

Production Planning and Control

MANAGEMENT INFORMATION SYSTEM

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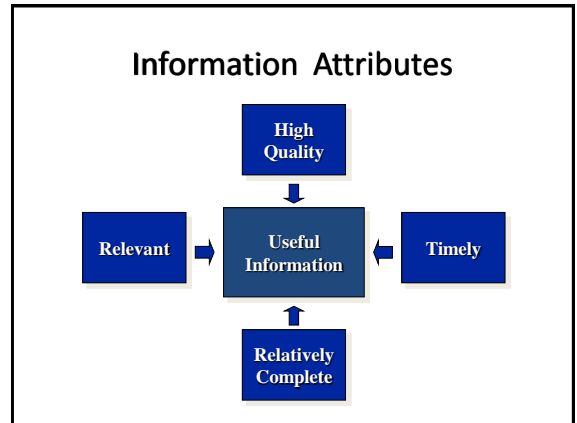
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Information and the Manager

- Data: raw facts such as the number of customers.
- Information: data arranged in a meaningful fashion. Good information possesses these attributes:
 - **Information Quality:** measures information accuracy and reliability.
 - **Timeliness:** information is needed when managerial action is taken.
 - Real Time Information: reflects the current condition.
 - **Completeness:** manager has the information to act.
 - **Relevance:** information matches the managers specific needs at hand.
 - Irrelevant information does not apply



(IT) Information Technology

- The process and applications that create new methods to:
 - Solve problems
 - Perform tasks
 - Manage communication

Information Systems & Technology

- **Information System:** acquires, organizes, stores, manipulates and transmits information.
 - A **Management Information System** is the plan and design of an Information System to provide managers with information.
 - Can be paper or computer-based.
 - **Information technology:** is the means for acquiring, organizing, storing, manipulating, and transmitting information.
 - Information technology power has increased rapidly.
 - **Information and Decisions:** managing has to do with making decisions.
 - Good Information allows effective decision making.

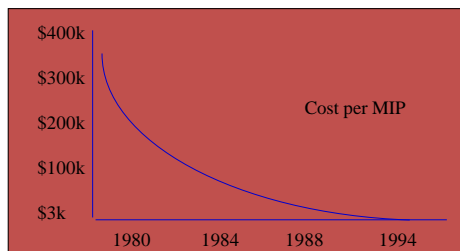
Using Information

- **Information and control:** control allows managers to regulate the efficiency and effectiveness of the organization.
 - Effective control requires good information.
 - Information technology in the form of computers allows managers quick access to information.
 - **Information and Coordination:** managers must coordinate departmental actions to achieve goals.
 - Information Systems provide information on suppliers, production schedules, and orders to allow coordination.

Information Technology Revolution

- **Information Technology** began with early computers.
 - Computers are called **hardware** and use digital 1's and 0's to represent data.
 - Modern computers use **microprocessors** such as the Pentium to access information.
- Computer **cost has dropped** dramatically while the power of computers has risen.
 - Computers cost less and do more than ever before.
 - Connecting one computer to another is also much easier and cheaper.

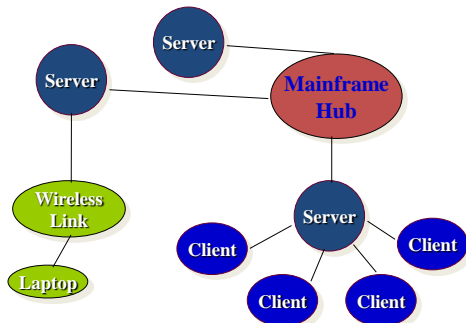
Price Performance Ratio of Computers



Computer Communications

- **Wireless communications:** connects managers and computers together without wires.
 - Cellular has grown rapidly to over 20 million users.
 - Wireless modems connect one computer to another.
- **Networks:** share information between computers.
 - **Server Computer:** powerful computer that relays information to client computers.
 - Servers and other computers are connected on a Local Area Network or LAN
 - **Mainframe:** large computers processing vast amounts of information.
 - **Internet:** a world wide network of computers.

