



PART 3: COLLABORATION, COMMUNICATION AND ENTERPRISE SUPPORT SYSTEMS

- **Decision support in more complex settings**
- **Potentially yielding large benefits**
- **Role of the Internet in decision support**
- **Use of computers to support collaborative work, especially decision making**
- **Specialized support given to**



Chapter 9: Networked Decision Support--The Internet, Intranet And Collaborative Technologies

These are changing the way we

- **Manage**
- **Work**
- **Live**



9.1 Opening Vignette: J.P. Morgan Combines **Intranet** and **Notes**

- 15,613 employees in 30 countries
- Web Browsers
- Lotus Notes to
 - Simplify access to crucial corporate database resources on many different platforms and networks
 - Consolidate the information quickly
- Intranet Applications on the Way



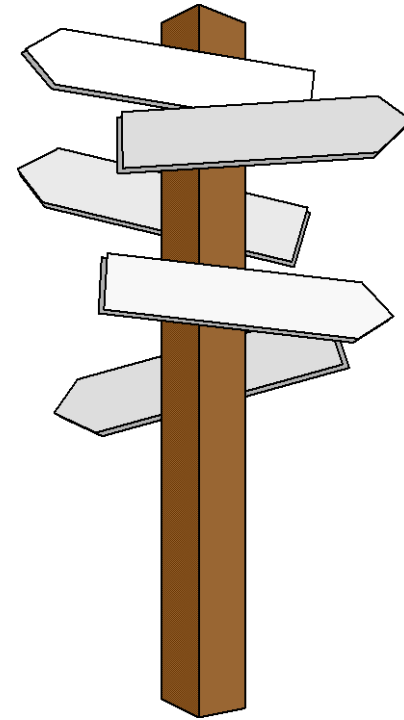
9.2 Networked Decision Support

Opening Vignette Major Characteristics

- Group decision making task
- Group members in different places
- Task must be accomplished very fast
- Impossible or expensive to bring all the team members to one place
- Some information in many sources (external and internal)
- Expertise by nonmembers of the team may be needed
- Use of information technology in a networked decision support environment

The Major Information Architecture

- Internet
- Intranet





Groupware Software Tools (Table 9.1)

- **Includes Group Decision Support Systems (GDSS),**
- **Groupware Examples**
 - Lotus Notes
 - Netscape Communicator
- **Electronic Commerce**
 - Execution of business via computer networks

**TABLE 9.1 Computer Support to Groups**

Topic	Location
Voice technologies	Chapter 7
Browsers, search engines, and intelligent agents	Section 9.4
Information analysis services	Section 9.4
Document interchange services	Section 9.4
Electronic mail	Section 9.6
Bulletin boards and newsgroups	Section 9.6
Messaging systems	Section 9.6
Work flow systems	Section 9.7
Screen sharing	Section 9.7
Integrated conferencing services (computerized plus video and audio)	Section 9.8
Lotus Notes	Section 9.9
Netscape Communicator	Section 9.10
Electronic data interchange (EDI)	Section 9.12
Negotiation support systems	Chapter 10
Group Decision Support Systems	Chapter 10
Idea generation systems	Chapters 10, 19



9.3 The Internet: An Overview

- A network of organizational internal computer networks



Brief Internet History

- **Experimental project of the US Department of Defense (1969)**
- **to test the feasibility of a wide area computer network**
- **over which researchers, educators, military personnel and government agencies,**
- **could share data, exchange messages and transfer files**
- **4 nodes in 1969**
- **Over 50,000 nodes in 1996 (commercial orgs now)**
- **50,000,000 individuals accessed in 1996 (est.)**

Decision Support Systems and Intelligent Systems, Efraim Turban and Jay E. Aronson

– **Backbone: main network that links the nodes**



Current Status

- **Web Browser (Client) and Server Software: easy to use and more natural format for access**
- **World Wide Web (Web)**



9.4 The Intranet

- **Internal Web is a network architecture designed to serve the internal informational needs of an organization, using Web (Internet) concepts and tools**
- **Operates within the company's **firewalls****



The Intranet Changes

- Decision making processes
- Organizational structure and procedures
- Helps reengineer corporations
- Helps to move IT to the end users
- Drives management consolidation

