MANAGEMENT INFORMATION SYSTEMS

Chapter 3
Information Systems, Organizations, and Strategy

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Learning Objectives

1. **Identify** and **describe** important features of organizations
2. **Demonstrate** how Porter's competitive forces model helps companies develop competitive strategies using information systems
3. **Explain** how the value chain help businesses identify opportunities for strategic information system applications.
4. **Demonstrate** how information systems help businesses use synergies, core competencies, and network-based strategies to achieve competitive advantage.

Opening Case: AT&T or Verison

Verizon and AT&T illustrates some of the ways that information systems help businesses compete

- The telecommunications industry in which both companies operate is extremely crowded and competitive, with both vying with cable firms, new upstarts, and each other to provide a wide array of digital services as well as voice transmission.

- To meet the challenges of surviving and prospering in this environment, each of these firms focused on a different competitive strategy using technology.

Opening Case: AT&T or Verison

- Both companies identified opportunities to use information technology to offer new products and services.

  ✓ AT&T's strategy emphasized keeping costs low while capitalizing on innovations from other technology vendors (iPhone).

  ✓ Verizon's strategy involved high up-front costs to build a high-capacity network infrastructure, and it also focused on providing a high level of network reliability and customer service.

Organizations and Information Systems

Why study the organization:

- You will need to understand how information systems can change social and work life in your firm.

- You will not be able to design new systems successfully or understand existing systems without understanding your own business organization.

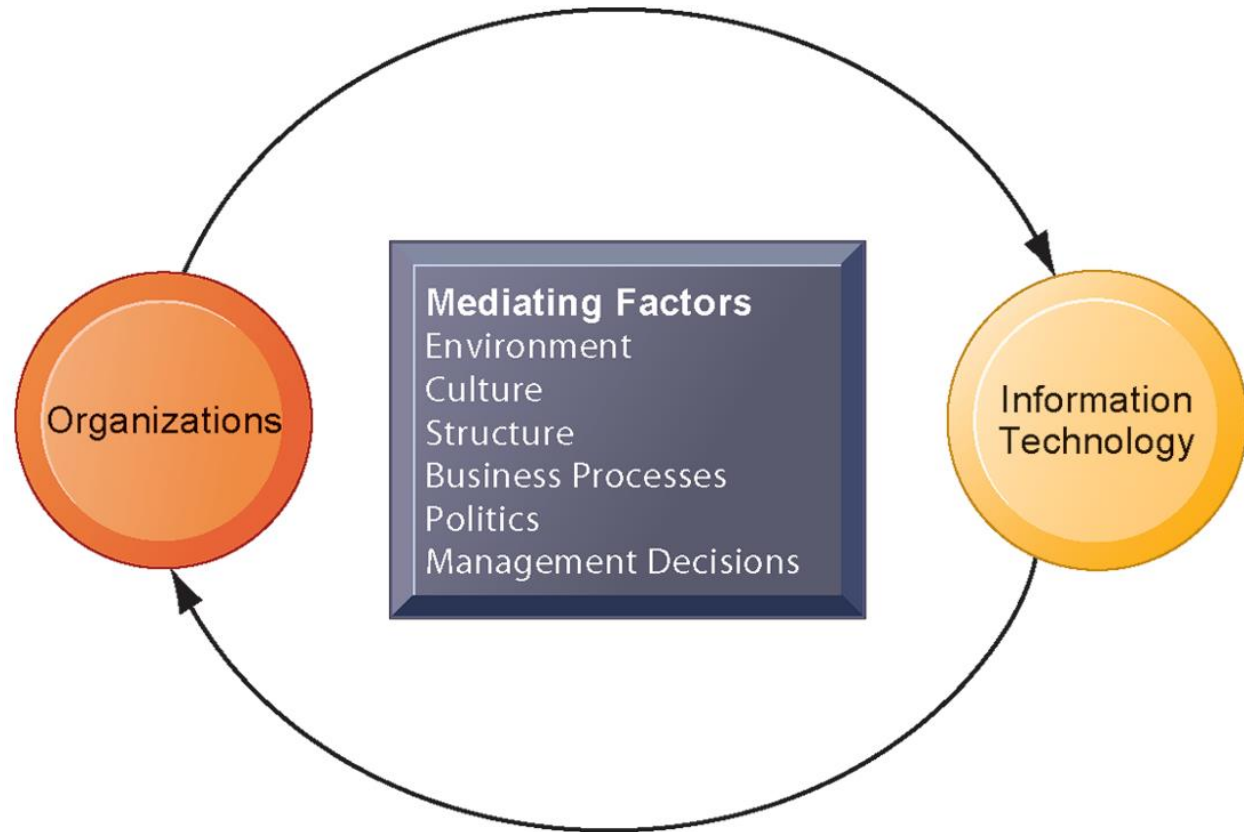# Organizations and Information Systems

- Information technology and organizations influence each other
  - Information systems are built by managers to serve the interests of the business firm.
  - At the same time, the organization must be aware of and open to the influences of information systems to benefit from new technologies.

Organizations and Information Systems

- Information technology and organizations influence each other
  - Relationship influenced by organization's
    - **Structure**
    - **Business processes**
    - **Politics**
    - **Culture**
    - **Environment**
    - **Management decisions**

Organizations and Information Systems

This complex two-way relationship is mediated by many factors, not the least of which are the decisions made—or not made— by managers. Other factors mediating the relationship include the organizational culture, structure, politics, business processes, and environment.

Mediating Factors
Environment
Culture
Structure
Business Processes
Politics
Management Decisions

