

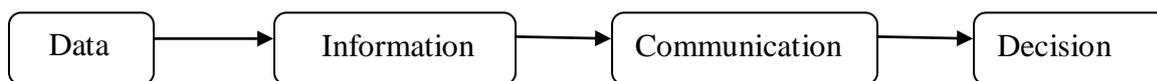
Management Information System

Foundations of Information Systems in Business

Information systems:

An information system (IS) can be any organized combination of people, hardware, software, communications networks, and data resources that stores and retrieves, transforms, and disseminates information in an organization.

Management Information System (M.I.S.) is basically concerned with processing data into information; this is then communicated to the various Departments in an organization for appropriate decision-making.



Data collection involves the use of Information Technology (IT) comprising: computers and tele-communications networks (E-Mail, Voice Mail, Internet, telephone, etc.)

Computers are important for more quantitative, than qualitative, data collection, storage and retrieval; Special features are speed and accuracy, and storage of large amount of data.

Telecommunications provide the means for one-way or two-way communication and for the transmission of messages. A combination of IT is used: telephone, computer, processor, printer, etc. A lot of time and money are saved and the security of data and messages is ensured.

MIS provides several benefits to the business organization: the means of effective and efficient coordination between Departments; quick and reliable referencing; access to relevant data and documents; use of less labor; improvement in organizational and departmental techniques; management of day-to-day activities (as accounts, stock control, payroll, etc.); day-to-day assistance in a Department and closer contact with the rest of the world.

It is important to note that whatever IT is installed must be appropriate to the organization, and to each department.

MIS:

“A management information system (MIS) or computer information system (CIS), consists of five related components: hardware, software, people, procedures, and collections of data.”

The term information technology (IT) represents the various types of hardware and software used in an information system, including computers and networking equipment. The goal of MIS is to enable managers to make better decisions by providing quality information.

The physical equipment used in computing is called **hardware**. The set of instructions that controls the hardware is known as **software**. **Procedures** are instructions that help people use the system. **Databases** are collections of related data that can be retrieved easily and processed by the computers.

There are three levels to use examine the use of information technology, they are:

❖ ***Data management:***

Data consists of factual elements that describe some object or event. Data can be raw numbers or text. Data management systems focus on data collection and providing basic reports.

❖ ***Information systems:***

An information system (IS) can be any organized combination of people, hardware, software, communications networks, and data resources that stores and retrieves, transforms, and disseminates information in an organization.

❖ ***Knowledge bases:***

Knowledge represents a higher level of understanding, including rules, patterns, and decisions. Knowledge-based systems are built to automatically analyze data, identify patterns, and recommend decisions.

Information Technologies

Business professionals rely on a variety of information systems that use various information technologies (IT). While the terms information system and information technology are sometimes used interchangeably, they are two distinct concepts.

Computer hardware technologies:

It includes microcomputers, midsize servers, and large mainframe systems, and the input, output, and storage devices that support them.

Computer software technologies:

It includes operating system software, web browsers, software productivity suites, and software for business applications like customer relationship management and supply chain management.

Telecommunication network technologies:

It includes the telecommunications media, processors, and software needed to provide wire-based and wireless access and support for the internet and private internet-based networks such as intranets and extranets.

Data resource management technologies:

It includes database management system software for the development, access, and maintenance of the databases of an organization.

Importance of Informational Technology:

• **Personal Productivity:**

An enormous amount data is available to managers – generated internally and externally. It is impossible to deal with this volume of data without information technology. Managers today must be capable of performing the tasks within their area of expertise. Ex: accounting managers still practice accounting, lawyers handle cases, and financial managers still track investments.

• **Teamwork and Communication:**

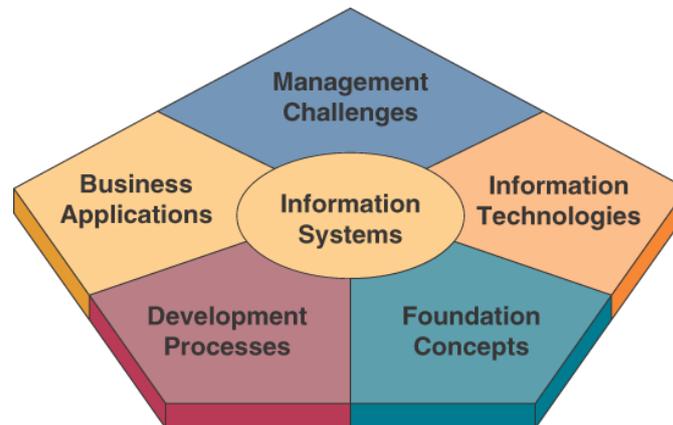
The powerful tools like word processor, a spreadsheet program, and a web browser, will help you to solve business problems that arise at a personal level. But business have many more levels of problems, such as data collection, departmental teamwork, information shared throughout the corporation, and uses of IT that help the business gain a competitive advantage.

- **Business Operation Strategy:**

Information technology is increasingly critical to the daily operations of a business. Obviously, online businesses cannot live without technology, like local grocery store, bank, or many other businesses. Computers process sales, handle payments, and place new orders.

An Information System (IS) framework for business professional

The field of information systems encompasses many complex technologies, abstract behavioral concepts, and specialized applications in countless business and non-business areas. As a manager or business professional you do not have to absorb all of this knowledge.

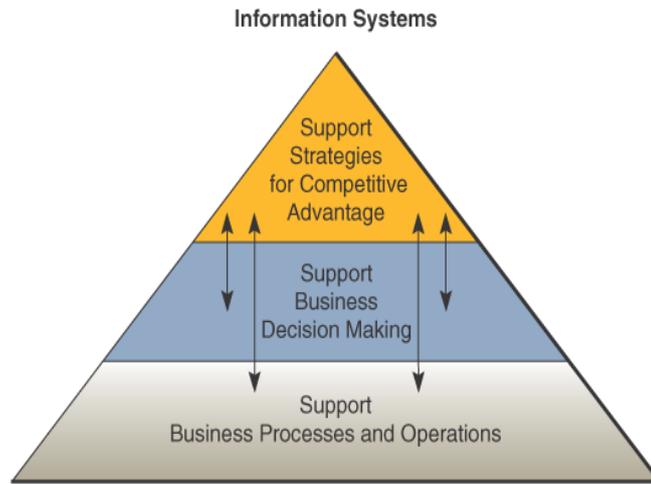


- **Foundation Concepts:** Fundamental behavioral, technical, business and managerial concepts
- **Information Technology:** Hardware, software, networks, data management and Internet-based technology
- **Business Applications:** Major uses of the IS for the operations, management, and competitive advantage of business.
- **Development Processes:** How to plan, develop and implement IS to meet business opportunities
- **Management Challenges:** The challenges of effectively and ethically managing IT at the end user , enterprise, and global levels of a business.

The fundamental roles of information system (IS) in business

There are three fundamental reasons for all business applications of information technology. They are found in the three vital roles that information systems can perform for a business enterprise.

1. Support of its business processes and operations.
2. Support of decision making by its employees and managers.
3. Support of its strategies for competitive advantage.



The following retail store is a good example of how these three fundamental roles can be implemented by a business.

Support Business Processes:

most retail stores now use computer-based information systems to help them record customer purchases, keep track of inventory, pay employees, buy new merchandise, and evaluate sales trends. Store operations would grind (break-up) to a halt without the support of such information systems.

