaluating and Justifying E-Commerce Investments

- **total cost of ownership (TCO)**

A formula for calculating the cost of owning, operating, and controlling an IT system

- **total benefits of ownership (TBO)**

Benefits of ownership that include both tangible and intangible benefits

- **Economic Value Added**

- **Using Several Traditional Methods for One Project**

- **Business ROI Versus Technology ROI**

EXHIBIT 13.6 Evaluating EC and IT Traditional Investments Methods

Method	Advantages	Disadvantages
Internal rate of return (IRR)	Brings all projects to common footing. Conceptually familiar.	Assumes reinvestment at same rate. Can have multiple roots. No assumed discount rate.
Net present value (NPV) or net worth (NW)	Very common. Maximizes value for unconstrained project selection.	Difficult to compare projects of unequal lives or sizes.
Payback period	May be discounted or nondiscounted. Measure of exposure.	Ignores flows after payback is reached. Assumes standard project cash flow profile.
Benefit-to-cost analysis or ratio	Conceptually familiar.	May be difficult to classify outlays as expenses or investments.
Economic value added	Measures net value created for the stakeholder.	The true benefits can be difficult to measure.

Methods and Tools for Evaluating and Justifying E-Commerce Investments

- **IMPLEMENTING TRADITIONAL METHODS**
- **ROI calculator**

Calculator that uses metrics and formulas to compute ROI

- **The Offerings from *Baseline* Magazine**
- **Other Calculators**

Methods and Tools for Evaluating and Justifying E-Commerce Investments

- **ADVANCED METHODS FOR EVALUATING IT AND EC INVESTMENTS**
 1. Financial approaches
 2. Multicriteria approaches
 3. Ratio approaches
 4. Portfolio approaches

EXHIBIT 13.7 **Advanced Methods for EC Justification and Evaluation**

- **Value analysis.** With the value analysis method, the organization evaluates intangible benefits using a low-cost, trial EC system before deciding whether to commit a larger investment in a complete system.
- **Information economics.** Using the idea of critical success factors, this method focuses on key organizational objectives and the potential impacts of the proposed EC project on each of them.
- **Scoring methodology.** This method assigns weights and scores to various aspects of the evaluated project (e.g., weights to each metric) and then calculates a total score. Information economics methods are used to determine the aspects to include in the scoring.
- **Benchmarks.** This method is appropriate for evaluating EC infrastructure. Using industry standards, for example, the organization can determine what the industry is spending on e-CRM. Then the organization can decide how much it should spend.

Benchmarks may be industry metrics or best practices recommended by professional associations or consultants.

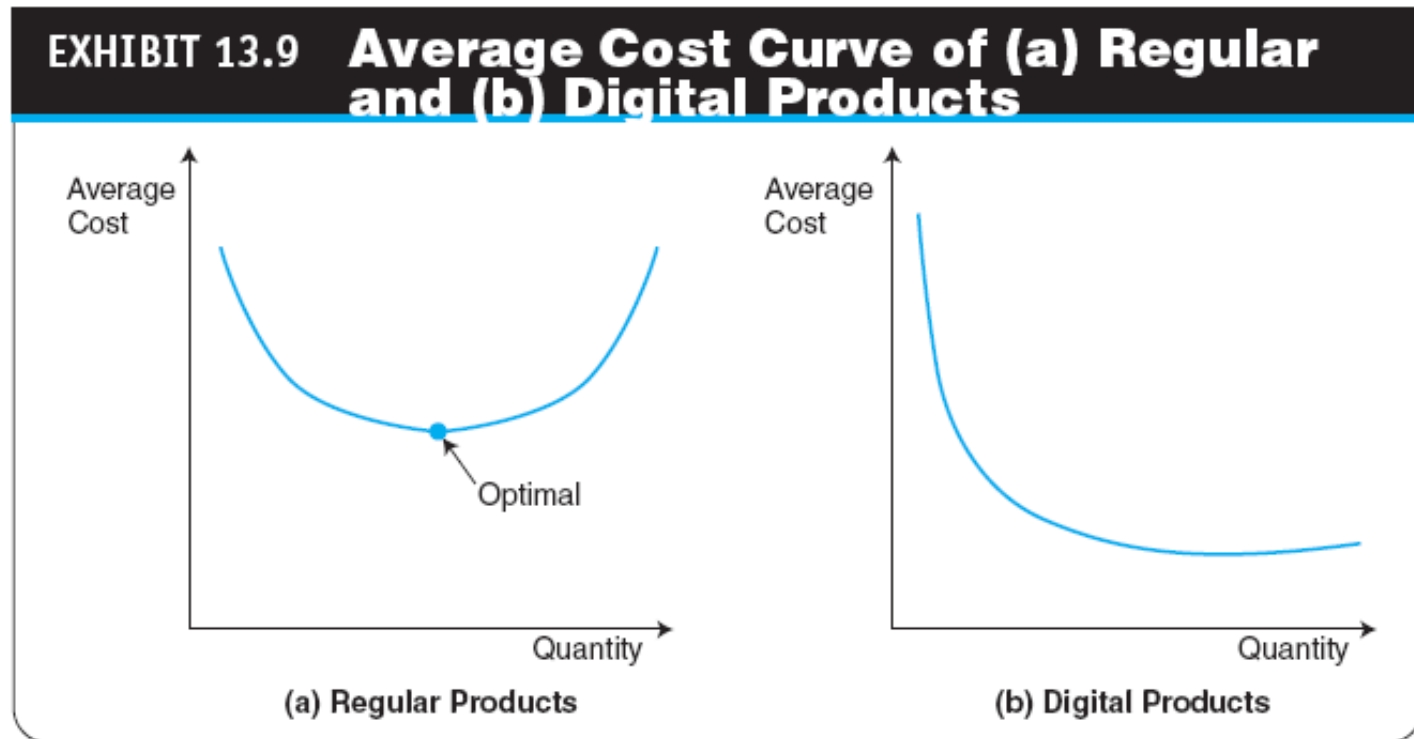
- **Management by maxim.** An organization may use this method to determine how much it should invest in large EC (and IT) infrastructures. It is basically a combination of brainstorming and consensus-reaching methodologies.
- **Real-options valuation.** This is a fairly complex assessment method, and it is used only infrequently. It can be fairly accurate in certain situations. The idea behind this method is to look at future opportunities that may result from the EC investment and then place monetary values on them.
- **Balanced scorecard.** This method evaluates the health or performance of the organization by looking at a broad set of factors, not just financial ones. It is becoming a popular tool for assessing EC projects. (See Beasley, et al. 2006 and Pearlson and Sounders 2006.)
- **Performance dashboard.** This is a variant of the balanced scorecard that is used widely in e-business situations. A dashboard is a single view that provides the status of multiple metrics. (See Pearlson and Sounders 2006.)
- **Activity-based costing and justification.** This managerial accounting concept was adapted for assessing EC investments in recent years and has been proven to be fairly successful. (See Peacock and Tanniru 2005.)