Organizations

Information Technology

Organizations and Information Systems
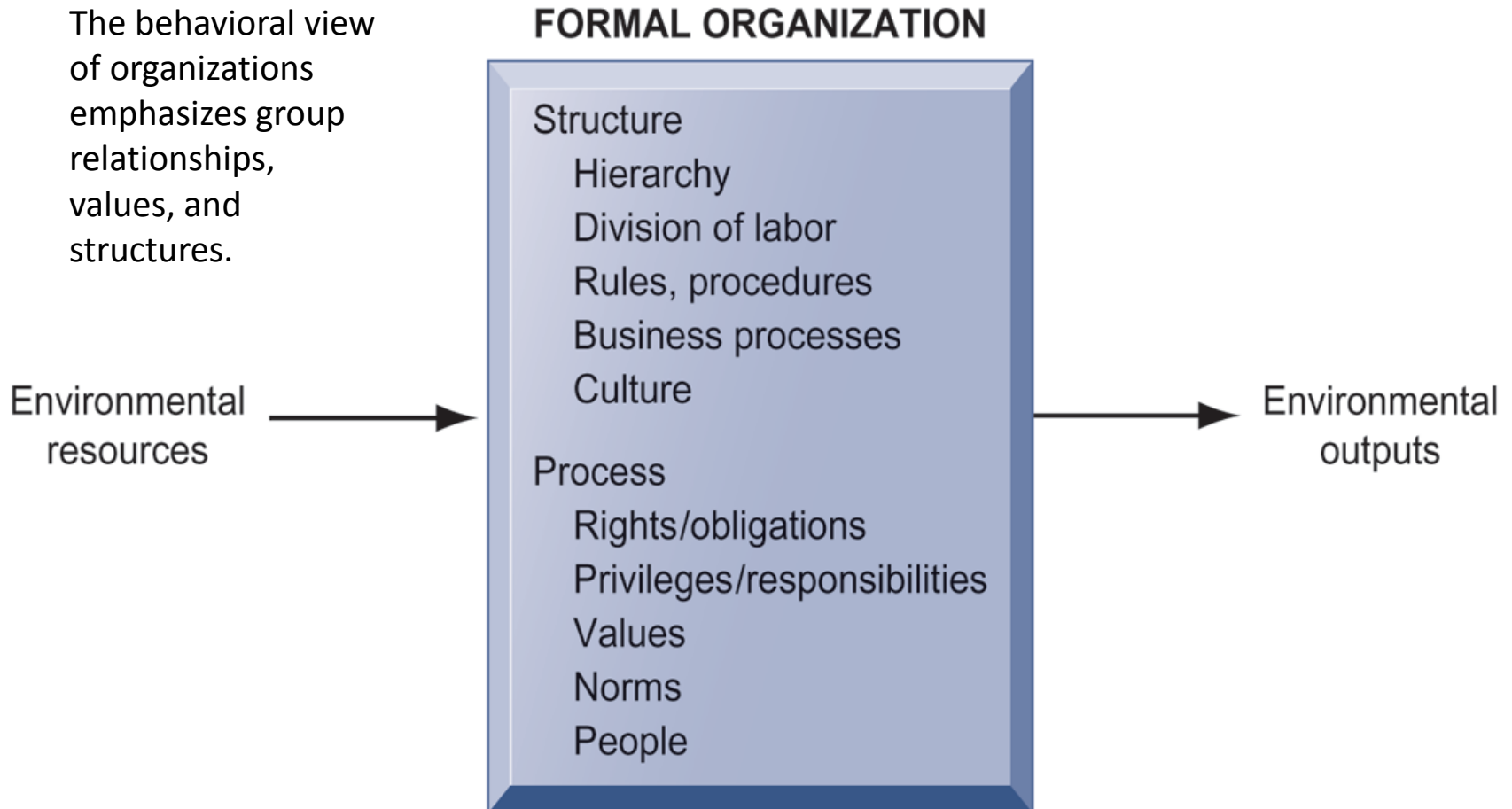
- What is an organization?
  - Technical definition:
    - Formal social structure that processes resources from environment to produce outputs
    - A formal legal entity with internal rules and procedures, as well as a social structure
  - Behavioral definition:
    - A collection of rights, privileges, obligations, and responsibilities that is delicately balanced over a period of time through conflict and conflict resolution

Organizations and Information Systems
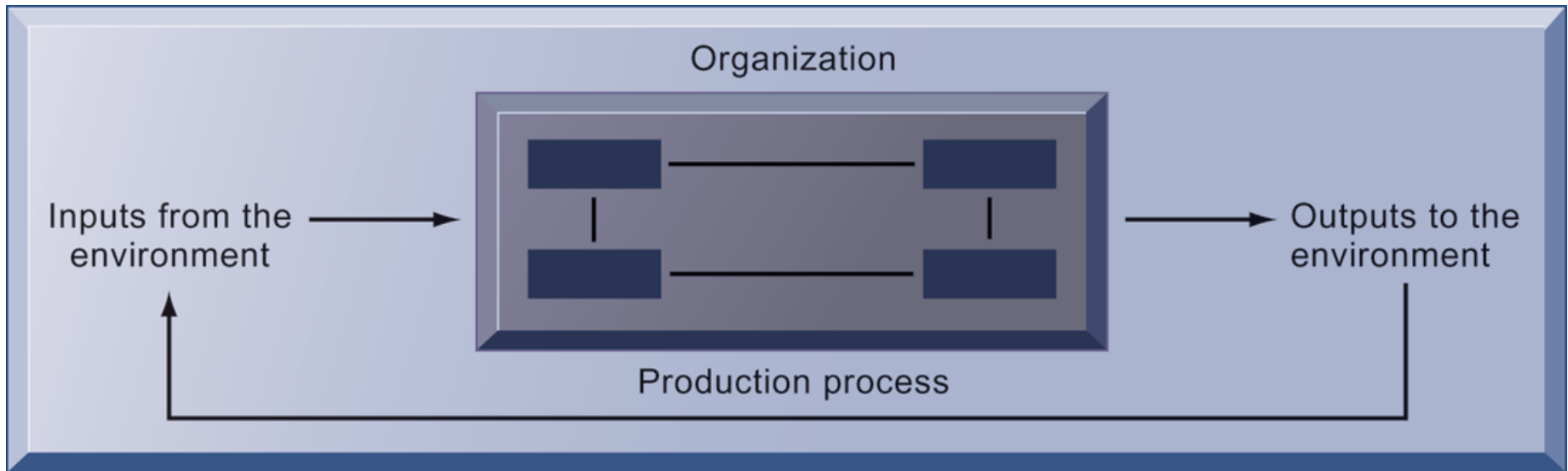
In the technical definition of organizations, capital and labor (the primary production factors provided by the environment) are transformed by the firm through the production process into products and services (outputs to the environment). The products and services are consumed by the environment, which supplies additional capital and labor as inputs in the feedback loop.

Organizations and Information Systems

The behavioral view of organizations emphasizes group relationships, values, and structures.

FORMAL ORGANIZATION

Structure
 Hierarchy
 Division of labor
 Rules, procedures
 Business processes
 Culture

Process
 Rights/obligations
 Privileges/responsibilities
 Values
 Norms
 People

Environmental resources →

→ Environmental outputs

Organizations and Information Systems

In the technical view,

A technical view of organizations encourages us to focus on how inputs are combined to create outputs when technology changes are introduced into the company. The firm is seen as infinitely malleable, with capital and labor substituting for each other quite easily.

Organizations and Information Systems

But the more realistic behavioral definition suggests that building new information systems involves much more than a technical rearrangement of machines or workers

Organizations and Information Systems

The behavioral view,

- information systems change the organizational balance of rights, privileges, obligations, responsibilities, and feelings that have been established over a long period of time.

- Changing these elements can take a long time, be very disruptive, and requires more resources to support training and learning.

Organizations and Information Systems

- Technological change requires changes in who owns and controls information, who has the right to access and update that information, and who makes decisions about whom, when, and how.