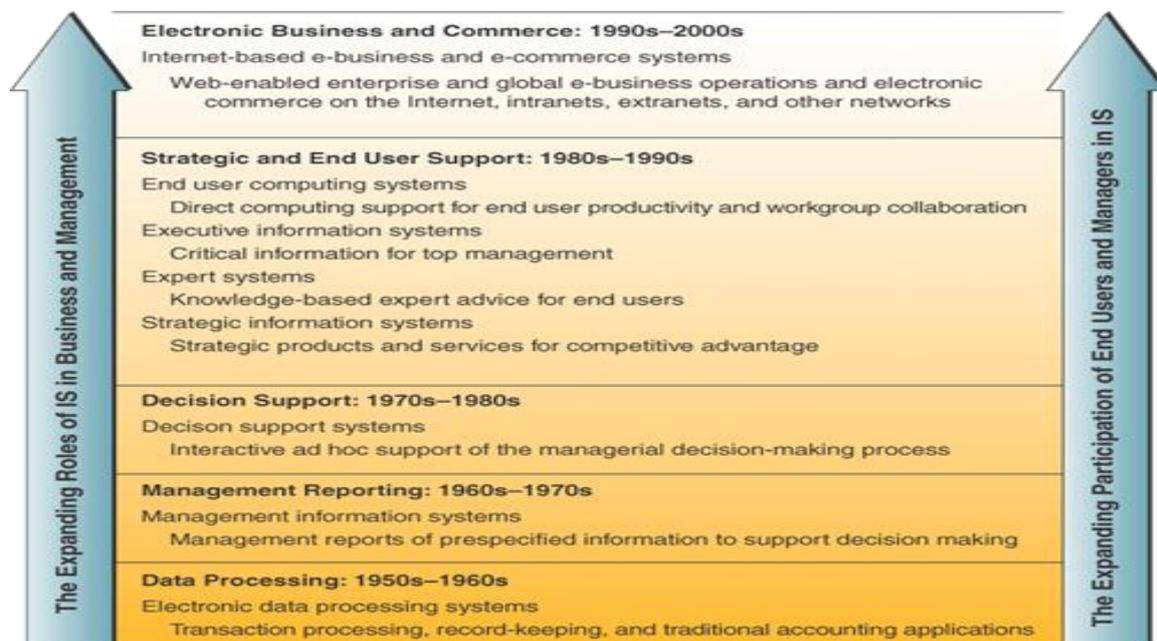
Support Decision Making:

Decisions can be taken on what lines of merchandise need to be added or discounted, or on what kind of investment they require, are typically made after an analysis provided by computer-based information systems

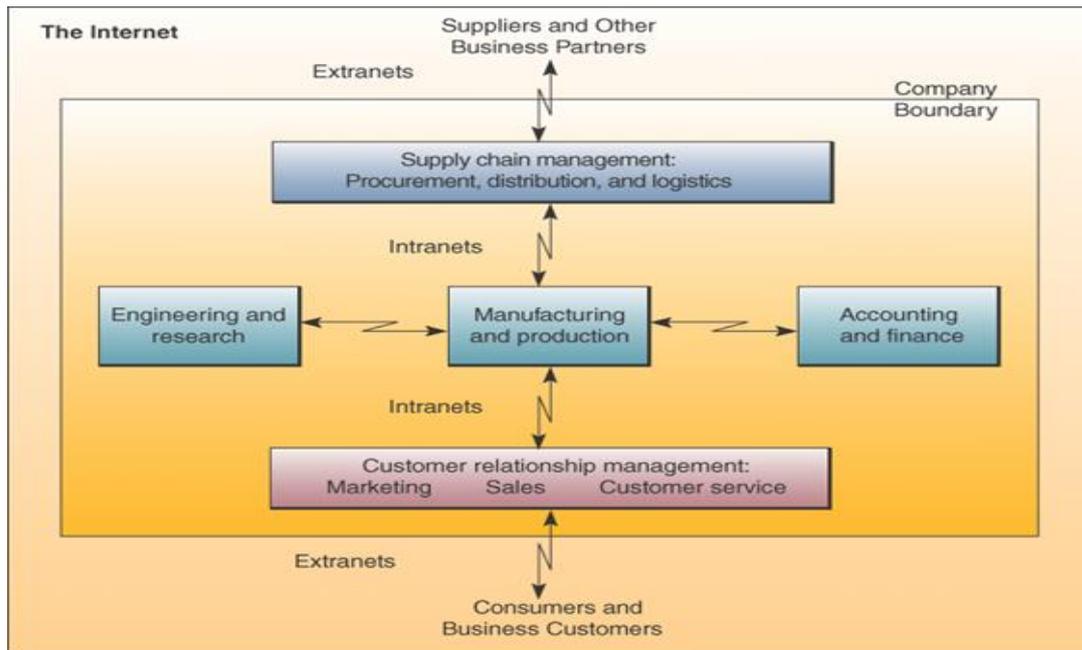
Support Competitive Advantage:

Gaining strategic advantage over competitors requires innovative application of information technologies. For example, store management might make a decision to install touch-screen kiosks in all of their stores, with links to their e-commerce website for online shopping. This might attract new customers and build customer loyalty because of the ease of shopping and buying products provided by such information systems.

Trends in information systems



The Role of e-Business in Business



While some use e-commerce and e-business interchangeably, they are distinct concepts. In e-commerce, information and communications technology (ICT) is used in inter-business or inter-organizational transactions (transactions between and among firms/organizations) and in business-to-consumer transactions (transactions between firms/organizations and individuals).

In e-business, on the other hand, ICT is used to enhance one's business. It includes any process that a business organization (either a for-profit, governmental or non-profit entity) conducts over a computer-mediated network. A more comprehensive definition of e-business is: *"The transformation of an organization's processes to deliver additional customer value through the application of technologies, philosophies and computing paradigm of the new economy."*

Three primary processes are enhanced in e-business:

- **Production processes:** which include procurement, ordering and replenishment of stocks; processing of payments; electronic links with suppliers; and production control processes, among others.
- **Customer-focused processes:** which include promotional and marketing efforts, selling over the Internet, processing of customers' purchase orders and payments, and customer support.
- **Internal management processes:** which include employee services, training, internal information-sharing, video-conferencing, and recruiting. Electronic applications enhance information flow between production and sales forces to improve sales force productivity. Workgroup communications and electronic publishing of internal business information are likewise made more efficient.

E-Commerce:

Electronic commerce or e-commerce or EC, denotes the selling of products over the internet. These sales can be from business to consumers (B2C) or from one business to another business (B2B).

Electronic commerce or e-commerce refers to a wide range of online business activities for products and services. It also pertains to “any form of business transaction in which the parties interact electronically rather than by physical exchanges or direct physical contact.”

E-commerce is usually associated with buying and selling over the Internet, or conducting any transaction involving the transfer of ownership or rights to use goods or services through a computer-mediated network. Though popular, this definition is not comprehensive enough to capture recent developments in this new and revolutionary business phenomenon. A more complete definition is:

“E-commerce is the use of electronic communications and digital information processing technology in business transactions to create, transform, and redefine relationships for value creation between or among organizations, and between organizations and individuals”

Manager’s Role in MIS:

Traditional Management and Observations:

Traditional concepts of management focus on organizing, planning, and control. However, when observed at their jobs, managers appear to spend most of their time in meetings, talking on the phone, reading or preparing reports, discussing projects with their colleagues, explaining procedures, and participating in other activities that are different to fit into the traditional framework.

Henry Mintzberg, a psychologist who studies management, classifies managerial tasks into 3 categories:

Interpersonal:

Interpersonal roles refer to teaching and leading employees.