Examples of E-Commerce Metrics and Project Justification

- **JUSTIFYING E-PROCUREMENT**
- **JUSTIFYING A PORTAL**
- **JUSTIFYING SOCIAL NETWORKING AND THE USE OF WEB 2.0 TOOLS**
- **JUSTIFYING AN INVESTMENT IN MOBILE COMPUTING AND IN RFID**
- **JUSTIFYING SECURITY PROJECTS**

The Economics of E-Commerce

- **REDUCING PRODUCTION COSTS**
 - **Product Cost Curves**



The Economics of E-Commerce

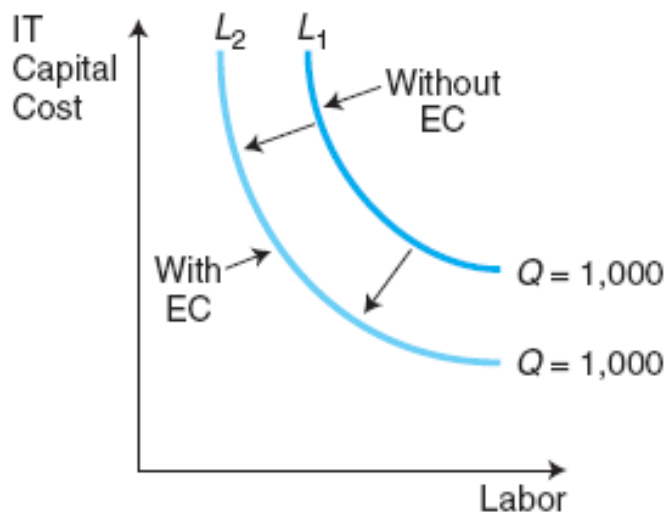
- **production function**

An equation indicating that for the same quantity of production, Q , companies either can use a certain amount of labor or invest in more automation

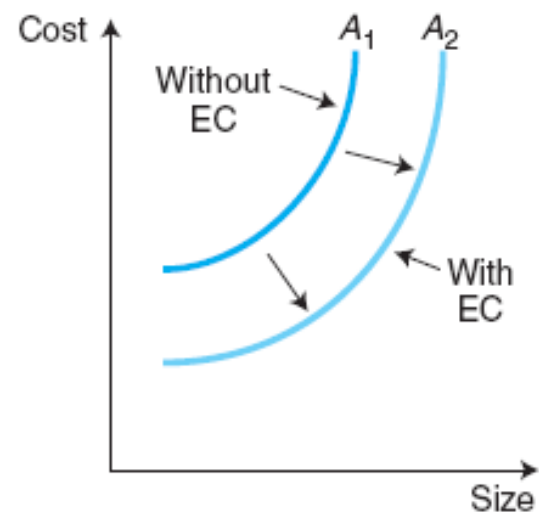
- **agency costs**

Costs incurred in ensuring that the agent performs tasks as expected (also called *administrative costs*)

