Lesson 3 – Information Systems, Organizations, and Strategy

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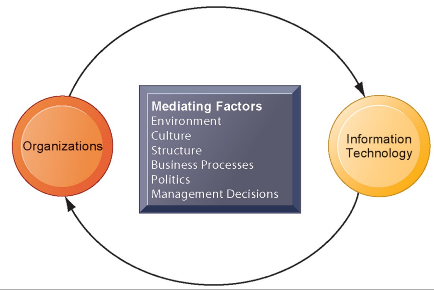
Source:
Laudon, K. and Laudon, J., 2016,
Management Information Systems: Managing the Digital Firm,
Thirteenth Edition, Prentice Hall

Organizations and Information Systems

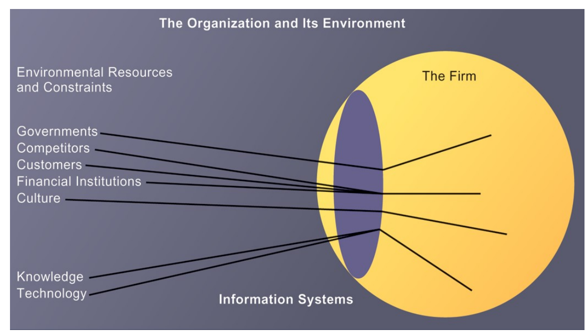
- Information technology and organizations influence each other



Organizational Environments

- Organizations and environments have a reciprocal relationship.
- Organizations are open to, and dependent on, the social and physical environment.
- Organizations can influence their environments.
- Environments generally change faster than organizations.
- Information systems can be an instrument of *environmental scanning*, act as a lens.

Organizational Environments



Disruptive Technologies

Disruptive Technologies

- Technology that brings about drastic change to businesses, industries, markets
- *Examples:*
  - Personal computers, word processing software, the Internet, the PageRank algorithm
- First movers and fast followers
  - First movers—inventors of disruptive technologies
  - Fast followers—firms with the size and resources to capitalize on that technology

Disruptive Technologies

TECHNOLOGY	WINNERS AND LOSERS
Microprocessor chips (1971)	Microprocessor firms win (Intel, Texas Instruments) while transistor firms (GE) decline.
Personal computers (1975)	PC manufacturers (HP, Apple, IBM), and chip manufacturers prosper (Intel), while mainframe (IBM) and minicomputer (DEC) firms lose.
PC word processing software (1979)	PC and software manufacturers (Microsoft, HP, Apple) prosper, while the typewriter industry disappears.
PageRank algorithm	Google is the winner (they own the patent), while traditional key word search engines (Alta Vista) lose.
World Wide Web (1989)	Owners of online content, news benefit while traditional publishers (newspapers, magazines, and broadcast television) lose.
Software as Web service	Online software services companies (Salesforce.com) win, while traditional "boxed" software companies (Microsoft, SAP, Oracle) lose.

The Impact of Information Systems on Organizations

- Economic impacts
  - IT changes relative costs of capital and the costs of information
  - Information systems technology is a factor of production, like capital and labor
  - As the cost of information technology decreases, it also substitutes for other forms of capital such as buildings and machinery, which remain relatively expensive

The Impact of Information Systems on Organizations

- Economic impacts: Transaction cost theory
  - Transaction costs – the costs incurred when a firm buys on the marketplace what it cannot make itself.
    - Locating and communicating with distant suppliers, monitoring contract compliance, buying insurance, obtaining information on products, etc.
  - Firms seek to economize on transaction costs.
    - Traditional methods: Vertical integration, hiring more employees, buying suppliers and distributors
  - IT lowers market transaction costs for the firm, making it worthwhile for firms to transact with other firms rather than grow the number of employees.