Informational:

Informational tasks are based on the transfer of information throughout the organization, such as relaying information to subordinates or summarizing information for executives,

Decisional:

Decisions involve evaluating alternatives and choosing directions that benefit the firm.

Fred Luthans uses three classifications of management activities. He indicates that approximately 50 percent of a manager’s time is spent on traditional management activities (planning, organizing, etc.), 30 percent in formal communications, and 20 percent in informal networking. Formal communications include attending meetings and creating reports and memos. Informal networking consists of contacts with colleagues and workers that tend to be social in nature but often involve discussions regarding business and jobs.

Making Decisions

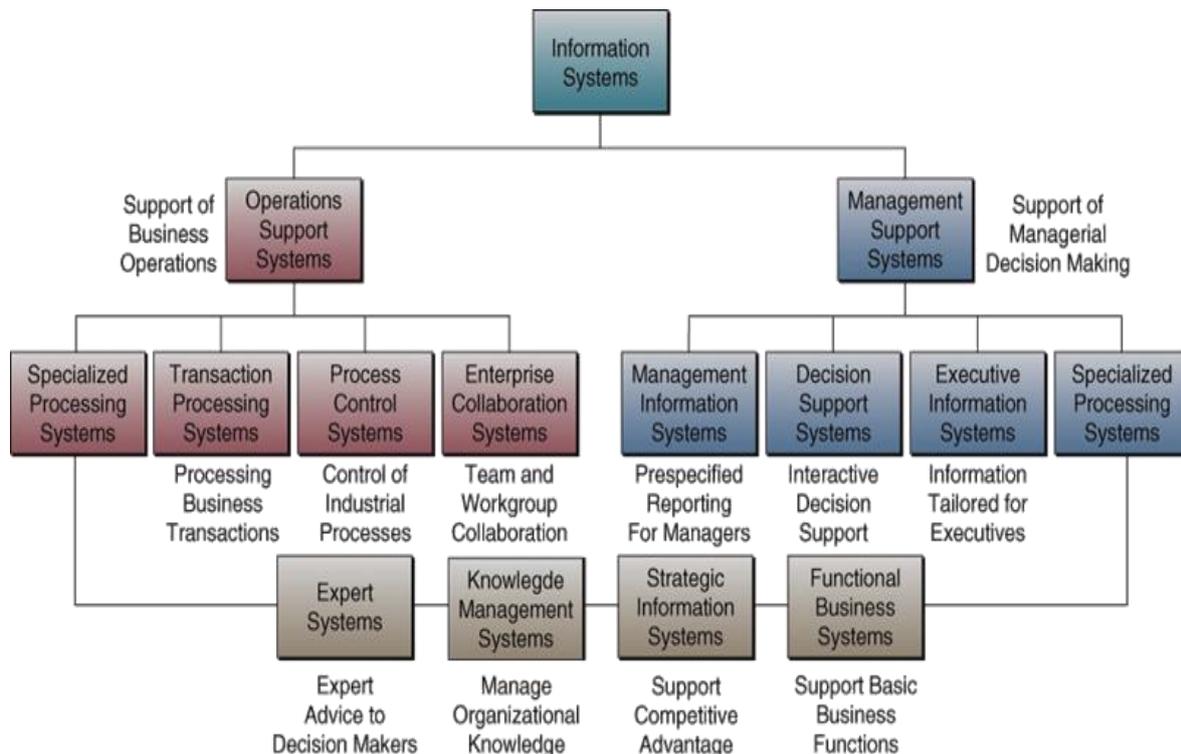
When you look at courses offered for future managers, you will find a focus on administration, human behavior, quantitative modeling and problem solving, decision theory, and elements of business ethics and globalization.

In many organizations, day-to-day decisions are embodied in the methodology, rules, or philosophy of the company. Managers are encouraged to collect data and follow the decisions that have resulted from experience. In this situation and in many others, the managers are directly involved in the decision process, even though they may not think they are making the final choice.

The broader decision process involves collecting data, identifying problems, and making choices. One more step is often involved: persuading others to accept a decision and implement a solution.

Types of Information Systems

The applications of information systems that are implemented in today's business world can be classified in several different ways.



Operations Support Systems

❖ *Transaction Processing Systems*

- Record and process data from business transactions
Examples: sales processing, inventory systems, accounting systems
- Batch Processing:
 - Accumulate transactions over time and process periodically
Example: a bank processes all checks received in a batch at night
- Online Processing:
 - Process transactions immediately

Example: a bank processes an ATM withdrawal immediately

❖ ***Process Control Systems***

- Monitor and control physical processes

Example: in a petroleum refinery use sensors to monitor chemical processes

❖ ***Enterprise Collaboration Systems***

- Enhance team and work group communications

Examples: e-mail, videoconferencing

Management Support Systems

Management support systems provide information and support for effective decision making by managers.

❖ Management Information Systems (MIS)

- Provide reports and displays to managers

Example: daily sales analysis reports

❖ Decision Support Systems (DSS)

- Provide interactive ad hoc support for decision making

Example: A what-if-analysis to determine where to spend advertising Rupees

❖ Executive Information Systems (EIS)

- Provide critical information for executives and managers

Example: easy access to actions of competitors

Operational or Management Systems

❖ Expert Systems

- Provide expert advice

Example: credit application advisor

❖ Knowledge Management Systems

- Support creation, organization and dissemination of business knowledge throughout company

Example: Intranet access to best business practices

Other classifications of Information Systems

❖ Functional business systems

- Focus on operational and managerial applications of basic business functions

Examples: support accounting, finance or marketing

❖ Strategic information systems

- Help get a strategic advantage over its customers

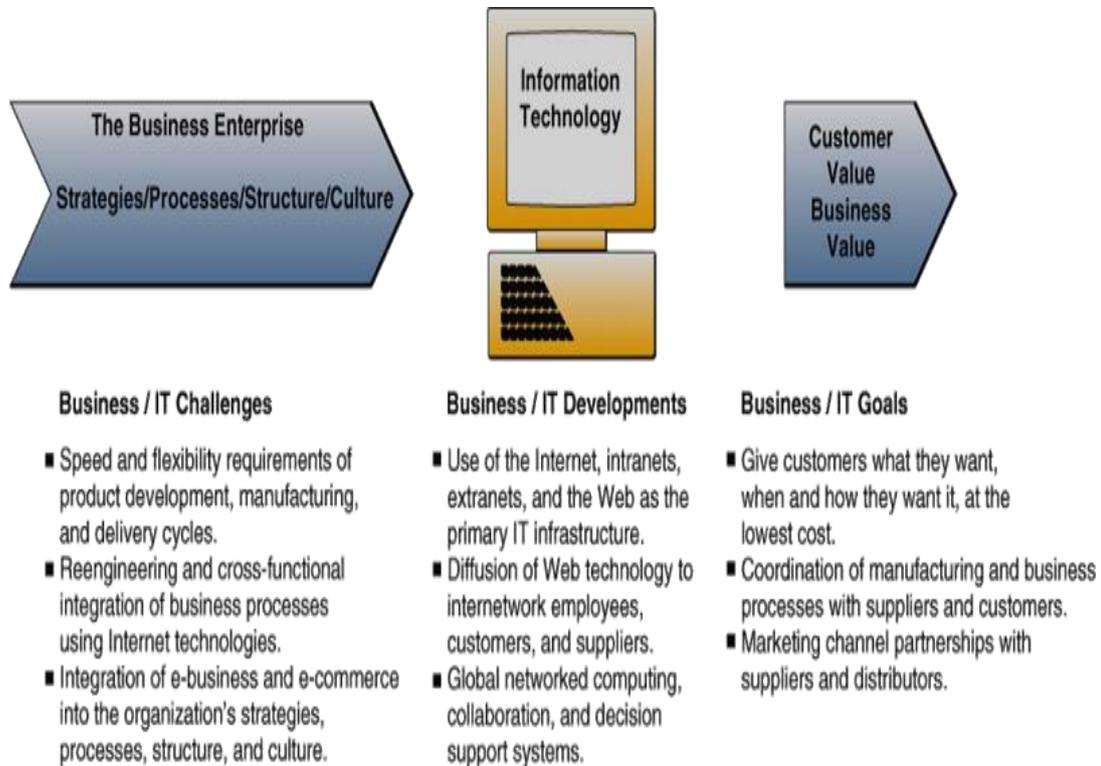
Examples: shipment tracking, e-commerce web systems