EXHIBIT 13.10 The Economic Effects of EC: The Production Function and Agency Costs



(a) Production Function



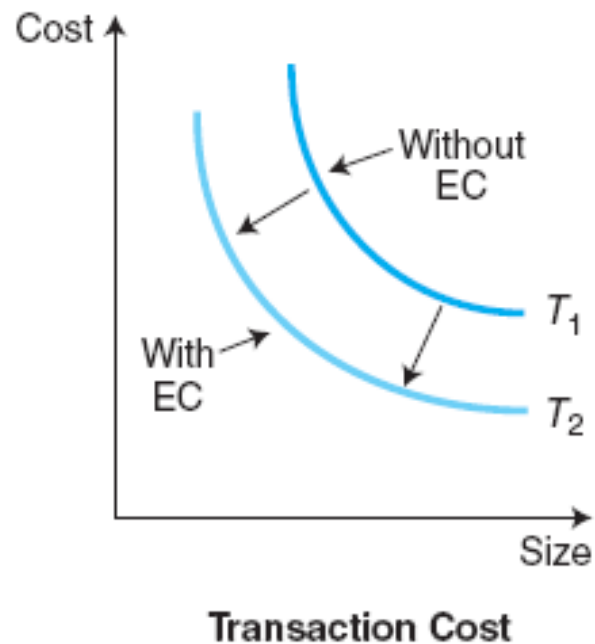
(b) Agency/Administrative Cost

The Economics of E-Commerce

- **transaction costs**

Costs that are associated with the distribution (sale) or exchange of products and services including the cost of searching for buyers and sellers, gathering information, negotiating, decision making, monitoring the exchange of goods, and legal fees

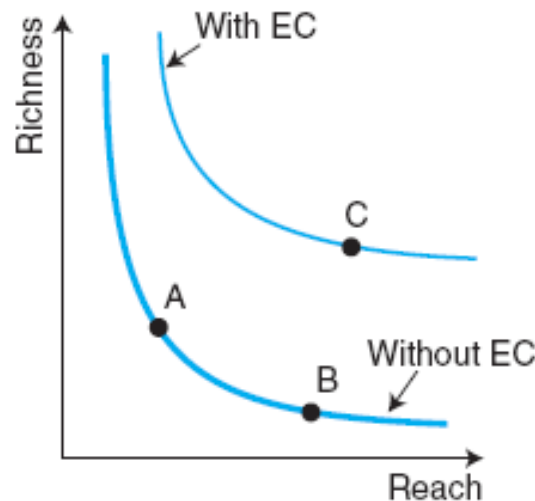
EXHIBIT 13.11 The Economic Effects of EC: Transaction Costs



The Economics of E-Commerce

- **INCREASED REVENUES**
 - Reach Versus Richness
 - Other Ways to Increase Revenues

EXHIBIT 13.12 Reach Versus Richness



The Economics of E-Commerce

- **REDUCING TRANSACTION FRICTION OR RISK**
- **FACILITATING PRODUCT DIFFERENTIATION**
 - **product differentiation**

Special features available in products that make them distinguishable from other products. This property attracts customers that appreciate what they consider an added value
- **EC INCREASES AGILITY**
 - **agility**

An EC firm's ability to capture, report, and quickly respond to changes happening in the marketplace and business environment

The Economics of E-Commerce

- **VALUATION OF EC COMPANIES**

- **valuation**

The fair market value of a business or the price at which a property would change hands between a willing buyer and a willing seller who are both informed and under no compulsion to act

For a publicly traded company, the value can be readily obtained by multiplying the selling price of the stock by the number of available shares.

A Five-Step Approach to Developing an E-Commerce System

- Once it has been determined that a business can benefit from an online presence, the business type, the product line, the business's organization, and the budget dictate what functionality the EC system should have and how the website should be developed.