- This more complex view forces us to look at the way work is designed and the procedures used to achieve outputs.

Organizations and Information Systems

The technical and behavioral definitions of organizations are not contradictory, they complement each other:

- The technical definition tells us how thousands of firms in competitive markets combine capital, labor, and information technology,

- whereas the behavioral model takes us inside the individual firm to see how that technology affects the organization's inner workings.

Features of Organizations

- Features of organizations

  - Use of hierarchical structure: clear-cut divisions of labor and specialization

  - Routines and business processes

  - Organizational politics,

  - Culture,

  - Environments,

  - Structures

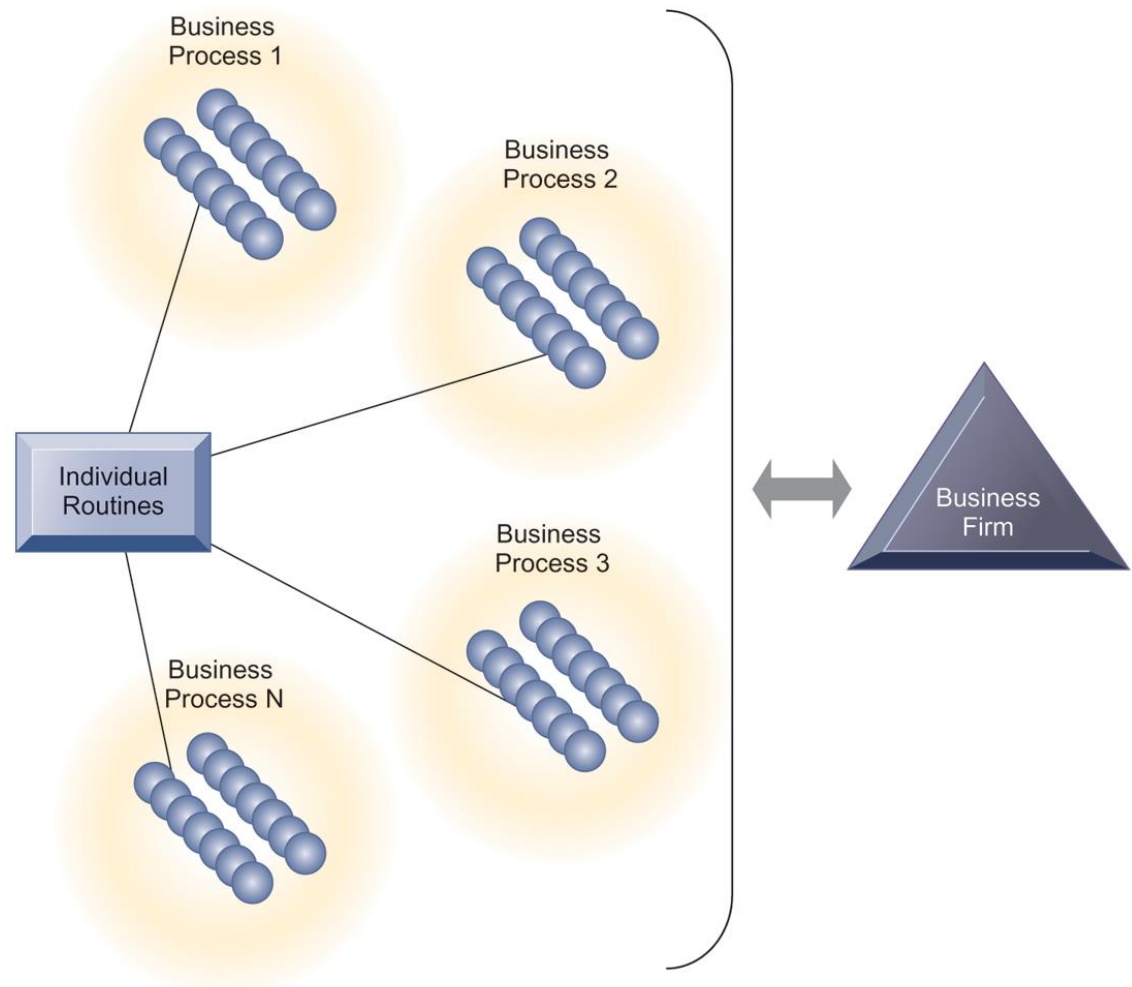# Features of Organizations

- Routines and business processes

  - Routines (**standard operating procedures**)

    - Precise rules, procedures, and practices developed to cope with virtually all expected situations

  - Business processes: Collections of routines

  - Business firm: Collection of business processes

Features of Organizations

- Routines and business processes

  - All organizations become very efficient over time because individuals in the firm develop routines for producing goods and services.

  - As employees learn these routines, they become highly productive and efficient, and the firm is able to reduce its costs over time as efficiency increases.

Features of Organizations

All organizations are composed of individual routines and behaviors, a collection of which make up a business process. A collection of business processes make up the business firm. New information system applications require that individual routines and business processes change to achieve high levels of organizational performance.

Features of Organizations

- Organizational politics
  - People in organizations occupy different positions with different specialties, concerns, and perspectives. As a result, they naturally have divergent viewpoints about how resources, rewards, and punishments should be distributed.
  - Divergent viewpoints lead to political struggle for resources, competition, and conflict.
  - Political resistance is one of the great difficulties of bringing about organizational change—especially the development of new information systems.

Features of Organizations

- Organizational culture:

  - Encompasses set of assumptions that define goal and product

    - What products the organization should produce

    - How and where it should be produced

    - For whom the products should be produced

  - These cultural assumptions are taken totally for granted

Features of Organizations

- Organizational culture:

    - Organizational culture is a powerful unifying force that restrains political conflict and promotes common understanding, agreement on procedures, and common practices.

    - Organizational culture is a powerful restraint on change, especially technological change. Any technological change that threatens commonly held cultural assumptions usually meets a great deal of resistance.

Features of Organizations

- Organizational environments:

    - Organizations reside in environments from which they draw resources and to which they supply goods and services.