❖ Cross-functional information systems

- Systems that are combinations of several types of information systems
Provide support for many functions

Managerial Challenges of Information Technology

Success in today's dynamic business environment depends heavily on maximizing the use of internet-based technologies and web-enabled information systems to meet the competitive requirements of customers, suppliers, and other business partners in a global marketplace.



Success and Failure with IT

The success of an information system should not be measured only by its efficiency but also should be measured by the effectiveness of IT in supporting an organization's business strategies.

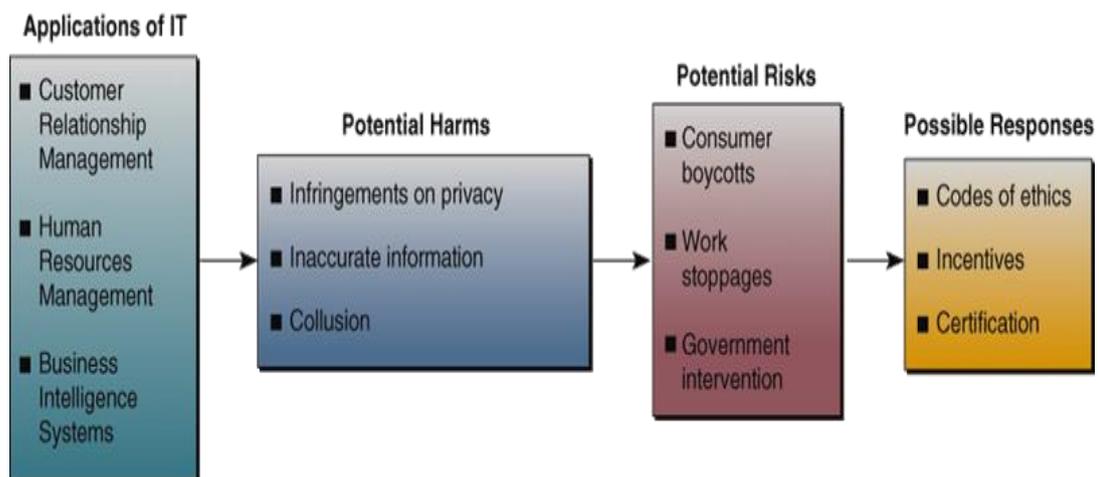
- ❖ Efficiency
 - Minimize cost, time and use of information resources
- ❖ Effectiveness
 - Support business strategies
 - Enable business processes
 - Enhance organizational structure and culture
 - Increase the customer and business value

Developing IS Solutions

In this development process, end users and information specialists **design** information system applications based on an **analysis** of the business requirements of an organization. Examples of other activities include **investigating** the economic or technical feasibility of a proposed application, acquiring and learning how to use the software required to **implement** the new system, and making improvements to **maintain** the business value of a system.



Challenges of Ethics and IT



Ethical Responsibilities:

- What uses of IT might be considered improper or harmful to other individuals or society?
- What is the proper business use of the Internet or a company's IT resources?
- How can you protect yourself from computer crime?

Example: Citibank – e-mail scams.

Challenges of IT careers

- Outsourcing of basic programming to India, the Middle-East and Asia-Pacific countries
- Strong employment opportunities in other areas in IS
- Shortage of qualified IS personnel
- Long-term job outlook positive and exciting

The IS Function

- Major functional area of business
- Important contributor to operational efficiency, employee productivity, morale, customer service and satisfaction
- Major source of information and support for effective decision making
- Vital ingredient in developing competitive products and services in the global marketplace
- Dynamic and challenging career opportunity
- Key component of today's networked business

The components of Information Systems

System Concepts:

Technology

That Computer networks are systems of information processing components that uses variety of hardware, software, data management, and telecommunication network technologies.

Application

That Business uses of Computer networks are really interconnected business information systems.

Development

That developing ways to use computer networks in business includes designing the basic components of information systems.

Management

That managing information technology emphasizes the quality, business value, and security of an organization's information systems.

System

“A system is a group of interrelated components, with a clearly defined boundary, working together toward a common goal by accepting inputs and producing outputs in an organized transformation process.”

❖ **Input:** Involves capturing and assembling elements that enter the system to be processed.

For ex: Raw materials, energy, data, and human effort must be secured and organized for processing.

❖ **Processing:** Involves transformation processes that convert into output. Ex: manufacturing process, the human breathing process or mathematical calculations.

❖ **Output:** Involves transferring elements that have been produced by a transformation process to their ultimate destination. Ex: finished products, human services, and management information must be transmitted to their human users.

The system concept becomes even more useful by including two additional components: feedback and control. A system with feedback and control components is sometimes called a *Cybernetic system* that is self monitoring, self regulating system.

➤ **Feedback** is data about the performance of a system. Ex. Data about sales performance is feedback to a sales manager.

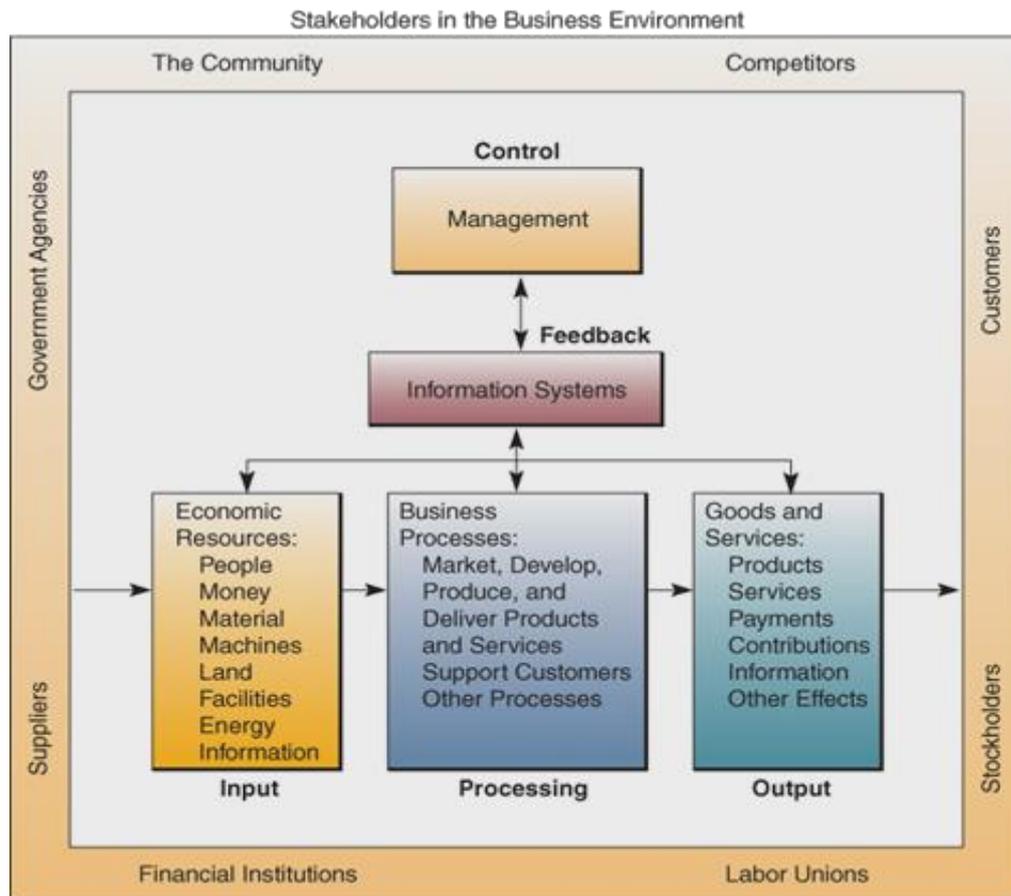
➤ **Control:** involves monitoring and evaluating feedback to determine whether a system is moving toward the achievement of its goal. The control function then makes