EXHIBIT 13.14 Elements of an E-Commerce System

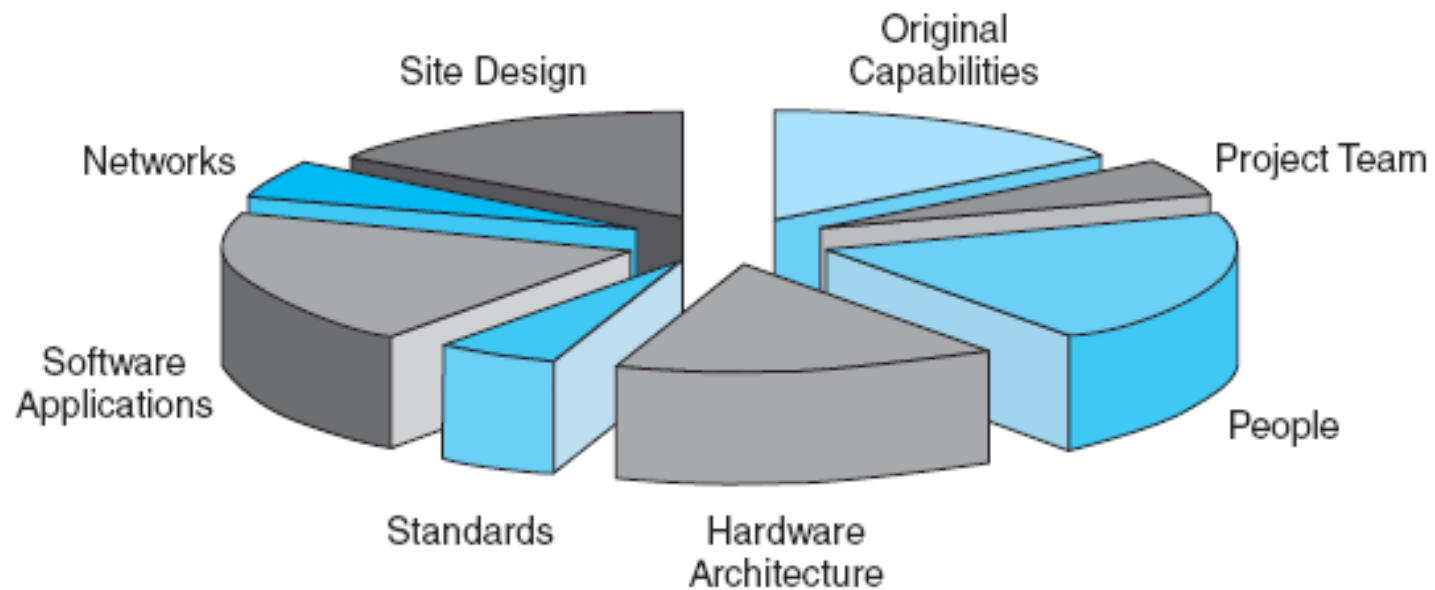
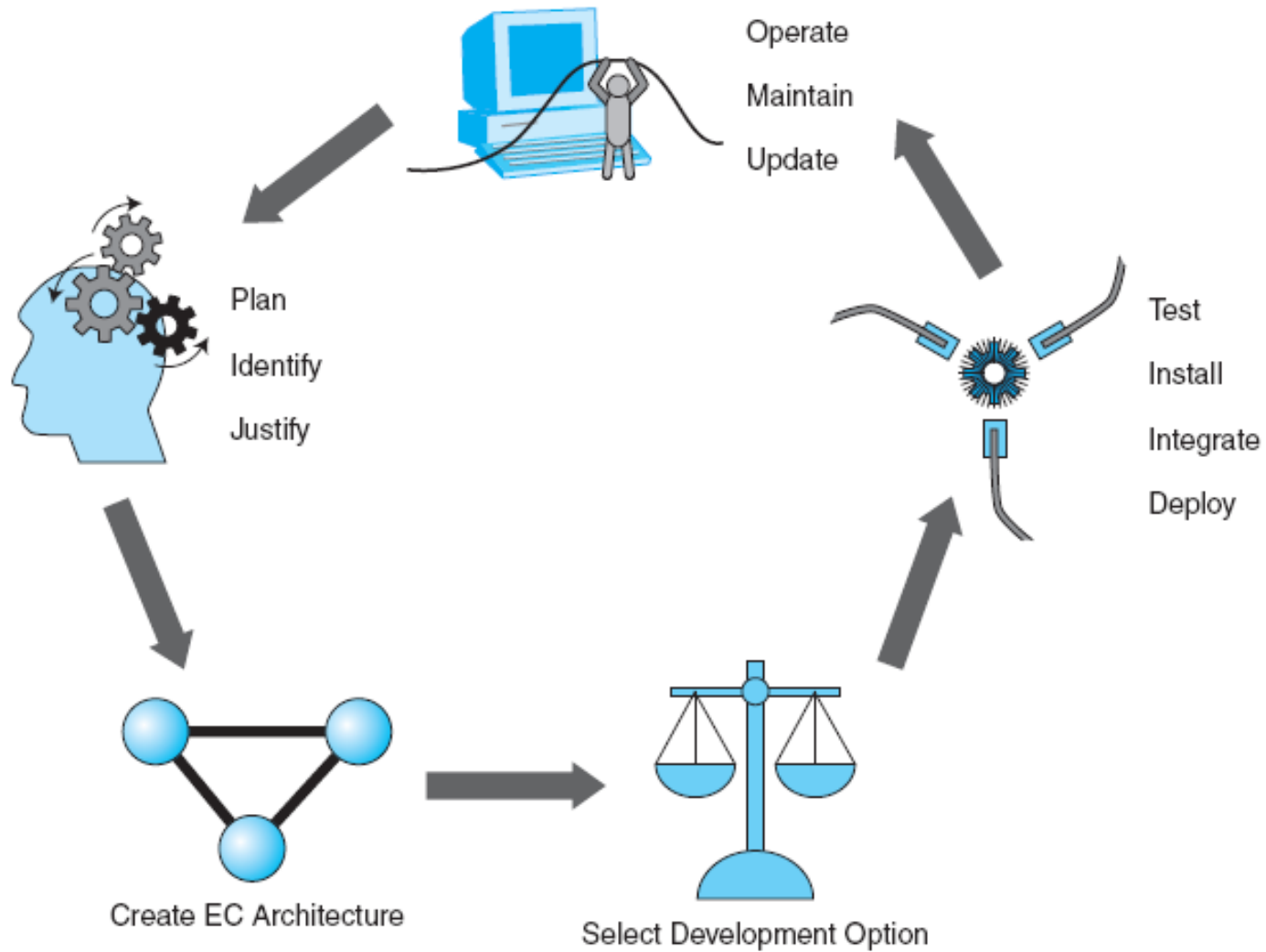