- **Eli Lilly** - U.S. Federal drug approval process done via an Intranet
- **Geffen Records** (Los Angeles, CA) for organizational support



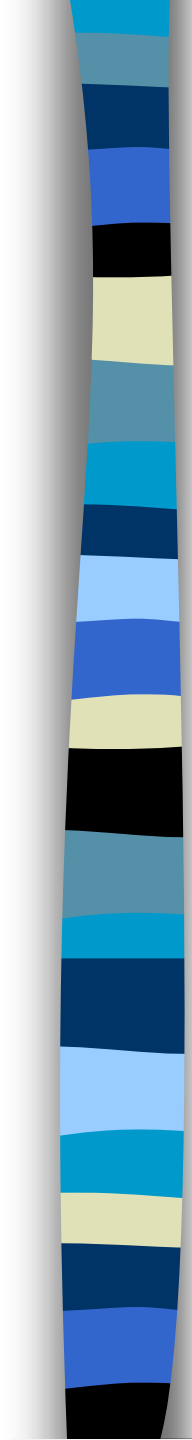
9.5 Data Access and Information Retrieval

- Use Internet and Intranets
- Intelligent Agents (Web Robot or Spider) to *search* and *sift*



9.6 Supporting Communication

- **Communication - Critical for Decision Support**
- **Decision Makers Communicate with**
 - **Experts**
 - **Government Agencies**
 - **Customers**
 - **Vendors**
 - **Business Partners**

- 
- **Decision makers access data and information stored in databases in several locations**
 - **Groups of decision makers must**
 - Communicate
 - Collaborate
 - Negotiate
 - **Information technologies provide inexpensive, fast, and very capable means of providing communication**
 - **Networked computer systems (Intranet/Internet) are the **major enabling architectures****



Specific Communication Technologies

Electronic mail (E-mail) - Advantages

- **Send and receive messages quickly over large distances**
- **Paperless communication**
- **Network connection from anywhere**
- **Mass mailing**
- **Trace correspondence**
- **Communicate with millions worldwide**
- **Collaborative computing**
- **Fast Information access**
- **Send and receive fully formatted documents**
- **Send and receive images**
- **Send and receive software**



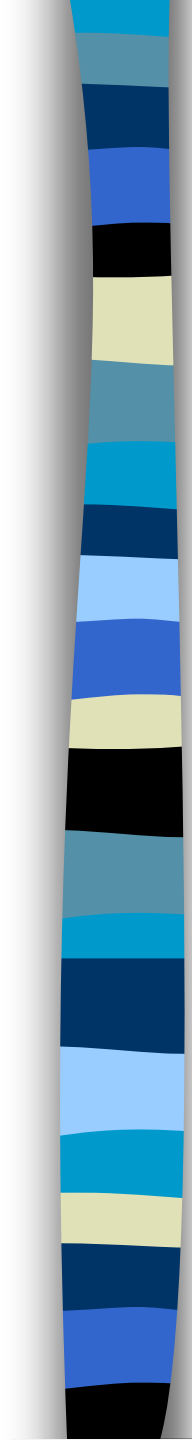
E-Mail

Limitations

- **No face-to-face communication**
- **Typing knowledge required**
- **Security and confidentiality problems**

Also

- **Enabled E-mail**
- **Messaging systems**

- 
- *** Chat Programs**
 - Webchat
 - Internet Relay Chat (IRC)
 - *** Newsgroups**
 - UseNet News (News)
 - *** Mailing Lists**
 - *** ListServe groups**
 - For details, e-mail to:
Listserver@csnccs.com.
 - *** Electronic bulletin boards (EBBs)**
 - Some specialize in certain topics
 - Others are general
 - **ALL can provide some level of decision support**



9.7 Supporting Collaboration

A Time/Place Framework (Figure 9.2)

- **Same Time/Same Place (Decision Room)**
- **Same Time/Different Place (Video Conference)**
- **Different Time/Same Place (via Internet)**
- **Different Time/Different Place**