necessary adjustments to a system's input and processing components to ensure that it produces proper output.

Example: A/C

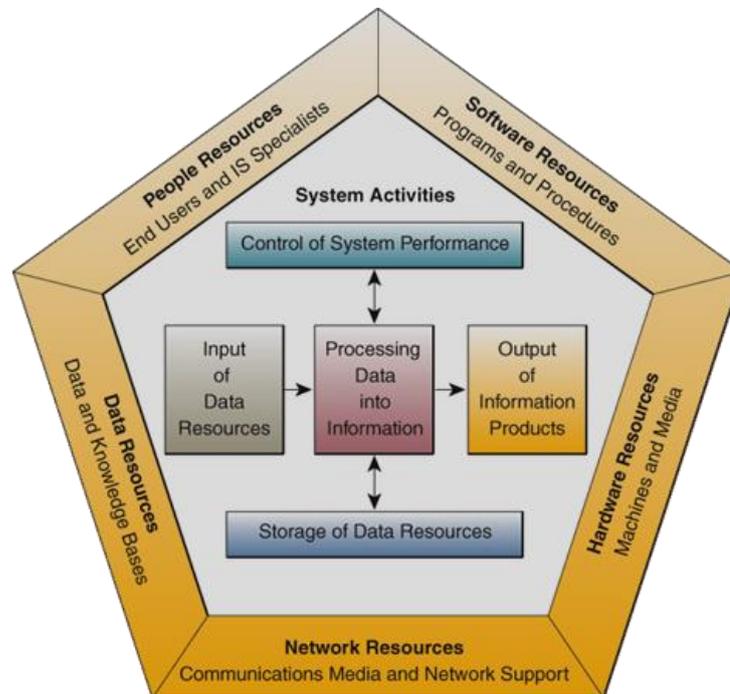
A business as a system

A **business** is an organizational system where economic resources of (input) are transformed by various organization processes (processing) into goods and services (output). Information Systems provide information (feedback) on the operations of the system to management for the direction and maintenance of the system (control), as it exchanges inputs and outputs with its environment.



Components of Information System

Information system Model that expresses a fundamental conceptual framework for major components and activities of information systems.



Information System depends on the resources of people (End user and IS specialists) Hardware (Machine and Media) Software (program and procedures) Data (data and knowledge base) and Network (communication media and Network support) to perform input processing, output, storage and control activities that convert data resources into information products.

Information system model highlights the relationships among the components and activities of information systems. It provides a framework that emphasizes four major concepts that can be applied to all types of information systems.

- ❖ People
 - End users: the people who use the IS or the information from the IS
 - IS specialists: the people who develop and operate IS
- ❖ Hardware Resources
 - All physical devices used in information processing
 - Machines, data media, peripherals
- ❖ Software Resources
 - All information processing instructions including programs and procedures
 - System software, application software and procedures
- ❖ Data Resources
 - Facts about the business transactions
 - Processed and organized information
 - Databases of organized data
- ❖ Network Resources
 - Communications media
 - Network infrastructure: hardware and software
 - The Internet, intranets and extranets

Information Systems Resources

- **People Resource:**
 - **Specialist:** - System analysis, programmer, computer operators.
 - **End user:** - any one else who uses information system.
- **Hardware resource:-**
 - **Machines:** Computers, Video monitors, magnetic disk drive, printers, output scanners.
 - **Media:** Floppy disk, magnetic tape, optical disks, paper forms, plastic card.
- **Software Resources:-**
 - **Programs:** operating system, spreadsheet programs, word processing programs, payroll program.
 - **Procedures:** data entry procedures, error correction procedures, paycheck distribution procedures.
- **Data Resources: -**
 - Procedure descriptions, customer records, employee files, inventory database.
- **Network Resource:-**
 - Communications media, communications processors, network access and control software.

People Resources:

People are the essential ingredient for the successful operation of all information systems.

- **End users** (also called users or clients) are people who use an information system or the information it produces. They can be customers, salespersons, engineers, clerks, accountants, or managers. Most of the end users are **knowledge workers**, that is, people who spend most of the time communicating and collaborating in teams and workgroups and creating, using, and distributing information.
- **IS specialist** are people who develop and operate information systems, they include systems analysts, software developers, system operators, and other managerial, technical, and clerical IS personnel.

Hardware Resources:

The concept of **hardware resources** includes all physical devices and materials used in information processing. Specifically, it includes not only **machines**, such as computers and other equipments, but also all data **media**, that is, tangible objects on which data are recorded, from sheets of paper to magnetic or optical disks.

- **Computer systems**, which consists of central processing units containing microprocessors, and a variety of interconnected peripheral devices. Examples are handheld, laptop, or desktop microcomputer systems, midrange computer systems, and large mainframe computer systems.
- **Computer peripherals**, which are devices such as a keyboard or electronic mouse for input of optical disks for storage of data resources.

Software Resources

The concept of **software resources** includes all sets of information processing instruction. This generic concept of software includes not only the sets of operating instructions called **programs**, which direct and control computer hardware, but also the sets of information processing instructions called **procedures** that people need.

- **System software**, such as an operating system program, which controls and supports the operations of a computer system. Ex: Microsoft windows, Linux, Microsoft Vista, etc.
- **Application software**, which are programs that direct processing for a particular use of computers by end users. Ex: sales analysis program, pay-roll program, word processing program.
- **Procedures**, which are operating instructions for the people who will use an information system. Ex: instruction for filling out a paper form or using a software package.

Data Resources

Data are more than the raw material of information systems. The concept of data resources has been broadened by managers and information systems professionals. They realize that data constitute valuable organizational resources. Thus, you should view data as data resources that must be managed effectively to benefit all end users in an organization.

Data can be in any forms, including traditional alphanumeric data, composed of numbers and alphabetical and other characters that describe business transactions and other events and entities. Text data, consisting of sentences and paragraphs used in written communications; image data, the human voice and other sounds, are also important forms of data.

Data versus information:

Data are raw facts or observations, typically about physical phenomena or business transaction. Data are objective measurements of the **attributes** (the characteristics) of **entities** (people, places, things. And events)

Data that have been converted into a meaningful and useful context for specific end users is called **information**. Data are usually subjected to a value-added process (data processing or information processing)

- Its form is aggregated, manipulated, and organized
- Its content is analyzed and evaluated
- It is placed in a proper context for a human user

Network Resources

Telecommunications technologies and networks like the Internet, Intranet, and Extranets are essential to the successful electronic business and commerce operations of all types of organizations and their computer-based information systems.