The Impact of Information Systems on Organizations

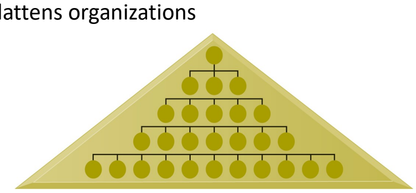
- Economic impacts: Agency theory
  - A firm is a nexus of contracts among self-interested parties.
  - A principal (owner) employs "agents" (employees) to perform work on his or her behalf.
  - Agents need constant supervision and management.
  - Firms experience agency costs (the cost of managing and supervising) which rise as the firm grows.
  - IT can reduce agency costs (by reducing the costs of acquiring and analyzing information), making it possible for firms to grow without adding to the costs of supervising, and without adding employees.

The Impact of Information Systems on Organizations

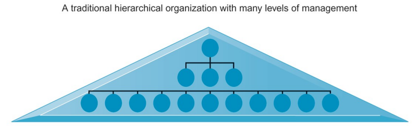
- IT flattens organizations
  - Decision making is pushed to lower levels.
  - Fewer managers are needed (IT enables faster decision making and increases span of control).
  - Organizations flatten because authority increasingly relies on knowledge and competence rather than formal positions.

The Impact of Information Systems on Organizations

- IT flattens organizations



A traditional hierarchical organization with many levels of management



An organization that has been "flattened" by removing layers of management

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The Impact of Information Systems on Organizations

- Organizational resistance to change
  - Information systems become bound up in organizational politics because they influence access to a key resource—information.
  - 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.

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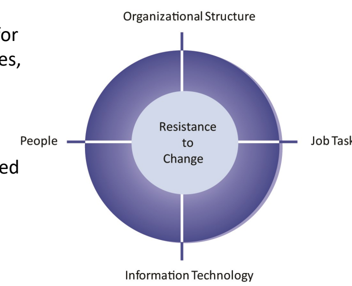
The Impact of Information Systems on Organizations

- 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.



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The Impact of Information Systems on Organizations

- **The Internet and organizations**
  - 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

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The Impact of Information Systems on Organizations

- Organizational factors in planning a new system:
  - Environment
  - Structure
    - Hierarchy, specialization, routines, business processes
  - Culture and politics
  - Type of organization and style of leadership
  - Main interest groups affected by the system; attitudes of end users
  - Tasks, decisions, and business processes the system will assist

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Using Information Systems to Develop Competitive Strategies

- Why do some firms become leaders in their industry?
- e.g.
  - Automotive industry: Toyota
  - Pure online retail: Amazon
  - Offline retail: Walmart
  - Online music: Apple iTunes
  - Web search: Google

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Using Information Systems to Develop Competitive Strategies

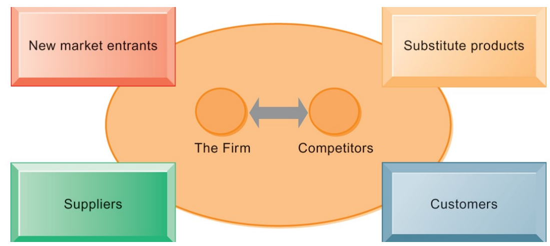
- Firms that "do better" than others are said to have a competitive advantage over others. They,
  - have access to special resources that others do not, or
  - are able to use commonly available resources more efficiently
  - do better in terms of revenue growth, profitability, or productivity growth (efficiency)

Using Information Systems to Develop Competitive Strategies

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

Using Information Systems to Develop Competitive Strategies

- Michael Porter's competitive forces model



Using Information Systems to Develop Competitive Strategies

- 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.

Using Information Systems to Develop Competitive Strategies

- 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 a transparent marketplace?
- Suppliers
  - Market power of suppliers increases when a firm cannot raise prices as fast as suppliers

Using Information Systems to Develop Competitive Strategies

- 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

Using Information Systems to Develop Competitive Strategies

- Low-cost leadership
  - Produce products and services at a lower price than competitors
  - Use information systems to achieve the lowest operational costs and the lowest prices.
  - Example: Walmart's continuous replenishment system
    - Efficient customer response system: directly links consumer behavior to distribution and production and supply chains.