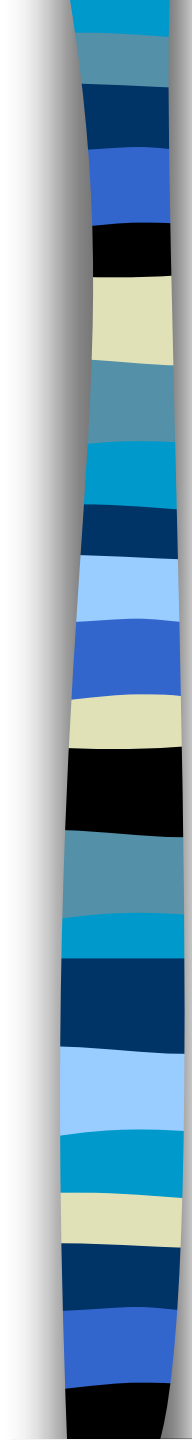
Groupware

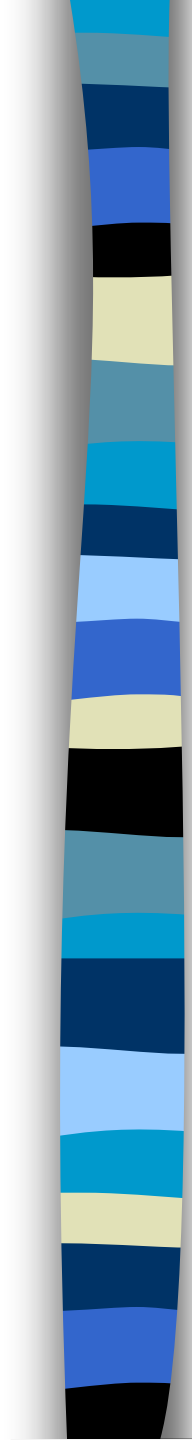
- **Software products that support groups of people engaged in a common task or goal**
- **Provides a mechanism to share opinions and resources**
- **Term is ambiguous**
- **Thousands of software vendors and packages**



Groupware Applications and Development Tools

- 1. Idea Generation (Brainstorming)**
- 2. Managing Sessions**
- 3. Multi-criteria Making Products**
- 4. Strategic Planning Decision Planner**
- 5. Innovator (Meeting-Enhancement Keypad System)**
- 6. One Touch (Supports Remote Teaching and Conferencing)**

- 
- 7. OptionFinder (Brainstorm, weigh alternatives, identify priorities, vote, and work toward consensus in a non-decision room setting. Uses electronic keypads)**
 - 8. Higgins (Group scheduler)**
 - 9. Consensus Builder**
 - 10. Coordinator (Integrated E-mail, scheduling, and calendaring)**
 - 11. Meeting Maker (Groupware scheduler)**
 - 12. Vineyard (Repository of shared information)**
 - 13. OptionLink (Real-time brainstorming for participants at different places and/or different times)**

- 
- 14. LiveBoard (Large electronic document)**
 - 15. Iris (Distributed, multi-user collaborative multimedia writing environment)**
 - 16. Inforum (Meeting facilitating software)**
 - 17. The Meeting Room**
 - 18. InConcert (Workflow management system)**
 - 19. Conference+ (Document sharing)**
 - 20. Team Expert Choice (Group version of Expert Choice)**
 - 21. GroupSystems for Windows (GroupSystems V for DOS) (Complete suite of electronic meeting room software)**
 - 22. TCBWorks (Web-based support for groups in electronic meetings over different times/different places (<http://tcbworks.cba.uga.edu/>))**

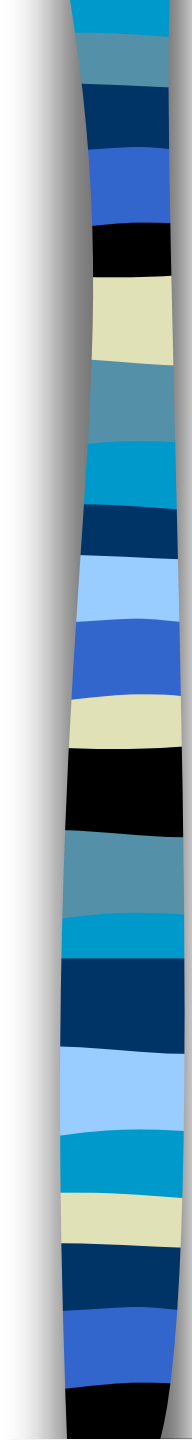
See

- **Groupware Central** at <http://www.cba.uga.edu/groupware/> (The University of Georgia)
- **The Unofficial Yellow Pages of CSCW** Web site at <http://www11.informatik.tu-muenchen.de/cscw/yp/YP-home.html> (Technical University of Munich)