    - Organizations and environments have a reciprocal relationship (e.g. Without financial and human resources—people willing to work reliably and consistently for a set wage or revenue from customers—organizations could not exist.)
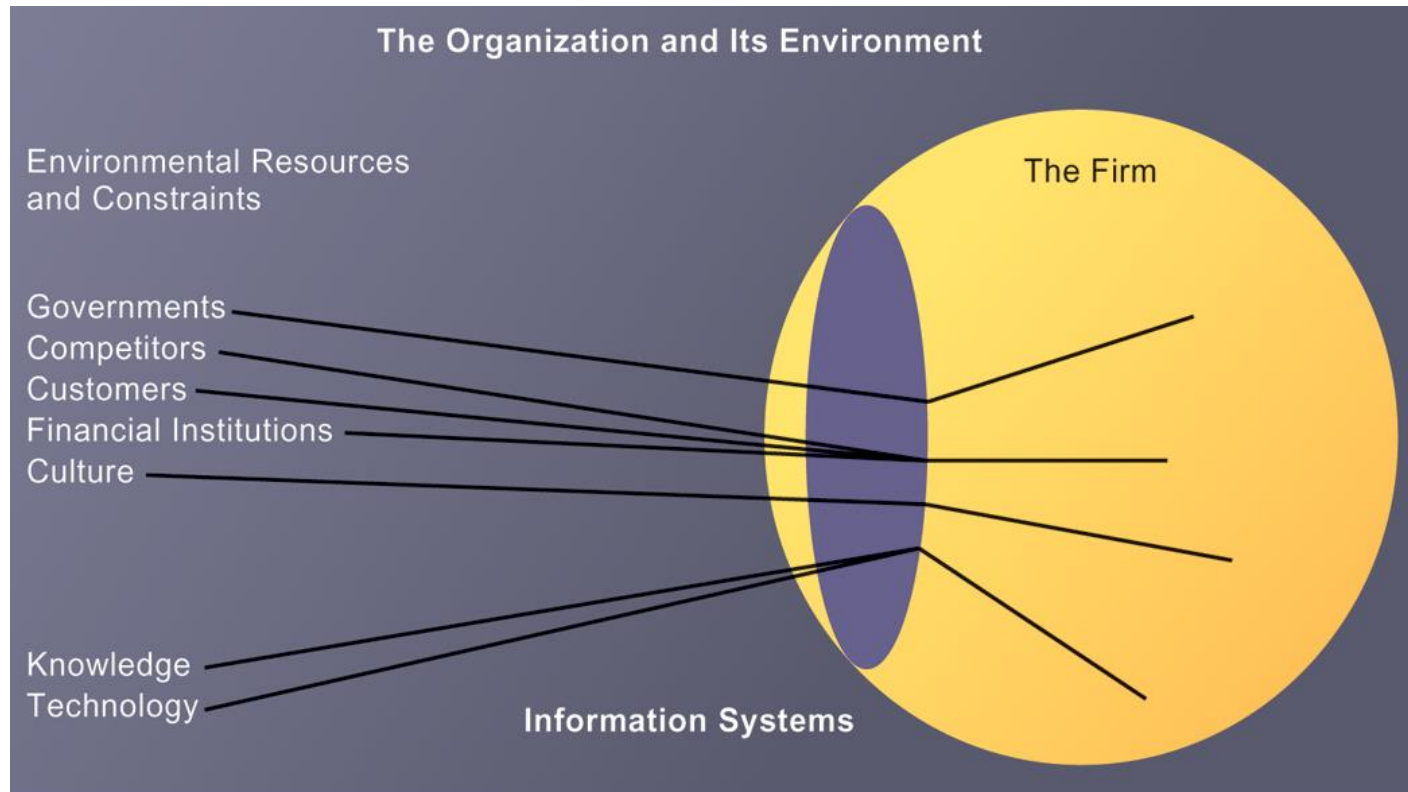
Features of Organizations

- Organizational environments:
    - Organizations are open to, and dependent on, the social and physical environment.
    - Organizations can influence their environments (e.g. business firms form alliances with other businesses to influence the political process; they advertise to influence customer acceptance of their products.)
    - Environments generally change faster than organizations. New technologies, new products, and changing public tastes and values put strains on any organization's culture, politics, and people.

Features of Organizations

- Organizational environments:

  – Information systems can be instrument of *environmental scanning*, act as a lens, helping managers identify external changes that might require an organizational response.

Features of Organizations

The Organization and Its Environment

Environmental Resources and Constraints

Governments
Competitors
Customers
Financial Institutions
Culture

Knowledge
Technology

The Firm

Information Systems

Environments shape what organizations can do, but organizations can influence their environments and decide to change environments altogether. Information technology plays a critical role in helping organizations perceive environmental change and in helping organizations act on their environment.

27

Features of Organizations

- Disruptive technologies
  - A technology and resulting business innovation comes along to radically change the business landscape and environment. These innovations are loosely called "disruptive."

  - In some cases, disruptive technologies are substitute products that perform as well or better (often much better) than anything currently produced.

  - Examples: the Apple iPod for portable CD players; digital photography for process film photography.

Features of Organizations

- Disruptive technologies

  - First movers and fast followers
    - First movers—inventors of disruptive technologies. First movers do not always benefit if they lack the resources to exploit the technology

    - Fast followers—firms with the size and resources to capitalize on that technology

Features of Organizations

Organizational Structure: 5 types

ORGANIZATIONAL TYPE	DESCRIPTION	EXAMPLES
Entrepreneurial structure	Young, small firm in a fast-changing environment. It has a simple structure and is managed by an entrepreneur serving as its single chief executive officer.	Small start-up business
Machine bureaucracy	Large bureaucracy existing in a slowly changing environment, producing standard products. It is dominated by a centralized management team and centralized decision making.	Midsize manufacturing firm
Divisionalized bureaucracy	Combination of multiple machine bureaucracies, each producing a different product or service, all topped by one central headquarters.	Fortune 500 firms, such as General Motors
Professional bureaucracy	Knowledge-based organization where goods and services depend on the expertise and knowledge of professionals. Dominated by department heads with weak centralized authority.	Law firms, school systems, hospitals
Adhocracy	Task force organization that must respond to rapidly changing environments. Consists of large groups of specialists organized into short-lived multidisciplinary teams and has weak central management.	Consulting firms, such as the Rand Corporation

Features of Organizations

- Other organizational features
    - Goals: coercive, utilitarian, normative, and so on
    - Constituencies: serve different groups, some primarily benefiting their members, others benefiting clients, stockholders, or the public.
    - Leadership styles: democratic or authoritarian
    - Tasks: routine tasks that can be reduced to formal rules that require little judgment (such as manufacturing auto parts), whereas others (such as consulting firms) work primarily with nonroutine tasks.

How Information Systems Impact Organizations or Business Firms

- Economic Impact
  - IT changes relative costs of capital and the costs of information
  - Information systems technology is a factor of production, like capital and labor, actually it reduces the need for labor (substitute labor, specially middle managers)
  - IT affects the cost and quality of information and changes economics of information
    - Information technology helps firms reduce transaction costs (the cost of participating in markets)
      - Outsourcing

How Information Systems Impact Organizations or Business Firms

- Economic Impact

  Transaction cost theory

  - Firms seek to economize on transaction costs (the costs of participating in markets).

    – Vertical integration, hiring more employees, buying suppliers and distributors

  - IT lowers market transaction costs for firm, making it worthwhile for firms to transact with other firms rather than grow the number of employees.