3 Tier Information System



Software Developments

- **Operating system software:** tells the computer how to run itself.
- **Applications software:** provide for functions such as word processing, spreadsheets, and graphics.
 - The new software provides far better access to information for managers.
- **Artificial Intelligence:** behavior by a machine that can be called intelligent.
 - Computers evaluate problems & act on simple tasks.
- **Speech Recognition:** allow a computer to hear and act on spoken commands.
 - Powerful programs are still being developed.

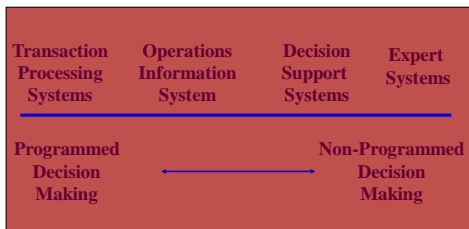
Types of Information Systems

- **Transaction Processing Systems (TPS):** designed to handle large volumes of routine transactions.
 - The first **computer-based Information System**.
 - Billing, payroll, supplier payments are examples.
- **Operations Information Systems (OIS):** gathers comprehensive data, organizes it and summarizes it in a form valuable to managers.
 - Can help managers with non-routine decisions such as customer service and productivity.
 - Provides sales, inventory & performance oriented data.

Types of Information Systems

- **Decision Support Systems (DSS):** provides interactive models to help managers make better decisions.
 - Excellent for unusual, **non-programmed** decisions
 - Analyzes investment potential, new product pricing.
 - Often used by middle and upper managers.
- **Executive Support System (ESS):** sophisticated version of a DSS to match top manager's needs.
 - Focus on user friendly features.
- **Expert Systems:** employees human knowledge captured in a computer to solve problems usually requiring human insight.
 - Use **Artificial Intelligence** to recognize, formulate, solve problems, and learn from experience.

Types of Information Systems



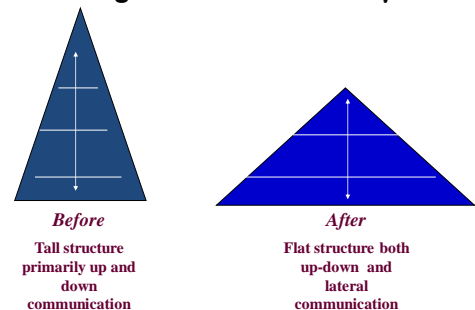
Information Systems Impacts

- Information Systems have provided managers with better information, enabling better decision making.
 - Effective Information Systems can be a source of competitive advantage.
- Computer-based information systems are associated with decentralization of managerial decision making.
 - **Flattening the Organization:** information systems reduce the need for the hierarchy to control the firm.
 - Managers control and coordinate using the system, not workers.

Information Systems Impacts

- **Horizontal Information Flows:** Information networks can bridge functional departments.
 - Allow information to flow horizontally between departments.
 - Can lead to much higher productivity, quality, and innovation.
- **Virtual products:** firms can use their information system to custom tailor goods and services to each customer.
 - Systems can allow this at no increase in cost.

Information Systems Impact on Organizational Hierarchy



Barriers to Information Systems

- **Technological factors:** consistent standards for systems do not exist.
 - Makers of hardware use different standards.
 - Makes it hard to share information between systems.
- **Resistance by Individuals:** many managers do not use the system fully.
 - Some managers are afraid of technology or do not understand it.
- **Political Resistance:** the information system changes the way information flows in the firm
 - Some managers feel threatened by it.
 - Managers may think they will be laid-off.

Limitations to Information Systems

- **Loss of the human element:** information systems cannot present all kinds of information accurately.
 - **Thick information**, which is rich in meaning and not quantifiable, is best suited to human analysis.
 - Example: employee evaluations need face-to-face communication to convey all information.
- **Difficult installations:** Information systems can be hard to develop.
 - To avoid problems:
 - list major organization goals.
 - build support for the system with workers.
 - create formal training programs.
 - emphasize that face-to-face contact is important.