Workflow Systems

- **Powerful business process automation tools**
- **Have evolved into enterprise-wide computing**



Three Types of Workflow Software

1. Administrative

2. Ad hoc

3. Production

- **To provide workflow automation capabilities that provide end-users with tracking, routing, document imaging, and other facilities designed to improve business processes**
- **Web site references in text and on Web**



Screen Sharing

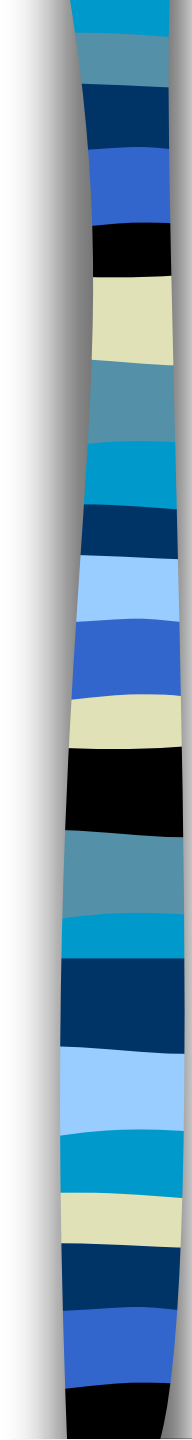
- **Word processing**
- **Spreadsheets**
- **etc.**

- **Distributed Interactive
Desktop Groupware**



The Enhanced Product Realization (EPR) System

- **Internet-based, state-of-the-art distributed system, by InfoTEST. Allow U.S. manufacturers to make product modifications anywhere in the world in as few as five days -- instead of several months**
- **EPR system to accelerate the time-to-market for new products and services**

- 
- **EPR integrates and leverages the Internet to enable collaborative manufacturing and electronic commerce applications - CAD/CAM, Product Data Management Systems, electronic white-boarding, and multi-point desktop videoconferencing**
 - **Internet - non-proprietary, open standards environment: to bring collaborative computing to the entire supply chain**
 - **Extranet**



9.8 Electronic Teleconferencing

- **Telephone Conferencing.**
- **Videoconferencing (now on the desktop PC)**
- **(Video mail)**

Major Benefits of Videoconferencing

- **Face-to-face communication in different location**
- **Simultaneous communication**
- **Several media types**

- **Voice**
- Decision Support Systems and Intelligent Systems, Efraim Turban and Jay E. Aronson
Copyright 1998, Prentice Hall, Upper Saddle River, NJ



Problems with Videoconferencing

- **Connectivity Problems**
- **Choppy Motion**
- **Lack of Standards**
- **Image Compression Problems**



9.9 Lotus Notes (Domino Server)

- **Popular Integrated Groupware Kit**
- **Distributed Document Database**
- **Wide Variety of Capabilities**



Characteristics and Benefits of Lotus Notes

1. **Single, Consistent User Interface**
2. **Compound Documents (multiple data types from multiple sources)**
3. **Rapid Application Development Environment - allows for the rapid development of workgroup applications**
4. **Advanced Security**
5. **Use of Replication**
6. **Openness**
7. **Expanding Industry of value-added products and services**
8. **Scalability**
9. **Seamless Integration of client and server elements**
10. **Availability**
11. **Web-based interfaces**



Capabilities of Lotus Notes

- **Tracking**
- **Broadcasting**
- **References**
- **Team Discussion**



Specialized Application Categories

- **Things to do**
- **Contract library**
- **Corporate policy documents**

- **Notes - Tool for sharing information and improving communication**



Notes Database Types

- **Discussion Databases**
- **Document Libraries**
- **Information Services**

- **Notes as a Forms Generator**
- **Conventional E-mail**



Disadvantages of Notes

- **Cost**
- **Other Aspects**
 - **Lotus Notes / Domino - Web functionality**
 - **Other Notes-related Products**
 - **Notes' capabilities (Figure 9.3)**