- **Communication media** includes twisted-pair wire, coaxial and fiber-optic cables and microwave, cellular, and satellite, wireless technologies.

Network infrastructure, this generic category emphasizes that many hardware, software, and data technologies are needed to support the operation and use of a communications network. Ex: communication processors such as modems, and internetwork processors, and communications control software such network operating systems and internet browser packages (Opera, Google Chrome, Mozilla Firefox)

Information System Activities

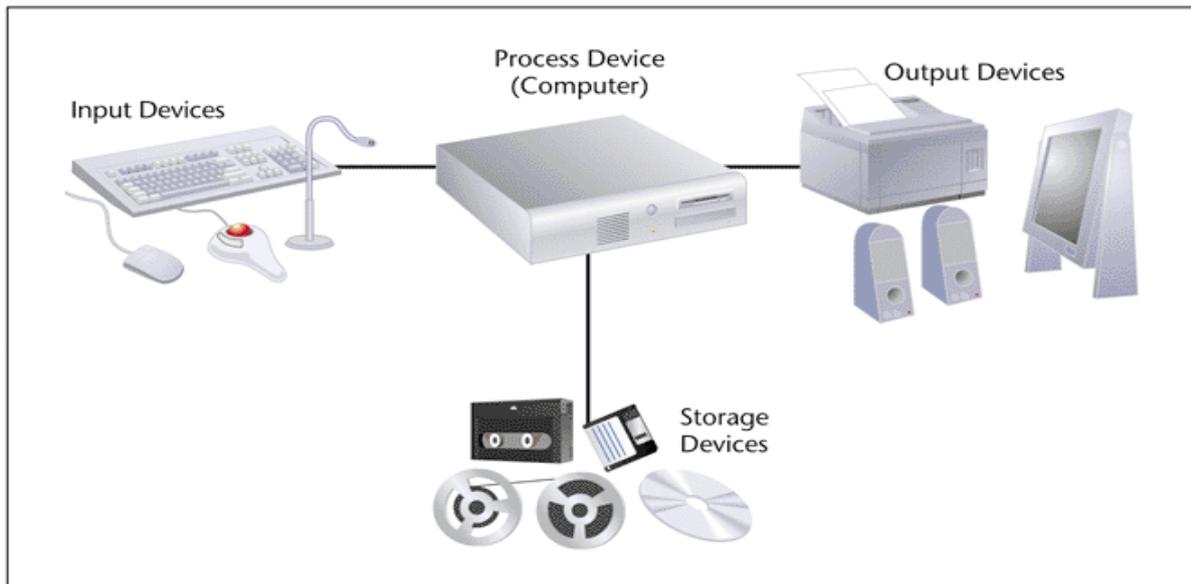
Input: - Optical scanning of bar-code tags on merchandise.

Processing: - Calculating employee pay, taxes and other payroll deductions.

Output: - Producing reports and display about sales performance.

Storage: - Maintaining records on customers, employees, and products.

Control: - Generating audible signals to indicate proper entry of sales data.



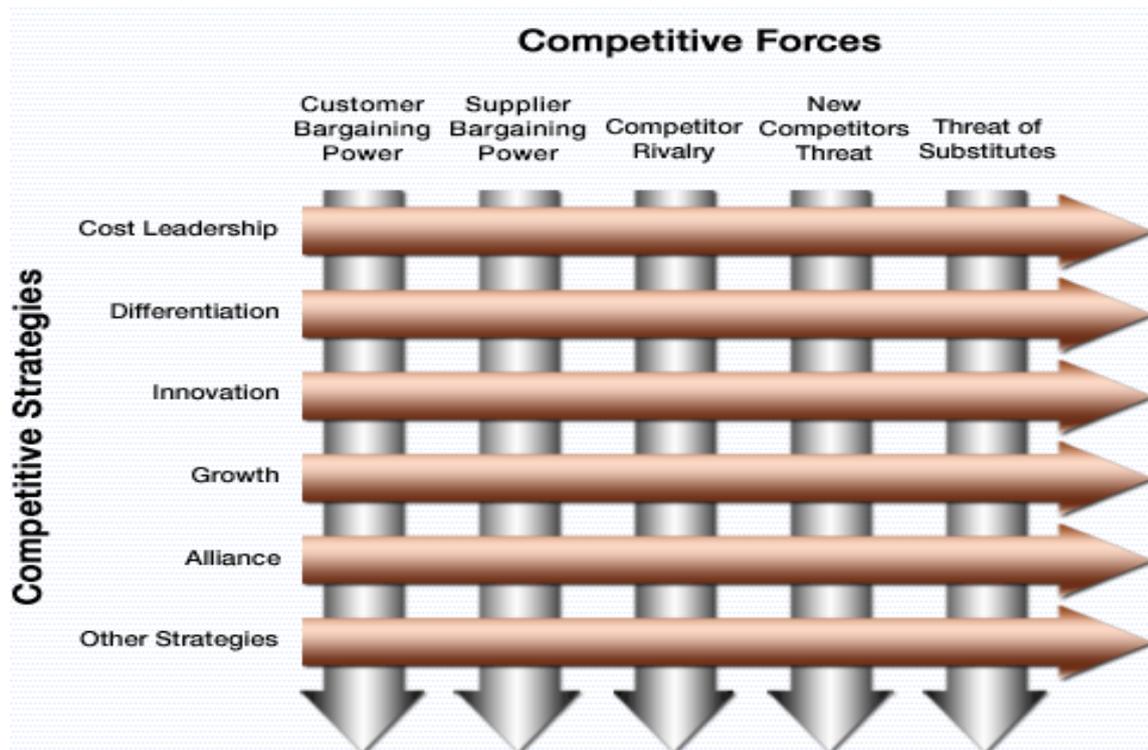
Unit-I
Chap 2

Fundamentals of Strategic Advantage

- ❖ Technology is no longer an afterthought in forming business strategy, but the actual cause and driver.
- ❖ IT can change the way businesses compete.
- ❖ A strategic information system is
 - Any kind of information system
 - That uses IT to help an organization
 - Gain a competitive advantage
 - Reduce a competitive disadvantage
 - Or meet other strategic enterprise objectives

Competitive Forces and Strategies

If a business wants to succeed must develop strategies to counter these forces: Rivalry of competitors within its industry, Threat of new entrants into an industry and its markets, Threat posed by substitute products which might capture market share, bargaining power of customers, bargaining power of suppliers.



❖ Cost Leadership (low cost producer)

- Reduce inventory (JIT)
- Reduce manpower costs per sale
- Help suppliers or customers reduce costs
- Increase costs of competitors
- Reduce manufacturing costs (process control)

❖ Differentiation

- Create a positive difference between your products/services & the competition.
- May allow you to reduce a competitor's differentiation advantage.
- May allow you to serve a niche market.

❖ Innovation

- New ways of doing business
 - Unique products or services
 - New ways to better serve customers
 - Reduce time to market
 - New distribution models

❖ Growth

- Expand production capacity
- Expand into global markets
- Diversify
- Integrate into related products and services.

❖ Alliance

- Broaden your base of support
 - New linkages
- Mergers, acquisitions, joint ventures, “virtual companies”
- Marketing, manufacturing, or distribution agreements.