How Information Systems Impact Organizations or Business Firms

- Economic Impact

    Transaction cost Impact on Organizations

    - as transaction costs decrease, firm size (the number of employees) should shrink because it becomes easier and cheaper for the firm to contract for the purchase of goods and services in the marketplace rather than to make the product or offer the service itself.

How Information Systems Impact Organizations or Business Firms

- Economic Impact
  - For Example: Information technology, especially the use of networks, can help firms lower the cost of market participation (transaction costs), making it worthwhile for firms to contract with external suppliers instead of using internal sources (outsource operations). As a result, firms can shrink in size (numbers of employees) because it is far less expensive to outsource work to a competitive marketplace rather than hire employees.

How Information Systems Impact Organizations or Business Firms

- Economic Impact

  Agency Problem (Reduce the cost of)

  - Information technology also can reduce internal management costs

  - A principal (owner) employs "agents" (employees) to perform work on his or her behalf. However, agents need constant supervision and management; otherwise, they will tend to pursue their own interests rather than those of the owners.

How Information Systems Impact Organizations or Business Firms

- Economic Impact

  Agency Problem (Reduce the cost of)

  - As firms grow in size and scope, agency costs or coordination costs rise because owners must expend more and more effort supervising and managing employees.

  - IT can reduce agency costs, making it possible for firms to grow without adding to the costs of supervising, and without adding employees (easier to manager or overseas many employees)

How Information Systems Impact Organizations or Business Firms

- ## Organizational and Behavioral Impact

  IT Flattens Organizations

  - Large organizations which primarily developed before the computer age, are often inefficient, slow to change, and less competitive than newly created organizations

  - information technology broaden the distribution of information to empower lower-level employees

  - IT pushes decision-making rights lower in the organization because lower-level employees receive the information they need to make decisions without supervision (Decision making is pushed to lower levels)

  - Fewer managers are needed (IT enables faster decision making and increases span of control).

  - Management span of control has also been broadened, enabling high-level managers to manage and control more workers

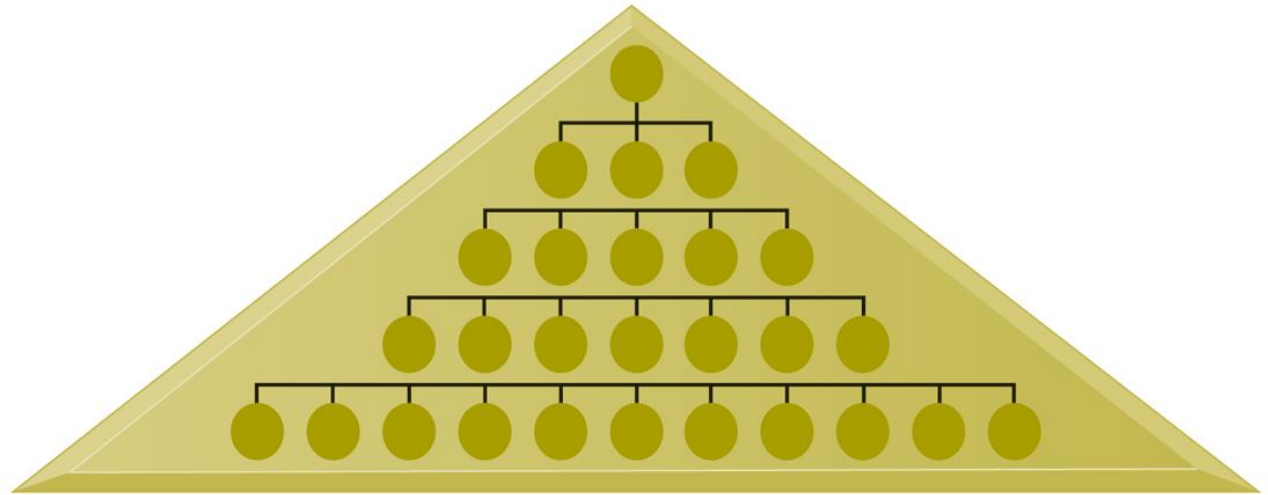# How Information Systems Impact Organizations or Business Firms

- ## Organizational and Behavioral Impact

 Postindustrial Organization

  - Also focus on flattening the organization

  - the shape of organizations flattens because professional workers tend to be self-managing, and

  - decision making should become more decentralized as knowledge and information become more widespread throughout the firm

  - Information technology may encourage task force-networked organizations in which groups of professionals come together—face to face or electronically— for short periods of time to accomplish a specific task.

How Information Systems Impact Organizations or Business Firms

Information systems can reduce the number of levels in an organization by providing managers with information to supervise larger numbers of workers and by giving lower-level employees more decision-making authority.

A traditional hierarchical organization with many levels of management
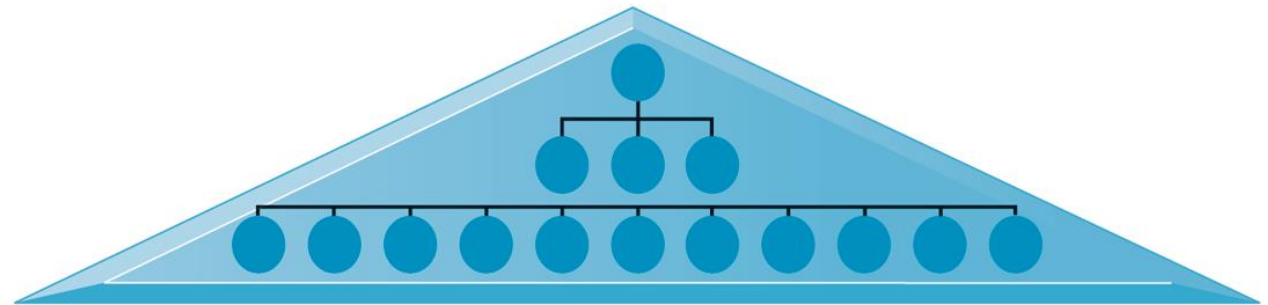
An organization that has been "flattened" by removing layers of management

How Information Systems Impact Organizations or Business Firms

- Organizational Resistance to Change

  - Workers may resist changes that disrupt their routines, why?

  Because:

  - Information systems potentially change an organization's structure, culture, politics, and work.
  - Most common reason for failure of large projects is due to organizational and political resistance to change.