9.10 Netscape Communicator

- **Integrated client software product that allows users to communicate, share data, and access information on Intranets and the Internet**
- **Netscape Communicator is an integrated product for open**
 - **E-mail**
 - **Groupware**
 - **Editing**
 - **Calendaring**
 - **Web browsing**



Netscape Communicator Integrates Five Powerful Components

- **Netscape Navigator 4.0 Browser Software**
- **Netscape Composer HTML Authoring Software**
- **Netscape Messenger Electronic Mail**
- **Netscape Collabra Group Discussion Software**
- **Netscape Conference Real-time Collaboration Software**
- **Netscape Communicator Professional Edition adds**
 - **Netscape Calendar scheduling software**
 - **Netscape AutoAdmin**



Advantages of Netscape Communicator

- **Inexpensive Web Browser access**
- **Interface is commonly available and known**
- **Automatically can access information from any Web site**
- **Provides most of the support needed by work groups**
- **Netscape SuiteSpot Enterprise server can provide access to its group generated information**
- **Most databases convert data and files automatically to HTML**



Disadvantages of Netscape Communicator

- **No database management capability**



9.11 Electronic Commerce (EC)

- **Buying and selling of products, services and information via computer networks**
- **A modern business methodology that addresses the needs of organizations, merchants, and consumers to cut costs while improving the quality of goods and services and increasing the speed of delivery**
- **Forrester Research predicts that online shopping will be a \$6.6 billion business in the year 2000, up from \$518 million in 1996**
- **In 1995, \$45.5 billion worth of business-to-business transactions involved the exchange of documents, purchase orders, invoices, or shipping notices**
- **About 20% of those documents were transferred electronically, accounting for \$10 billion worth of transactions**
- **Number of electronic transfers is growing at better than 15% per year, almost 3 times as fast as the growth rate for all business transactions**



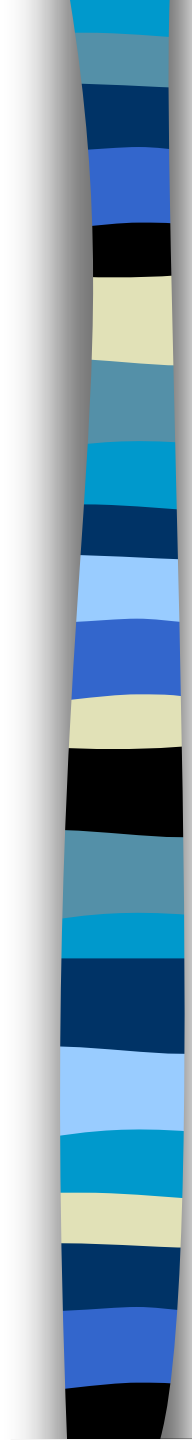
The Internet

- **Advertisement**
- **Auctions**
- **Virtual reality experiences**



EC Applications

- **Electronic Data Interchange (later)**
- **Other (now!)**



Consumer-Oriented Electronic Commerce

- **Enhancing the customer service life cycle phases**
 - **Requirements**: assisting the customer determine needs
 - **Acquisition**: helping the customer acquire a product or service
 - **Ownership**: supporting the customer on an ongoing basis
 - **Retirement**: helping the client dispose of the service or product
- **How?**

- 
- **Advertising on the Internet**
 - **Marketing and Sales**
 - **Market and Product Research**
 - **Customer Support**
 - **Airline flight and fare information**
 - **Package shipping and tracking software**
 - **Electronic help desks**
 - **Free software upgrades, add-ins, and printer drivers over the Web**
 - **Investment analysis tools**
 - **Trading Securities and Commodities**
 - **The Job Market**
 - **Electronic Malls--the Cyber Marketplace**



Business-to-Business Commerce

- **Via EDI (Electronic Data Interchange) [100's of billions of dollars/year]**
- **Advertising**
- **Market research**
- **Auctions**
- **Trading commodities**
- **Venues for commerce:**
 1. **Information distribution**
 2. **EDI interface**
 3. **High-bandwidth pipeline**



9.12 Electronic Data Interchange (EDI)

- **Special type of E-mail**
- **Special Characteristics of EDI**
 1. **Business Transactions Messages**
 2. **Data Formatting Standards**
 - US and Canada - ANSI X.12; UN - EDIFACT**
 3. **Data Formatting and EDI Translators (to standards - X.12)**
- **How EDI Works (Figure 9.4)**