The Role and Impact of Technology in the Economy

- Increase intellectual knowledge
- Achieve business objectives
- Advancement of economic systems
- Improving the quality of life

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The Impact of Technology on Consumers

- Technology changes the way consumers:
 - Plan and take vacations
 - Make purchases
 - Drive cars
 - Obtain entertainment



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The Impact of Technology on the Workplace

- Technology has:
 - Improved productivity
 - Improved efficiency
 - Reduced costs
 - Enhanced customer service



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The Biggest Technology Challenge for Business

- Keeping pace with new information technology in new competitive environments



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IT Improves Global Access

- Global markets and foreign business professionals are now linked through telecommunication
 - Productivity has doubled in the last 10 years through “real time” access to people and markets

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Managing Information

- Data:
 - Numerical or verbal descriptions related to statistics or other items that have not been analyzed or summarized
- Knowledge:
 - An understanding of data gained through study or experience
- Information:
 - Data and knowledge that can be used in making decisions

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Management Information Systems

- MIS
 - Used for organizing and transmitting data into information that can be used in decision making
 - Breaks down time and location barriers
 - Wireless communications
 - Computers, personal data assistants, cell phones, pagers, and GPS positioning devices found in cars

Source: Spencer F. Hale, Amy Barrus, and Robert D. Hoff, “In Search of the Net’s Next Big Thing,” *Business Week*, March 26, 2001, p. 141.

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Collecting Data

- To be effective, an MIS must be able to:
 - Collect data
 - Store data
 - Update data
 - Process data
 - Present information



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Database

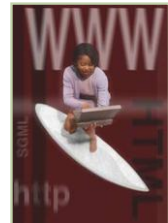
- A collection of data stored in one place and accessible throughout the network



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The Internet and the World Wide Web

- Internet:
 - A global information system that links many computer networks together
- World Wide Web (www)
 - A collection of interconnected web sites or pages of text, graphics, audio, and video within the Internet



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Intranets and Extranets

- Intranet:
 - A computer network similar to the Internet
 - Only available to people inside an organization
- Extranet:
 - A network of computers that permits selected companies and other organizations to access the same information
 - May allow collaboration and communication about the information

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How the Internet Works

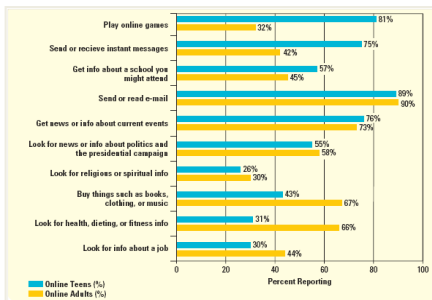
- Internet Service Provider (ISP)
 - Provides access to the Internet through its own series of local networks

Did You Know?

70% of consumers use narrowband to access the Internet at home. Broadband works 50 times faster than a traditional telephone modem

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Leading Internet Activities



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Source: Sean Michael Kenes, "Teen Use of Web, Online Technologies Growing," Pew Internet & American Life Project, July 27, 2005, www.clickz.com/stats/sectors/demographics/print.php?ID=2319 (accessed April 7, 2006).

Internet Use, by Selected Country

Country	Users (in millions)	Estimated Percentage of the Population
Australia	13.01	69.8
United States	185.55	63.0
Canada	20.45	62.3
Japan	78.05	61.0
United Kingdom	33.11	55.0
Germany	47.12	57.0
Israel	3.13	50.0
Chile	5.04	31.5
Russia	22.3	15.0
Mexico	13.88	13.0
Argentina	4.65	11.8
South Africa	4.78	11.0
China	99.8	7.6
India	38.5	4.0
Iraq	0.0125	0.04

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Source: "Population Explosion!" ClickZ, November 3, 2005, www.clickz.com/stats/geographic/article.php?ID=15151 (accessed February 20, 2006).