How Information Systems Impact Organizations or Business Firms

Implementing information systems has consequences for task arrangements, structures, and people. According to this model, to implement change, all four components must be changed simultaneously.
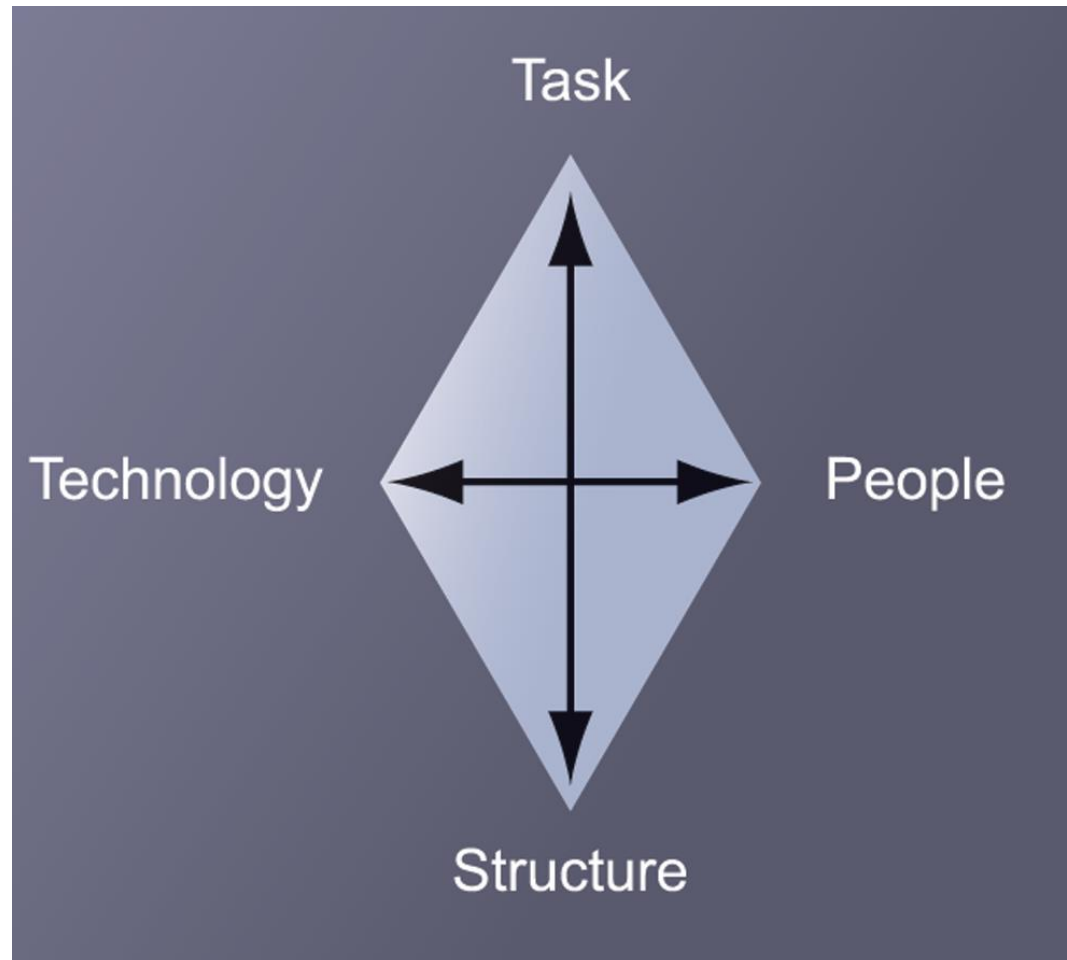
How Information Systems Impact Organizations or Business Firms

- The Internet Impact
  - The Internet increases the accessibility, storage, and distribution of information and knowledge for organizations.
  - The Internet can greatly lower transaction and agency costs.
    - Example: Large firm delivers internal manuals to employees via a corporate Web site, saving millions of dollars in distribution costs

How Information Systems Impact Organizations or Business Firms

- Organizational factors in planning a new system:

    To deliver genuine benefits, information systems must be built with a clear understanding of the organization in which they will be used. Other factors to consider are:
    - Environment
    - Structure
        - Hierarchy, specialization, routines, business processes
    - Culture and politics
    - Type of organization and style of leadership
    - Main interest groups affected by system; attitudes of end users
    - Tasks, decisions, and business processes the system will assist

Information Systems And Competitive Advantage

- Why do some firms become leaders in their industry?

- Michael Porter's competitive forces model
  - Provides general view of firm, its competitors, and environment
  - Five competitive forces shape fate of firm:
    1. Traditional competitors
    2. New market entrants
    3. Substitute products and services
    4. Customers
    5. Suppliers

Information Systems And Competitive Advantage
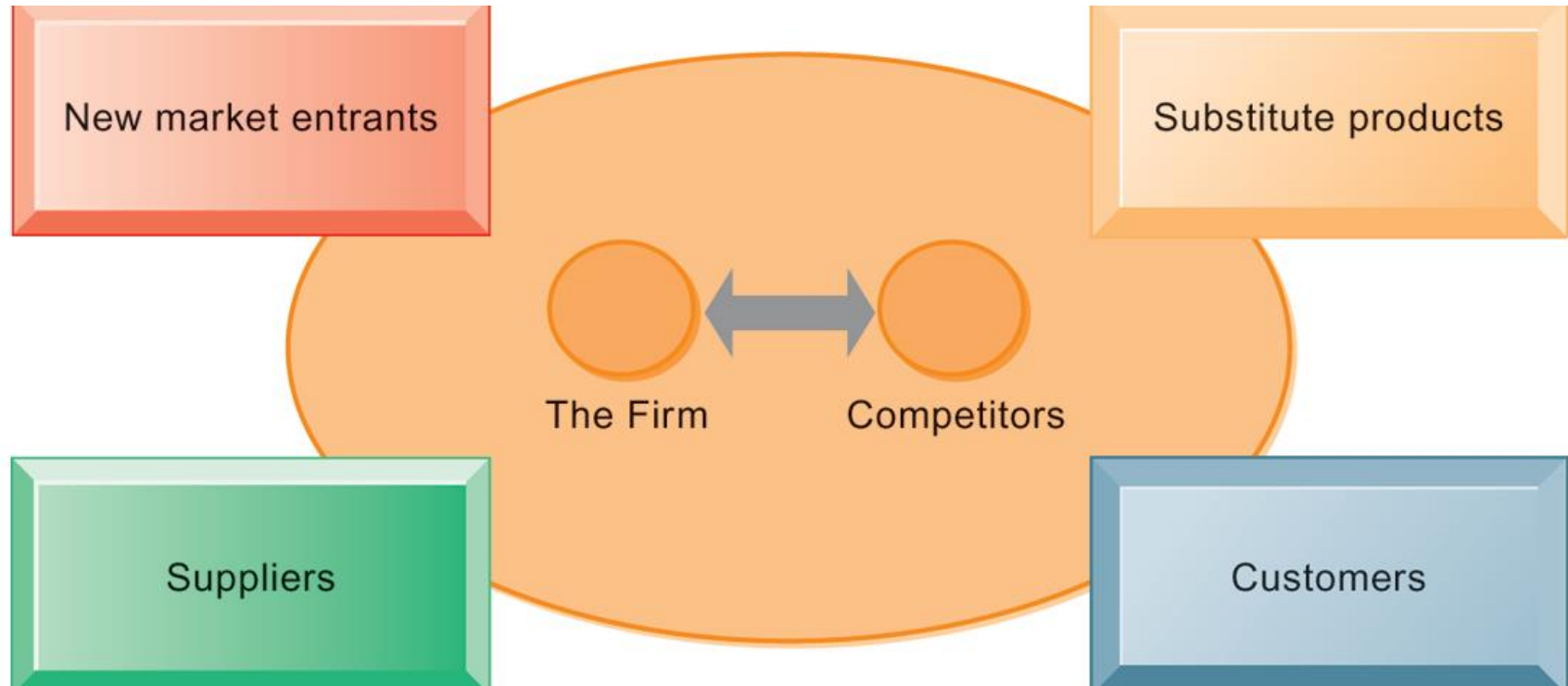
In Porter's competitive forces model, the strategic position of the firm and its strategies are determined not only by competition with its traditional direct competitors but also by four other forces in the industry's environment: new market entrants, substitute products, customers, and suppliers.