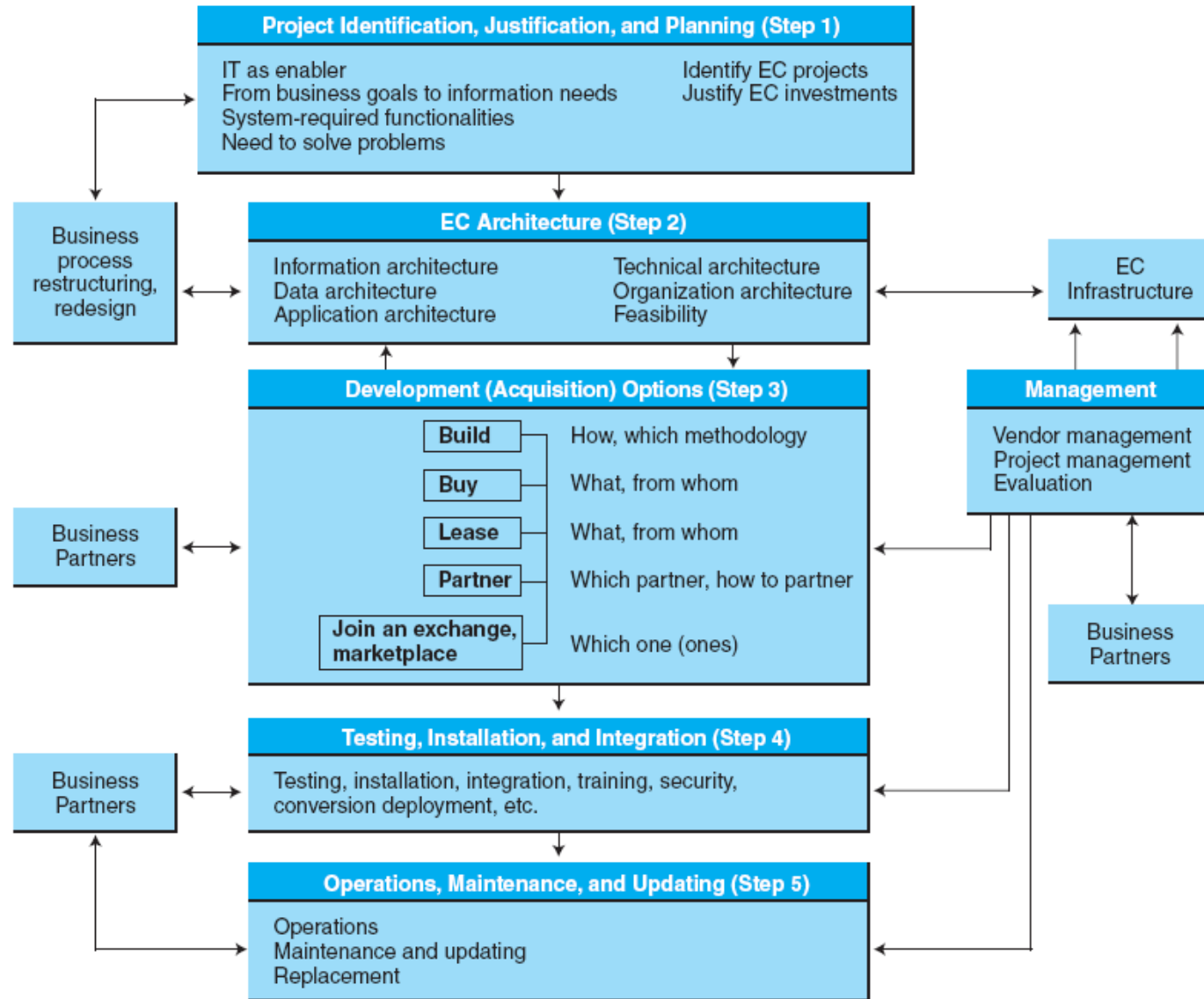
EXHIBIT 13.15 E-Commerce System Life Cycle