Major Advantages of EDI

- **Send and receive large amounts of information globally in real time.**
- **Very few errors**
- **consistently and free information flow among trading partners**
- **Companies access partners' computers to retrieve and deposit standard transactions**
- **True (and strategic) partnership relationship**
- **Paperless transaction processing system**
- **Shorter cycle time for collecting payments**
- **Automated payments**
- **Cost savings**



EDI Issues

- EDI and the Internet
- Third Party EDI
- For Small Businesses
 - **GE Information Services** (GE TradeWeb)
 - **Harbinger Corp.** (TrustedLink Guardian)



9.13 ETHICS AND LEGAL ISSUES ON THE NET

- 1. Privacy and Ethics in E-mail**
- 2. Right of Free Speech**
- 3. Copyright (Freeware, Shareware)**
- 4. Privacy of Patients' Information**
- 5. Internet Manners (Netiquette, Network Etiquette, Flaming)**

DSS In Focus 9.10: Emoticons in Text-based

Expressions

<g>	grin
LOL	laughing out loud
ROFL	rolling on the floor laughing

Smileys :-)

:-(depressed or upset by a remark	:-P	sticking out tongue
:- 	indifferent	:-[sour
>:->	devilishly sarcastic	:-D	laughing at someone
;-)	winking at a suggestive remark	:-@	screaming
:-7	wry	:)	drunk
:-/	skeptical	X-)	dead
:-&	tongue-tied		

Personal Descriptions

+:-)	a priest or minister	:-E	a vampire
0:-)	like an angel	8-)	wearing sunglasses
C:-)	a chef	::-)	wearing normal glasses
[:o)	a clown	:-#	wearing braces
:-Q	a smoker	:-{}	wearing lipstick
:-?	a pipe smoker	(:-)	left-handed

Moods

:C	Insulted
:]	Friendly
[]	Hug
* * *	Kisses
@>---->---	Couple of dozen roses

(Source: Based in part on D. Sullivan, *The New Computer User*, Fort Worth, TX: The Dryden Press, 1994, p. 277.)



Legal Systems Eventually Catch Up with New Issues

- Employers do own E-mail
- Bulletin board system owner/operators are responsible for content
- Copyrighted Web material is not considered a copy

9.14 Telecommuting (Working at Home)

- **Employees work at home on a computer**
- **More teams with members working at home**





Advantages of Telecommuting

- Fewer interruptions
- Increased productivity.
- Less office and parking needed
- Gainful employment of housebound people
- Flexible hours
- Driving time and expense saved
- Reduced pollution, traffic and fossil fuel use
- People can be hired for specific tasks.
- Improvement in workforce quality
- Happier, more motivated workforce
- Traveling workers can keep in touch
- Freedom to operate anywhere



Major Disadvantages of Telecommuting

- **Supervision difficulties**
- **Lack of human interaction**
- **Increased isolation**

- **Some eliminated by coming to work periodically**



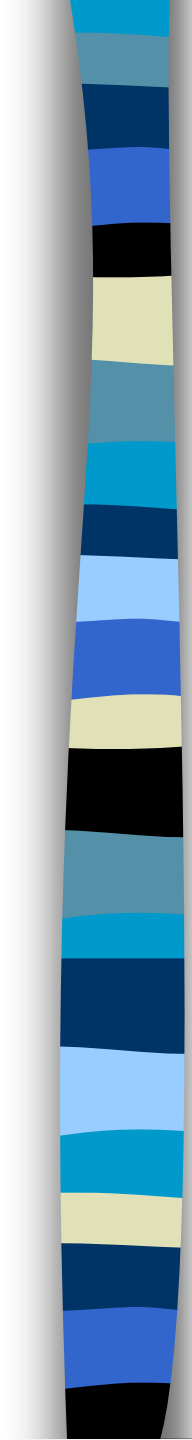
Telecommuting Support

- **Groupware**
- **Regular and Overnight Mail**
- **Special Messengers**
- **Fax Machines**
- **Scanners**