Internet Users

- Internet users worldwide in 2006
 - More than 1.086 billion
- Expected growth rate
 - Asian-speaking countries (34.6 percent)
 - English-speaking countries (27.2 percent)
 - The European nations (23.8 percent)
- Usage growth between 2000 and 2006
 - 200.9%
- Internet usage penetration in the U.S. is 69.3%

Did You Know?

About 8.7 billion e-mails are sent each day in the US and Canada

Source: Internet Usage Statistics - "The Big Picture" <http://www.internetusagestats.com/index.htm> (accessed October 31st 2006)

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Internet Users

- Women
 - 52 percent in the United States
 - 42 percent in Europe
- Children
 - One-fifth of American Internet users are between the ages of 2 and 17
- Seniors
 - The fastest growing group of Internet users

Did You Know?

The first Internet users were male, young, college-educated, and resided in the United States

Internet Uses

- Communication
- Information
- Entertainment
- E-business



Did You Know?

Every day, 600,000 illegal copies of movies are downloaded from the Internet.

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Emerging Technologies

- Cellular
 - The dominant technology for voice communications
- Wireless fidelity (Wi-Fi) networks
 - In the near future, experts expect Wi-Fi to link all sorts of device (i.e., lamps, stereos, appliances)
- Wireless mesh networks
 - Eliminates centralized failure
- Radio Frequency Identification (RFID) systems
 - Use radio waves to identify and track resources and products within the distribution channel

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Uses for Digital Marketing

A survey of more than 400 marketing decision-makers in North America found that digital marketing is being used for a variety of purposes.

Purpose of Digital Marketing	Percent of Companies
New customer lead generation	85%
Brand awareness and recognition	71%
Improved customer relationships	68%
Cross-sell and up-sell to existing customers	61%
Web site traffic generation	60%
Customer education	54%
Customer support	47%
Event promotion	45%
Product sales	42%

Source: Greenspan, Robyn, "E-Marketing Efforts Leave Room for Improvement," Clickz.com, February 6, 2004, available at http://www.clickz.com/stats/markets/advertising/print.php/5941_3309721.

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The Nature of E-Business

- E-business (E-commerce) utilizes the Internet to carry out marketing activities
 - These activities include communicating and fostering exchanges and relationships with customers, suppliers, and the public
 - Reduces the costs of business and customer transactions
 - Restructures the way work is done

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Top Seven Reasons For Buying Online

1. Save time by not going to store
2. Can shop when stores are closed
3. Avoid crowds
4. Might be able to find better prices
5. Can find products online more easily
6. Find products not available in stores
7. Easier to compare prices

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Source: Greenspan, Robyn, "E-Marketing Efforts Leave Room for Improvement," Clickz.com, February 6, 2004, available at http://www.clickz.com/stats/markets/advertising/print.php/6061_3105491.

E-Commerce by Ethnicity

A study by The Media Audit surveyed 86 major U.S. markets and found that while relatively low in numbers, the U.S. Asian population has a strong presence in e-commerce. The table below summarizes the percentages of different ethnic groups making online purchases per year.

Group	1+Purchases/Year	5+Purchases/Year
	ar	r
White	45%	26%
African-American	27%	12%
Hispanic	28%	14%
Asian	56%	31%
Total of all groups	41%	23%

Source: Greenspan, Robyn, "E-Marketing Efforts Leave Room for Improvement," Clickz.com, February 6, 2004, available at <http://www.clickz.com/stats/markets/advertising/print.php/3329041>.