A Five-Step Approach to Developing an E-Commerce System

1. Identifying, justifying, and planning ec systems
2. Creating an EC architecture
3. Selecting a development option
4. Installing, testing, integrating, and deploying ec applications
5. Operations, maintenance, and updates

EXHIBIT 13.16 The EC Application Development Process



A Five-Step Approach to Developing an E-Commerce System

- **STEP 2: CREATING AN EC ARCHITECTURE**

- **EC architecture**

A plan for organizing the underlying infrastructure and applications of a site

- **STEP 3: SELECTING A DEVELOPMENT OPTION**

- **STEP 4: INSTALLING, TESTING, INTEGRATING, AND DEPLOYING EC APPLICATIONS**

- **unit testing**

Testing application software modules one at a time

- **integration testing**

Testing the combination of application modules acting in concert

A Five-Step Approach to Developing an E-Commerce System

- **usability testing**

Testing the quality of the user's experience when interacting with a website

- **acceptance testing**

Determining whether a website meets the original business objectives and vision

- **STEP 5: OPERATIONS, MAINTENANCE, AND UPDATES**

- **MANAGING THE DEVELOPMENT PROCESS**

Development Strategies for E-Commerce Projects

- Four basic options for developing an EC website:
 1. Develop the site in-house either from scratch or with off-the-shelf components
 2. Buy a packaged application designed for a particular type of EC site
 3. Outsource system development
 4. Lease the application

Development Strategies for E-Commerce Projects

- **IN-HOUSE DEVELOPMENT: INSOURCING**

- **insourcing**

- In-house development of applications

- **reusability**

- The likelihood a segment of source code can be used again to add new functionalities with slight or no modification

- **interoperability**

- Connecting people, data, and diverse systems; the term can be defined in a technical way or in a broad way, taking into account social, political, and organizational factors

Development Strategies for E-Commerce Projects

- **BUY THE APPLICATIONS (OFF-THE-SHELF APPROACH)**

- **turnkey approach**

Ready to use without further assembly or testing;
supplied in a state that is ready to turn on and operate

- **outsourcing**

A method of transferring the management and/or day-to-day execution of an entire business function to a third-party service provider

- **Types of Outsourcing Options**

Development Strategies for E-Commerce Projects

- **LEASING EC APPLICATIONS: CLOUD COMPUTING AND SOFTWARE-AS-A-SERVICE**

- **cloud computing**

The provision of computational resources on demand via a computer network; you pay only for actual usage

- **Software-as-a-Service (SaaS)**

- **Advantages of Cloud Applications**

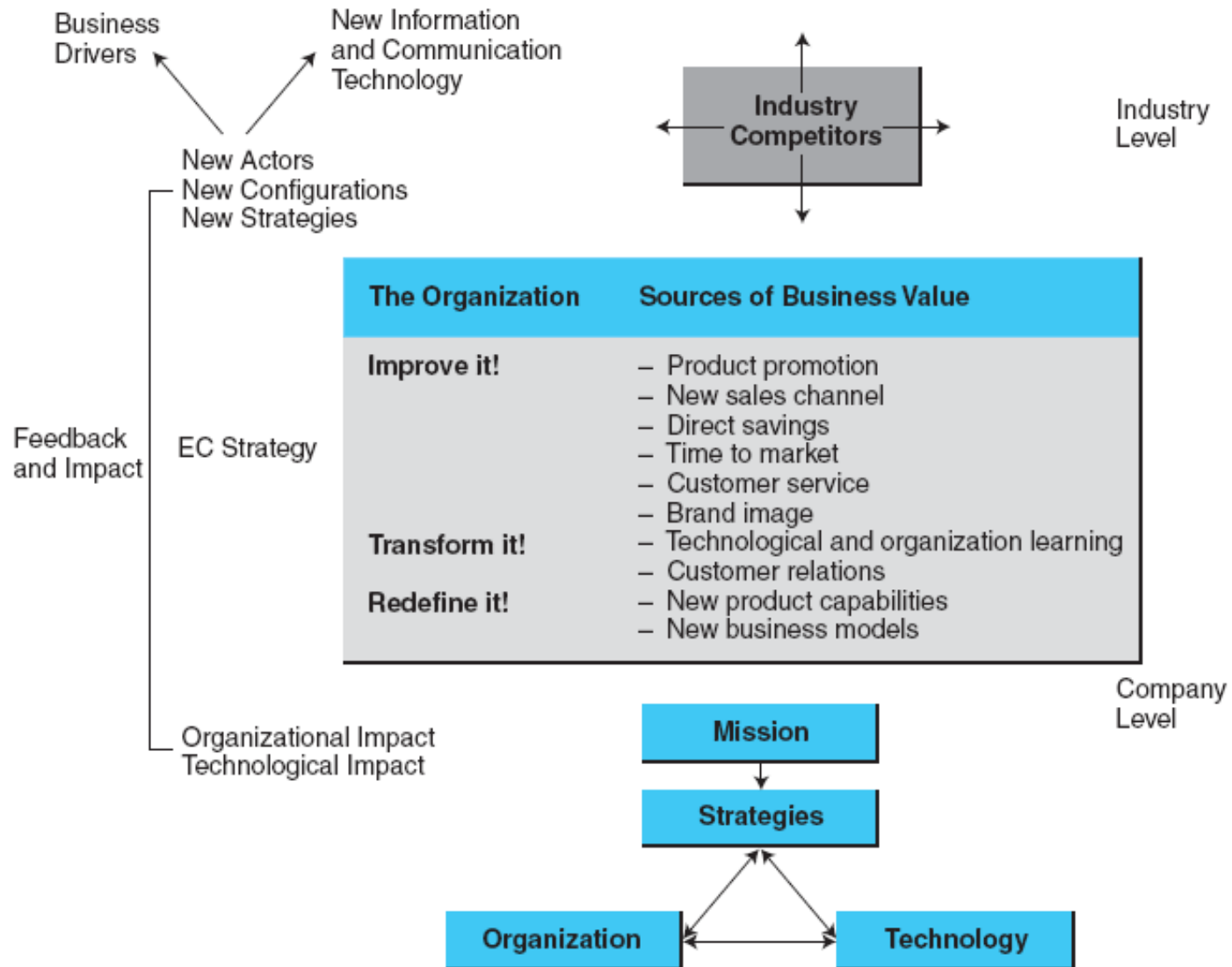
Development Strategies for E-Commerce Projects