Using Information Systems to Develop Competitive Strategies

- Product differentiation
  - Enable new products or services
  - Greatly change customer convenience and experience in using existing products and services
  - *Example:* Google, Apple
  - Mass customization: Ability to offer individually tailored products or services using the same production resources as mass production
  - *Example:* Nike

Using Information Systems to Develop Competitive Strategies

- Focus on market niche
  - Use information systems to enable a focused strategy on a single market niche; specialize.
  - Information systems support this strategy by producing and analyzing data for finely tuned sales and marketing techniques.
  - *Example:* Credit card companies can predict their most profitable cardholders.

Using Information Systems to Develop Competitive Strategies

- Strengthen customer and supplier intimacy
  - Use information systems to develop strong ties and loyalty with customers and suppliers
  - Increase switching costs
  - *Example:* Chrysler Corporation uses information systems to facilitate direct access by suppliers to production schedules; Amazon keeps track of user preferences for purchases

Discussion

- You are advising the owner of "Smalltown Computer", a new, local computer repair store that also builds custom computers to order.
  - What competitive strategies could Smalltown Computer exert?
  - Which ones will it have difficulty exercising?

Using Information Systems to Develop Competitive Strategies

- The Internet's impact on competitive advantage
  - Transformation or threat to some industries
    - *Examples:* printed encyclopedia, media
  - Competitive forces still at work, but rivalry more intense
  - Universal standards allow new rivals, entrants to market
  - New opportunities for building brands and loyal customer bases

Using Information Systems to Develop Competitive Strategies

- The Internet's impact on competitive advantage

COMPETITIVE FORCE	IMPACT OF THE INTERNET
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
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

Using Information Systems to Develop Competitive Strategies

- The Internet's impact on competitive advantage

COMPETITIVE FORCE	IMPACT OF THE INTERNET
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

Using Information Systems to Develop Competitive Strategies

- Value chain model
  - Also introduced by Michael Porter
  - Views the firm as a series of activities that add value to products or services
  - Highlights activities where competitive strategies can best be applied

Using Information Systems to Develop Competitive Strategies

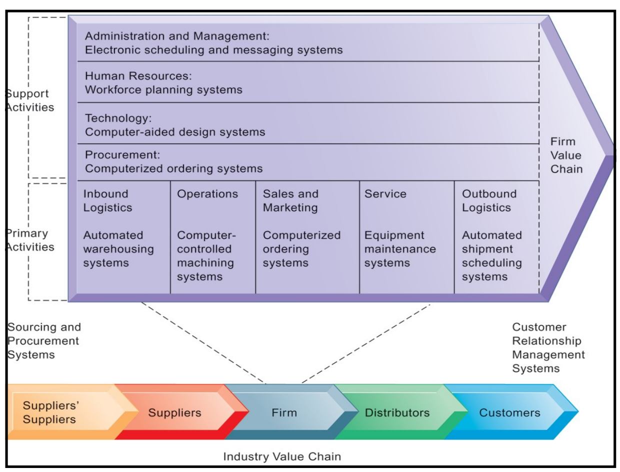
- Value chain model
  - **Primary activities** are most directly related to the production and distribution of the firm's products and services, which create value for the customer.
    - Inbound logistics
    - Operations
    - Outbound logistics
    - Sales and marketing
    - Service

Using Information Systems to Develop Competitive Strategies

- Value chain model
  - **Support activities** make the delivery of the primary activities possible.
    - Organization infrastructure (administration and management)
    - Human resources (employee recruiting, hiring, and training)
    - Technology (improving products and the production process)
    - Procurement (purchasing input)

Using Information Systems to Develop Competitive Strategies

- Value chain model
  - At each stage, determine how information systems can improve operational efficiency and improve customer and supplier intimacy
  - Critically examine how value-adding activities at each stage are performed and how the business processes might be improved.
  - Utilize benchmarking, industry best practices

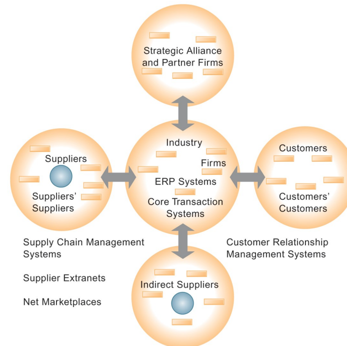


Using Information Systems to Develop Competitive Strategies

- Value web:
  - Collection of independent firms using highly synchronized IT to coordinate value chains to produce a product or service collectively
  - More customer driven, less linear operation than traditional value chain
  - A value web is flexible and adapts to changes in supply and demand and changing market conditions
  - *Example:* Ford Motor Company

Using Information Systems to Develop Competitive Strategies

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.