Information Systems And Competitive Advantage

- Traditional competitors
  - All firms share market space with competitors who are continuously devising new products, services, efficiencies, and switching costs.

- New market entrants
  - Some industries have high barriers to entry, for example, computer chip business.
  - New companies have new equipment, younger workers, but little brand recognition.

Information Systems And Competitive Advantage

- Substitute products and services
  - Substitutes customers might use if your prices become too high, for example, iTunes substitutes for CDs
- Customers
  - Can customers easily switch to competitor's products? Can they force businesses to compete on price alone in transparent marketplace?
- Suppliers
  - Market power of suppliers when firm cannot raise prices as fast as suppliers

Information Systems And Competitive Advantage

- Four generic strategies for dealing with competitive forces, enabled by using IT:
  - Low-cost leadership
  - Product differentiation
  - Focus on market niche
  - Strengthen customer and supplier intimacy

Information Systems And Competitive Advantage

- Low-cost leadership
  - Produce products and services at a lower price than competitors
  - Example: Walmart's efficient customer response system
- Product differentiation
  - Enable new products or services, greatly change customer convenience and experience
  - Example: Google, Nike, Apple
  - Mass customization

Information Systems And Competitive Advantage

- Focus on market niche
  - Use information systems to enable a focused strategy on a single market niche; specialize
  - Example: Hilton Hotels' OnQ system
- Strengthen customer and supplier intimacy
  - Use information systems to develop strong ties and loyalty with customers and suppliers
  - Increase *switching costs*
  - Example: Netflix, Amazon

Information Systems And Competitive Advantage

- The Internet's impact on competitive advantage
  - The Internet created entirely new markets, formed the basis for new products and business models
  - The internet created threat to some industries
  - Competitive forces still at work, but rivalry more intense
  - Internet technology is based on universal standards that any company can use, making it easy for rivals to compete on price alone and for new competitors to enter the market.
  - New opportunities for building brands and loyal customer bases
  - Because information is available to everyone, the Internet raises the bargaining power of customers, who can quickly find the lowest-cost provider on the Web.

Information Systems And Competitive Advantage

- The Internet's impact on competitive advantage
  - Example: When Apple announced the launch of its new iPad tablet computer, leaders in all of these media saw not only a threat but also a significant opportunity. In fact, the iPad and similar mobile devices may be the savior—if traditional media can strike the right deal with technology providers like Apple and Google. And the iPad may be a threat for companies that fail to adjust their business models to a new method of providing content to users

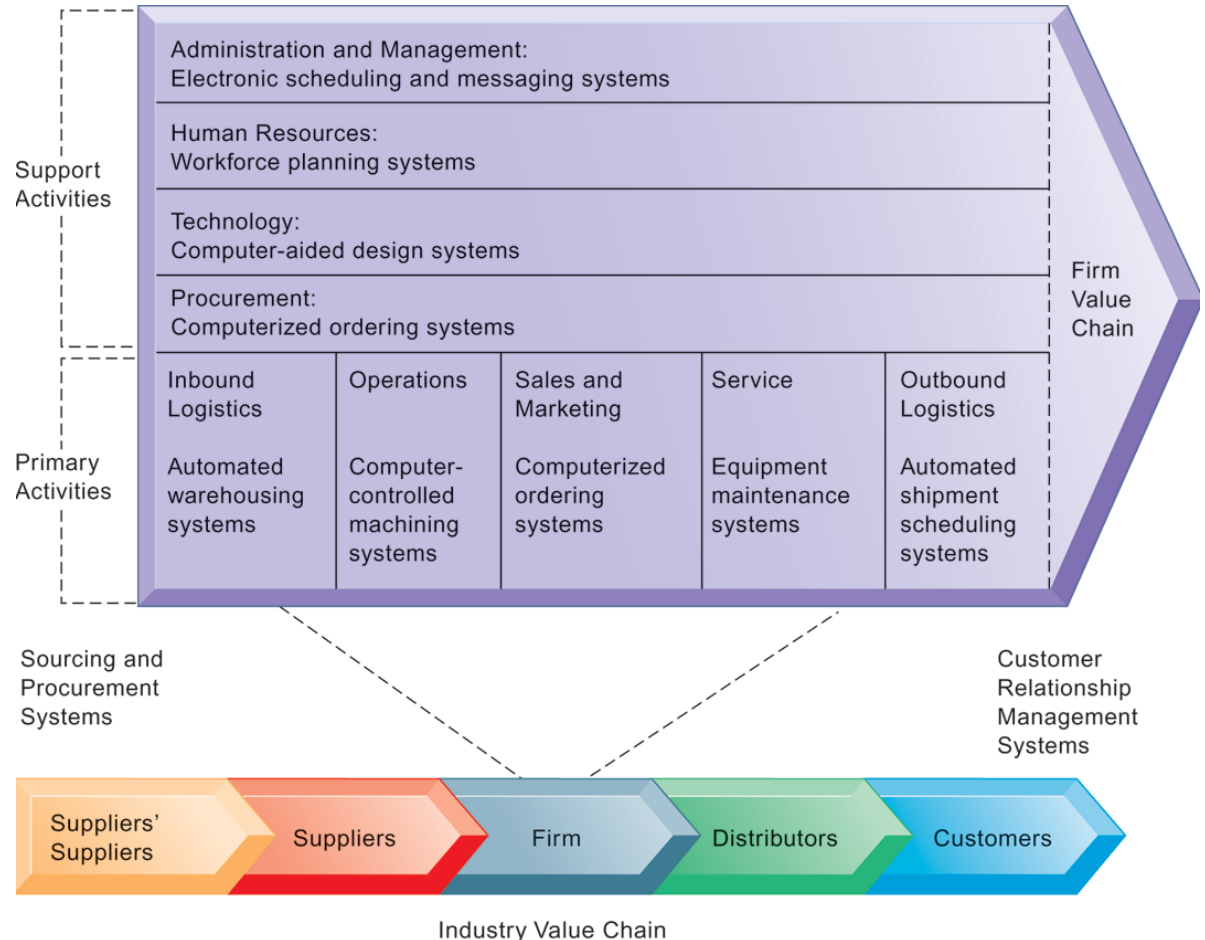# Information Systems And Competitive Advantage