- **OTHER DEVELOPMENT OPTIONS**
 - Join an e-marketplace
 - Join a consortium
 - Join an auction or reverse auction third-party site
 - Form joint ventures
 - Use a hybrid approach
- **SELECTING A DEVELOPMENT OPTION**

Organizational Impacts of E-Commerce

- **IMPROVING MARKETING AND SALES**
- **TRANSFORMING ORGANIZATIONS AND WORK**
 - **Technology and Organizational Learning**
 - **The Changing Nature of Work**
 - **Disintermediation and Reintermediation**
 - **disintermediation**
Elimination of intermediaries between sellers and buyers

EXHIBIT 13.18 The Analysis-of-Impacts Framework



Organizational Impacts of E-Commerce

- **Restructuring Business Processes**

- **business process reengineering (BPR)**

A methodology for conducting a comprehensive redesign of an enterprise's processes

- **business process management (BPM)**

A holistic management approach focused on aligning all aspects of an organization with the wants and needs of clients; promotes business effectiveness and efficiency while striving for innovation, flexibility, and integration with technology

Organizational Impacts of E-Commerce

- **REDEFINING ORGANIZATIONS**

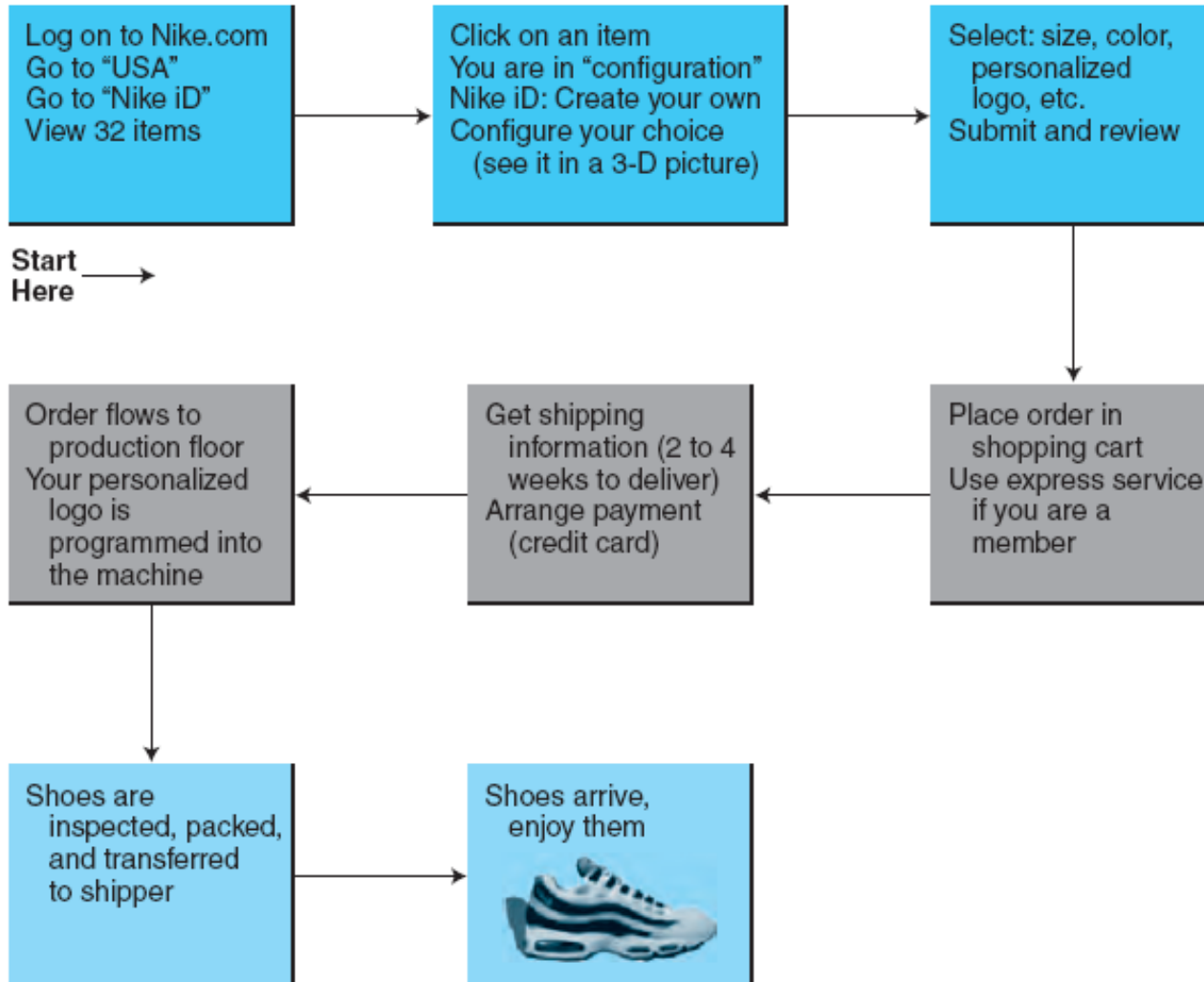
- **New and Improved Product Capabilities**
- **Personalization and Mass Customization**