Using Information Systems to Develop Competitive Strategies

- Information systems can improve overall performance of business units by promoting synergies and core competencies
  - **Synergies**
    - When output of some units are used as inputs to others, or organizations pool markets and expertise
    - These relationships lower costs and generate profits.
    - *Example:* Purchase of YouTube by Google

Using Information Systems to Develop Competitive Strategies

- Core competencies
  - Activity for which a firm is a world-class leader
  - Relies on knowledge, experience, and sharing this across business units
  - Examples:
    - Google: search, Intel: processors
    - Proctor & Gamble's intranet called InnovationNet helps people working on similar problems share ideas and expertise.

Discussion

- How is the concept of core competency relevant to Smalltown Computer, a local computer repair store that builds custom computers? Give examples

Using Information Systems to Develop Competitive Strategies

- Network-based strategies
  - Take advantage of firm's abilities to network with one another
  - Include use of:
    - Network economics
    - Virtual company model
    - Business ecosystems

Using Information Systems to Develop Competitive Strategies

- Traditional economics: Law of diminishing returns
  - The more any given resource is applied to production, the lower the marginal gain in output, until a point is reached where the additional inputs produce no additional outputs
- Network economics:
  - Marginal cost of adding new participant almost zero, with much greater marginal gain
  - Value of community grows with size
  - Value of software grows as installed customer base grows

Using Information Systems to Develop Competitive Strategies

- Virtual company strategy
  - Virtual company uses networks to ally with other companies to create and distribute products without being limited by traditional organizational boundaries or physical locations
  - Companies like this are “virtual” because they do not actually own any factories, machines, or other similar infrastructure.

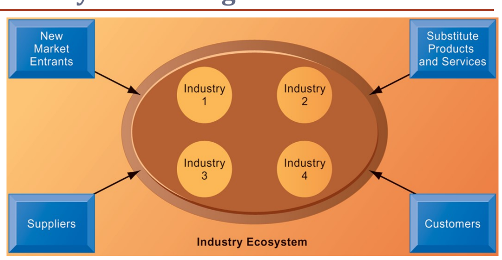
Using Information Systems to Develop Competitive Strategies

- Virtual company strategy (cont.)
  - Instead, they offer a series of services, aided by information systems and uninhibited by geographical boundaries.
  - *Example:* Fashion companies, such as *Levi Strauss* and *Reebok*, enlist Hong Kong-based *Li & Fung* to manage production and shipment of their garments.

Using Information Systems to Develop Competitive Strategies

- Business ecosystems
  - Industry sets of firms providing related services and products
    - Microsoft platform used by thousands of firms
    - Walmart’s order entry and inventory management
    - Mobile Internet platform
  - **Keystone firms:** Dominate ecosystem and create platform used by other firms
  - **Niche firms:** Rely on platform developed by keystone firm
  - Individual firms can consider how IT will help them become profitable niche players in larger ecosystems

An Ecosystem Strategic Model



In the ecosystem model, multiple industries work together to deliver value to the customer. IT plays an important role in enabling a dense network of interactions among the participating firms.

Using Information Systems to Develop Competitive Strategies: Management Issues

- Sustaining competitive advantage
  - Competitors can retaliate and copy strategic systems
  - Systems may become tools for survival
- Aligning IT with business objectives
  - Performing strategic systems analysis
    - Structure of industry
    - Firm value chains
- Managing strategic transitions
  - Adopting strategic systems requires changes in business goals, relationships with customers and suppliers, and business processes