❖ Other Competitive Strategies

- Locking in customers or suppliers
 - Build value into your relationship
- Creating switching costs
 - Extranets
 - Proprietary software applications
- Raising barriers to entry
 - Improve operations or promote innovation
- Leveraging investment in IT
 - Allows the business to take advantage of strategic opportunities

Strategic Uses of Information Technology

Ex: Wal Mart – Just-in-time process of inventory control – Explain...

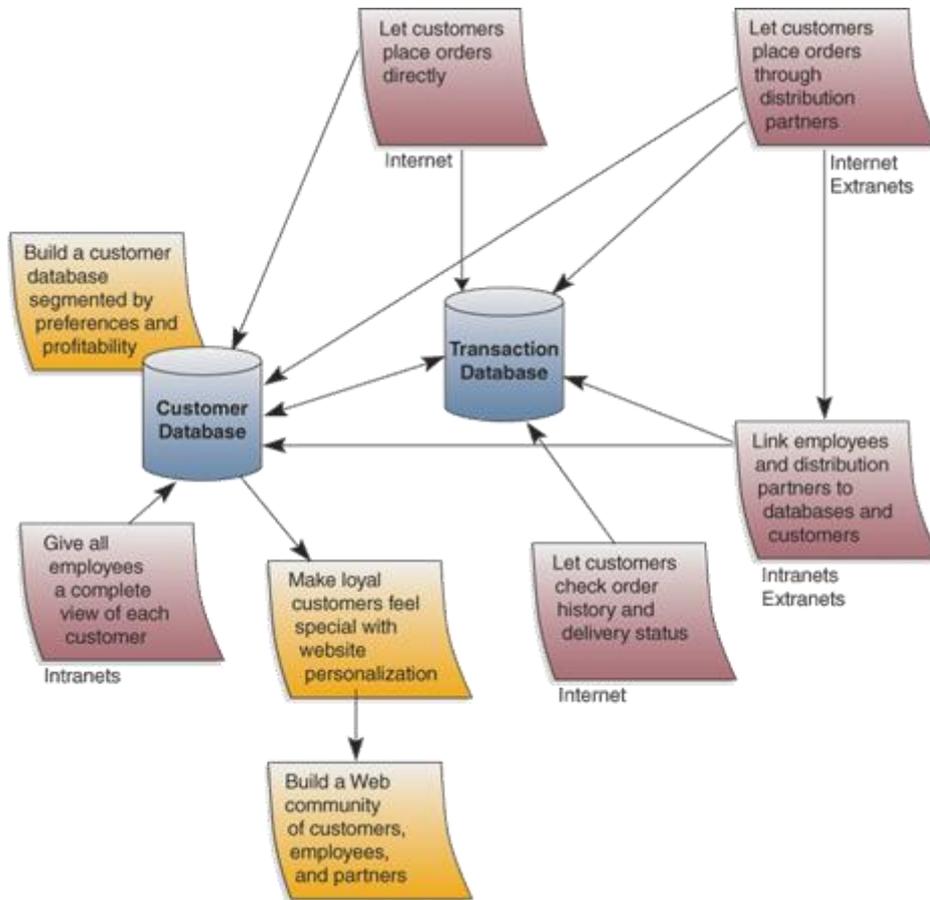
Building a Customer-focused Business

- ❖ business value in being customer-focused
 - Keep customers loyal
 - Anticipate their future needs
 - Respond to customer concerns
 - Provide top-quality customer service
- ❖ Focus on customer value
 - Quality not price has become primary determinant of value

We can provide customer value through:

- ❖ Track individual preferences
- ❖ Keep up with market trends
- ❖ Supply products, services and information anytime, anywhere
- ❖ Provide customer services tailored to individual needs
- ❖ Use Customer Relationship Management (CRM) systems to focus on customer

Example: Hilton hotel HRW – Hilton reservation worldwide: Explain...



The Value Chain and Strategic IS

- ❖ View the firm as a chain of basic activities that add value to its products and services
- ❖ Activities are either
 - Primary processes directly related to manufacturing or delivering products
 - Support processes help support the day-to-day running of the firm and indirectly contribute to products or services
- ❖ Use the value chain to highlight where competitive strategies can best be applied to add the most value

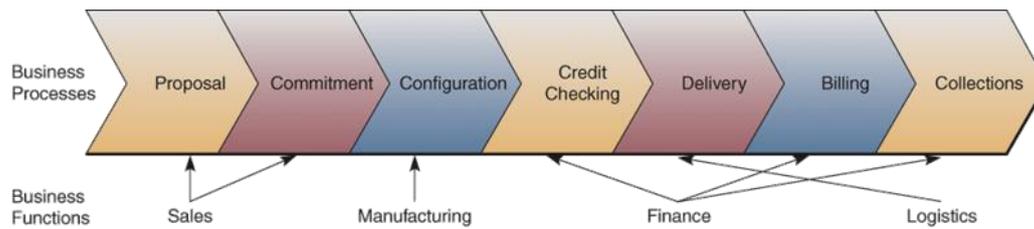


Using Information Technology for Strategic Advantage

Business Process Reengineering:

- ❖ Called BPR or Reengineering
 - Fundamental rethinking and radical redesign
 - Of business processes
 - To achieve improvements in cost, quality, speed and service
- ❖ Potential payback high
- ❖ Risk of failure is also high

The Cross-functional Process



Reengineering order management

Reengineering Order Management
• Customer relationship management systems using corporate intranets and the Internet.
• Supplier managed inventory systems using the Internet and extranets.
• Cross-functional ERP software for integrating manufacturing, distribution, finance, and human resource processes.
• Customer-accessible e-commerce websites for order entry, status checking, payment, and service.
• Customer, product, and order status databases accessed via intranets and extranets by employees and suppliers.

Becoming an Agile Company

- ❖ Agility is the ability of a company to prosper
 - In a rapidly changing, continually fragmenting
 - Global market for high-quality, high-performance, customer-configured products and services
- ❖ An agile company can make a profit with
 - Broad product ranges
 - Short model lifetimes

- Mass customization
 - Individual products in large volumes

Four strategies for agility

An agile company:

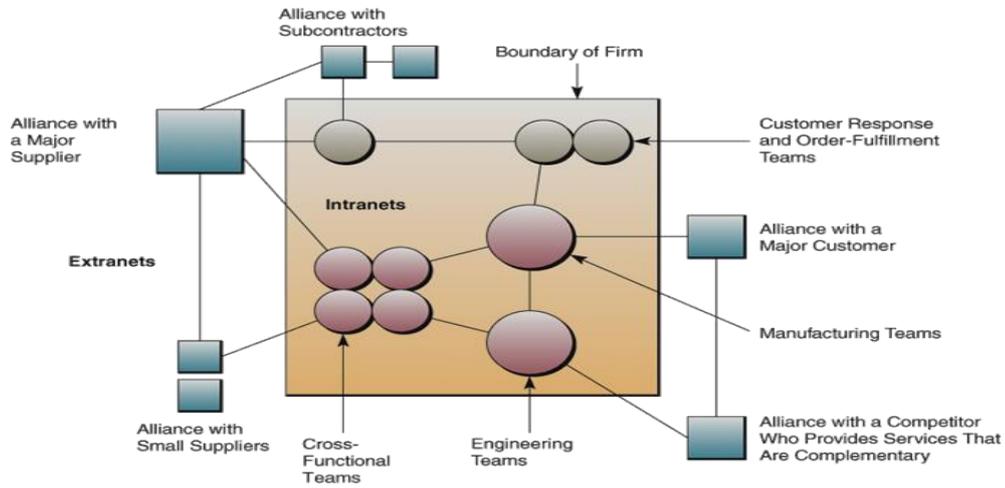
- Provides products as solutions to their customers' individual problems
- Cooperates with customers, suppliers and competitors to bring products to market as quickly and cost-effectively as possible
- Organizes so that it thrives on change and uncertainty
- Leverages the impact of its people and the knowledge they possess