- **mass customization**

A method that enables manufacturers to create specific products for each customer based on the customer's exact needs

- **Impacts on Manufacturing**

EXHIBIT 13.20 How Customization Is Done Online: The Case of Nike Shoes



Organizational Impacts of E-Commerce

- **change management**

A structured approach to shifting/transitioning individuals, teams, and organizations from a current state to a desired future state; it is an organizational process aimed at empowering employees to accept and embrace changes in their current business environment

Organizational Impacts of E-Commerce

- **HOW TO ORGANIZE AN EC UNIT IN A COMPANY**
 - **Options for Organizing the EC Workforce**
 - Report to the Marketing Department
 - Report to the Finance Department
 - Report to the Chief Operating Officer
 - Distribute the EC Workforce in Several Departments
 - Report to the IT Department
 - Create a New, Autonomous EC Department
 - No Formal Structure for EC
 - **Create an Autonomous Division or a Separate Online Company**

Opportunities for Success in E-Commerce and Avoiding Failure

- **FACTORS THAT DETERMINE E-COMMERCE SUCCESS**
 - E-Commerce Failures
- **E-COMMERCE SUCCESSES**
 - Strategies for EC Success
- **CULTURAL DIFFERENCES IN EC SUCCESSES AND FAILURES**
 - Can EC Succeed in Developing Economies?

EXHIBIT 13.21 Critical Success Factors: Old Economy and EC

Old Economy CSFs

Vertically integrate or do it yourself.
Deliver high-value products.

Build market share to establish economies of scale.
Analyze carefully to avoid missteps.

Leverage physical assets.

Compete to sell product.

EC CSFs

Create new partnerships and alliances; stay with core competency.
Deliver high-value service offerings that encompass products.
Optimize natural scale and scope of business; look at mass customization.
Approach with urgency to avoid being locked out; use proactive strategies.
Leverage intangible assets, capabilities, and relationships—unleash dormant assets.
Compete to control access and relationships with customers; compete with websites.

Managerial Issues

1. How should the value of EC investment be justified?
2. Which investment analysis method should we adopt for EC justification?
3. Who should conduct the justification?
4. Should we use the hype cycle?
5. What is the outsourcing strategy?
6. Should we embark on cloud computing products for our EC initiatives?
7. Which strategy should we choose for vendor selection: the inside-out or outside-in approach?
8. What kinds of organizational changes may be needed?
9. Is it possible to predict EC success?

Summary

1. The major components of EC implementation
2. The need for EC justification
3. The difficulties in justifying EC investment
4. Difficulties in established intangible metrics
5. Traditional methods for evaluating EC investments
6. Describe the justification of representative EC projects
7. EC economic evaluation

Summary

8. The major steps in developing an EC system.
9. The major EC development strategies, along with their advantages and disadvantages.
10. The varied EC application development methods, along with their benefits and limitations.
11. EC application outsourcing strategies.
12. Criteria used in selecting software vendors and packages.
13. The impact of e-markets on organizations.
14. Reasons for EC success and failure.