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E-Business Models

- Business-to-Business (B-to-B)
 - Use of the Internet for transactions and communications between organizations
- Business-to-Consumer
 - Delivery of products and services directly to individual consumers through the Internet
- Consumer-to-Consumer
 - Market in which consumers market goods and services to each other through the Internet

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Customer Relationship Management

- CRM focuses on using information about customers to create strategies that develop and sustain desirable long-term customer relationships



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Legal and Social Issues of IT and E-Business

- Privacy
- Identity Theft
- Protection of Intellectual Property
- Protection of Copyrights

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Privacy

- Privacy has become one of Web users' biggest concerns
- Many sites follow users' online *tracks* by storing a **cookie** on their computers
 - Cookies permit Web site operators to track a user
 - The potential for misuse has left many consumers uncomfortable with this technology



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Spam

- Unsolicited commercial e-mail (UCE) has become a major source of discontent with the Internet
 - Many Internet users believe spam violates their privacy and steals their resources
 - Many companies despise spam because it costs them \$10 billion a year in lost productivity, new equipment, anti-spam filters, and manpower
 - Spam accounts for more than 50 percent of corporate-mail

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Common Reactions to Spam

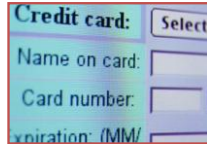
Action	Percent Reporting
Deleted without opening	86
Clicked "remove me"	67
Clicked to get more information	33
Reported to e-mail provider	21
Ordered product	7
Reported to consumer or government agency	7
Provided requested personal information	4
Gave money in response	1

Source: Pew Internet & American Life Project, in Robyn Greenspan, "Spam: Always Annoying, Often Offensive," CyberAtlas, October 22, 2003, http://cyberatlas.internet.com/big_picture/applications/article/0,1301_3087391_00.html.

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Identity Theft

- Criminals obtain personal information that allows them to impersonate someone else to use their credit
 - Obtain financial accounts
 - Make purchases



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Most Common Complaints Related to Identity Theft

- Credit card fraud
- Utility fraud
- Bank fraud
- Employment-related fraud
- Government document fraud
- Loan fraud

Federal Trade Commission, "National and State Trends in Fraud and Identity Theft," *Consumer Sentinel*, January 22, 2004, available at www.consumer.gov/sentinel/pubs/Top10Fraud.pdf.

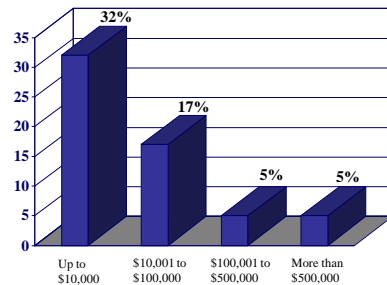
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Intellectual Property and Copyrights

- *Intellectual property* consists of the ideas and creative materials developed to solve problems, carry out applications, and educate
 - Generally protected via patents and copyrights
- *Copyright* infringement is the unauthorized execution of the rights reserved by a copyright holder
 - The Digital Millennium Copyright Act (DMCA) protects copyrighted materials on the Internet

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Financial Costs of Cyberattacks



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Source: USA Today Snapshots, November 5, 2003. Original data from *Information Week 2003 Global Information Security Survey* of 421 business-technology and security professionals.

Taxing the Internet

- An increasingly controversial issue in e-business is whether states should be able to levy a sales tax on Internet sales



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The Dynamic Nature of Information Technology and E-Business

- Today, technology presents a tremendous range of potential applications that can improve the efficiency of employees and companies while providing better service to customers



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Information Technology and E-Business Pays

Computer Executives & Professionals	Average Annual Salary
Chief Information officer	\$ 128,430
Chief Technology officer	\$ 128,164
Internet-technology strategist	\$ 98,811
Product manager	\$ 88,730
Information security manager	\$ 77,959
Database administrator	\$ 72,236
Help-desk/technical support manger	\$ 64,551
Network administrator	\$ 51,265
Help desk/technical support specialist	\$ 43,735

Computer Executives and Professionals, Career Journal, www.careerjournal.com/industry/industries/computer/, 20031125-computer-tsh.html (accessed April 20, 2004); "Tech Hiring: No Longer an Oxymoron," *Business Week Online*, February 4, 2004.