- **The Virtual Office is Gaining Ground**

Summary

- **Groupware**
- **Distributed GSS over the Internet / Intranet**
- **The same/different time/place framework**
- **People can work at home supported by GSS**
- **Using browsers and search engines, one can access enormous amount of information worldwide**
- **Electronic mail**
- **Workflow systems**
- **Chat programs, discussion lists and newsgroups**

- 
- **Video-teleconferencing**
 - **Audio and video teleconferencing over the Internet.**
 - **Demo software available on the Web for enterprise support applications**
 - **Lotus Notes and Netscape Communicator**
 - **Electronic commerce (EC)**
 - **EDI is a special electronic mail**
 - **EDI over the Internet.**
 - **There are many open legal and ethical questions**
 - **Telecommuting**



Questions for the Opening Vignette

- 1. What was the goal of the groupware applications at J.P. Morgan?**
- 2. What is the potential impact of giving all employees access to the Web-based applications?**
- 3. How was J.P. Morgan able to integrate Lotus Notes with its Web strategy? Why was this a good idea?**
- 4. Relate the J.P. Morgan applications to the Price Waterhouse activities described in DSS in Action 9.1.**
- 5. How can using Web browser technology bypass many hardware and software integration problems when setting up groupware?**
- 6. How are the tools being used? Do these applications fit the mold for collaborative technology use? How or how not?**



Case Application 9.1: Cushman And Wakefield Uses Intranet for Decision Support

Case Questions

- 1. Why was the Intranet the best solution for the company's problems?**
- 2. Why was it possible to install an Intranet so inexpensively?**
- 3. How can a chat form improve communication?**
- 4. How can the company brokers communicate with outside brokers using an Intranet/Internet mix?**



Case Application 9.2: General Mills Uses EDI

Case Questions

1. Why was the EDI response time 24 hours?
2. Compare the use of EDI to that of Lotus Notes.
3. Why do they need two EDI codes?
4. Why do they need several VAN vendors?
5. Why was it important to select a translator that is VAN-independent?
6. Why was "enlisting trading partners" the last step in the process, and what difficulties may one encounter?
7. From what you learned about EDI, what kind of transactions can take place between a food manufacturer and its suppliers and customers?
8. Can this EDI be delivered on the Internet? Should it?



APPENDIX 9-A: FUNDAMENTALS OF THE INTERNET

Accessing the Internet

- LAN at work or school via an Internet backbone
- Call from home via modem
- Commercial provider
- Web TV
- Special Internet terminals (Internet Lite)
- Internet Kiosks



Internet Concepts

- **Telnet**
- **The TCP/IP Protocol**
- **Transmission Control Protocol / Internet Protocol**
- **Messages via Packets**
- **The World Wide Web (Web)**
- **Web Browser (client) - GUI Interface**
 - **Netscape Navigator**
 - **Microsoft InternetExplorer**
 - **Text Web Browser - Lynx**



Browsing

- **Like in a Bookstore**
- **Hyperlinks**
- **Hypertext Markup Language (HTML)**
- **Home Page**



Plug-in Applications: Plug-and-play Applications

- **Search Engines**
 - Yahoo, Lycos, WebCrawler, Alta Vista, Infoseek and Excite
- **Uniform Resource Locator (URL) - location (or address) of a Web site**
 - Hypertext Transport Protocol (HTTP)
 - www = on the Web
 - Organization's Domain Name(s)
 - Organization Type (com, edu, gov, org, ...)
 - Country Code (au, fr, uk, cn)
 - File or Subdirectory String
 - <http://www.cba.uga.edu/~jaronson/man340.html>
 - <http://www.prenhall.com/turban>
- **Create Web Documents in the Hypertext Markup Language (HTML) or Use Web Authoring Tools (from Microsoft, Claris, Netscape)**



Gopher

- **Gopher can access any type of textual information on the Internet**
- **Menu-oriented**
- **Downloading Software**
 - Freeware
 - Shareware (www.fagg.uni-lj.si/SHARE/)
- **FTP and Downloading**
- **By the Browser, Using File Transfer Protocol (FTP)**



Specialized Search Tools

- Veronica (Very Easy Rodent-Oriented Netwide Index to Computerized Archives) for Gopher resources
- Archie (short for archives) for FTP resources
- REMEMBER - It's **EASY!!!**