COMPETITIVE FORCE	IMPACT OF THE INTERNET
Substitute products or services	Enables new substitutes to emerge with new approaches to meeting needs and performing functions
Customers' bargaining power	Availability of global price and product information shifts bargaining power to customers
Suppliers' bargaining power	Procurement over the Internet tends to raise bargaining power over suppliers; suppliers can also benefit from reduced barriers to entry and from the elimination of distributors and other intermediaries standing between them and their users
Threat of new entrants	The Internet reduces barriers to entry, such as the need for a sales force, access to channels, and physical assets; it provides a technology for driving business processes that makes other things easier to do
Positioning and rivalry among existing competitors	Widens the geographic market, increasing the number of competitors, and reducing differences among competitors; makes it more difficult to sustain operational advantages; puts pressure to compete on price

Information Systems And Competitive Advantage

- Value chain model
  - Firm as series of activities that add value to products or services
  - Highlights activities where competitive strategies can best be applied
    - Primary activities vs. support activities
  - At each stage, determine how information systems can improve operational efficiency and improve customer and supplier intimacy

Information Systems And Competitive Advantage

This figure provides examples of systems for both primary and support activities of a firm and of its value partners that can add a margin of value to a firm's products or services.
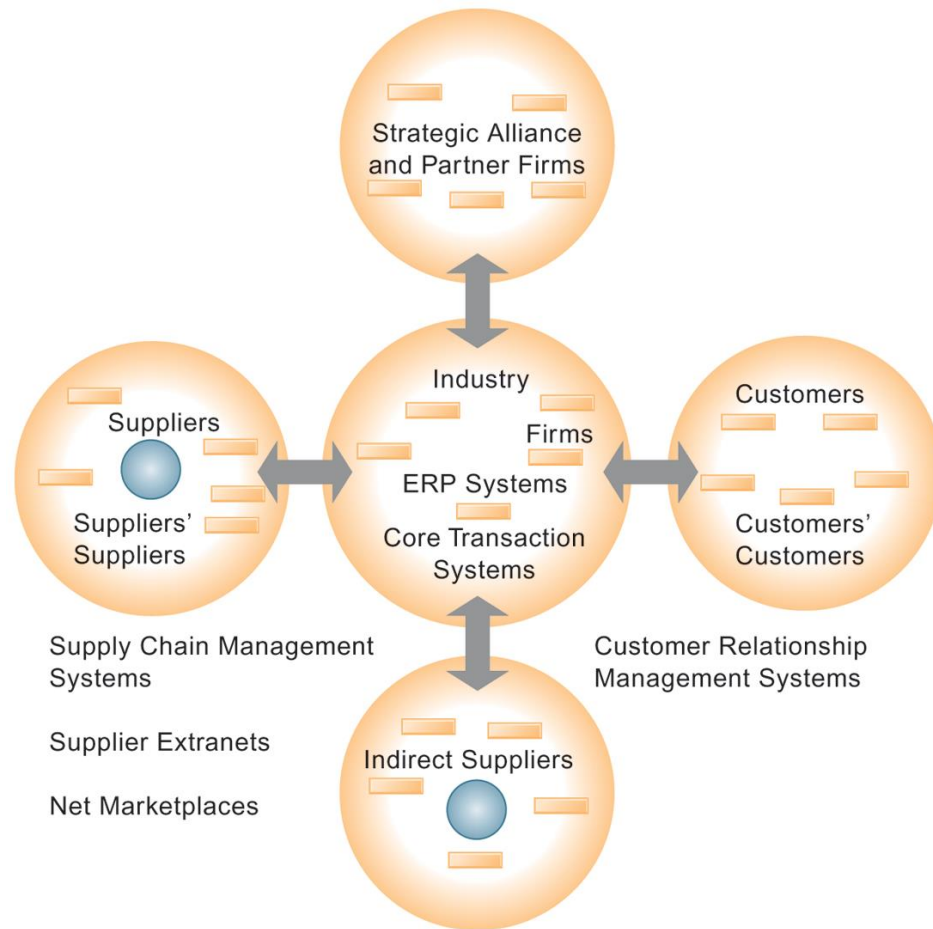
Information Systems And Competitive Advantage

- Extending the value chain: Value web
  - Collection of independent firms using highly synchronized IT to coordinate value chains to produce product or service collectively
  - More customer driven

Information Systems And Competitive Advantage

The value web is a networked system that can synchronize the value chains of business partners within an industry to respond rapidly to changes in supply and demand.

Information Systems And Competitive Advantage

- A large corporation is typically a collection of businesses. Often, the firm is organized financially as a collection of strategic business units and the returns to the firm are directly tied to the performance of all the strategic business units.

- Information systems can improve overall performance of business units by promoting synergies and core competencies

Information Systems And Competitive Advantage

– Synergies

- When output of some units used as inputs to others

- Information technology in these synergy situations ties together the operations of disparate business units so that they can act as a whole.

- Example: merger of Bank of NY and JPMorgan Chase

- Purchase of YouTube by Google

Information Systems And Competitive Advantage

- Core competencies
  - Activity for which firm is world-class leader
  - The argument is that the performance of all business units will increase insofar as these business units develop, or create, a central core of competencies.
  - Relies on knowledge, experience, and sharing this across business units
  - Example: Procter & Gamble's intranet and directory of subject matter experts

Information Systems And Competitive Advantage

- Sustaining competitive advantage
  - Competitors can retaliate and copy strategic systems
  - Systems may become tools for survival

Information Systems And Competitive Advantage

- Managing strategic transitions
  - Adopting the kinds of strategic systems requires changes in business goals, relationships with customers and suppliers, and business processes.
  - These sociotechnical changes, affecting both social and technical elements of the organization, can be considered strategic transitions— a movement between levels of sociotechnical systems.
  - Changes often entail blurring of organizational boundaries, both external and internal. Suppliers and customers must become intimately linked and may share each other's responsibilities.
  - Managers will need to devise new business processes for coordinating their firms' activities with those of customers, suppliers, and other organizations.

Source:

>> Management Information Systems, Managing the Digital Firm, 13 Edition (2014), Laudon and Laudon.