How IT helps a company be agile:

Type of Agility	Description	Role of IT	Example
Customer	Ability to co-opt customers in the exploitation of innovation opportunities <ul style="list-style-type: none"> • As sources of innovation ideas • As cocreators of innovation • As users in testing ideas or helping other users learn about the idea 	Technologies for building and enhancing virtual customer communities for product design, feedback, and testing	eBay customers are its de facto product development team because they post an average of 10,000 messages each week to share tips, point out glitches, and lobby for changes.
Partnering	Ability to leverage assets, knowledge, and competencies of suppliers, distributors, contract manufacturers, and logistics providers in the exploration and exploitation of innovation opportunities	Technologies facilitating interfirm collaboration, such as collaborative platforms and portals, supply-chain systems, etc.	Yahoo! has accomplished a significant transformation of its service from a search engine into a portal by initiating numerous partnerships to provide content and other media-related services from its website.
Operational	Ability to accomplish speed, accuracy, and cost economy in the exploitation of innovation opportunities	Technologies for modularization and integration of business processes	Ingram Micro, a global wholesaler, has deployed an integrated trading system allowing its customers and suppliers to connect directly to its procurement and ERP systems.

Virtual Company

- ❖ A virtual company uses IT to link
 - People,
 - Organizations,
 - Assets,
 - And ideas
- ❖ Creates inter-enterprise information systems
 - to link customers, suppliers, subcontractors and competitors



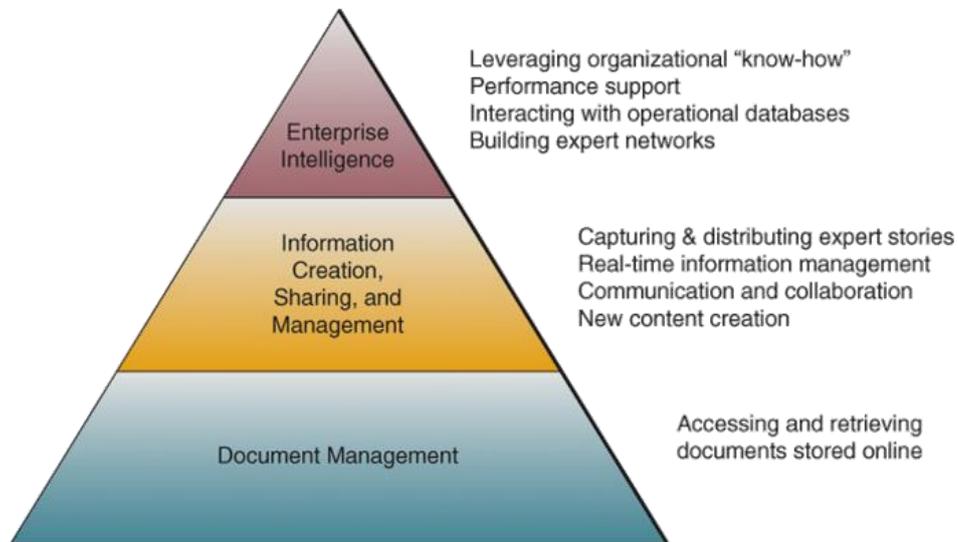
Strategies of virtual companies

Strategies of Virtual Companies
• Share infrastructure and risk with alliance partners.
• Link complementary core competencies.
• Reduce concept-to-cash time through sharing.
• Increase facilities and market coverage.
• Gain access to new markets and share market or customer loyalty.
• Migrate from selling products to selling solutions.

Building a knowledge-Creating Company

- ❖ Knowledge-creating company or learning organization
 - Consistently creates new business knowledge
 - Disseminates it throughout the company
 - And builds in the new knowledge into its products and services
- ❖ Explicit knowledge
 - Data, documents and things written down or stored on computers
- ❖ Tacit knowledge
 - The “how-to” knowledge which reside in workers’ minds
- ❖ A knowledge-creating company makes such tacit knowledge available to others

Knowledge management techniques



❖ KMS manage organizational learning and business know-how

❖ Goal:

- Help knowledge workers to create, organize, and make available knowledge
- Whenever and wherever it's needed in an organization.

Telecommunication and Networks

Networking the Enterprise

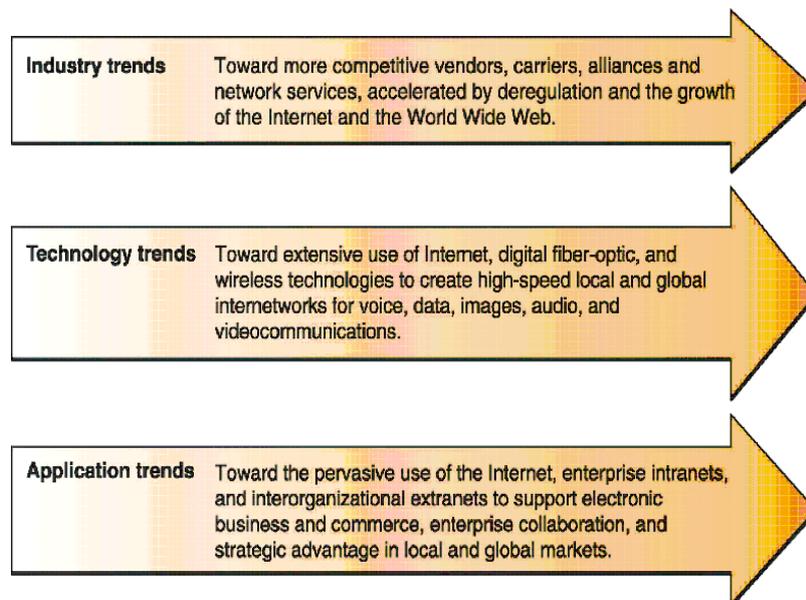
When computers are networked, two industries – computing and communications – converge (join), and the result is vastly more than the sum of the parts. Suddenly, computing applications become available for business-to-business coordination and commerce, and for small as well as large organizations.

- Networking business and employees
- Connecting them to customers, suppliers, and other stakeholders

Thus the telecommunications and network technologies are internetworking and revolutionizing business and society. Businesses have become networked enterprises.

Trends in Telecommunications

Telecommunications is the exchange of information in any form (voice, data, text, images, audio, video) over networks. Early telecommunication networks did not use computers to route traffic and, as such, were much slower than today's computer-based networks.



❖ *Industry Trends:*

The telecommunications industry has changed from government-regulated monopolies to a deregulated market with fiercely competitive suppliers of telecommunications services. Numerous companies now offer businesses and consumers a choice of everything from local and global telephone services to communications satellite channels, mobile radio, cable TV, cellular phone services, and Internet access.

❖ *Technology Trends:*

- Unrestricted connectivity

- Easy access for end users
 - Open systems
 - » Use common standards for hardware, software, applications, & networking.
- High degree of interoperability
- Digital networks
 - Higher transmission speeds
 - Moves larger amounts of information
 - Greater economy
 - Lower error rates
 - Multiple types of communications on the same circuits
 - Fiber-optic lines & cellular, PCS, satellite & other wireless technologies
 - Faster transmission speeds

❖ **Business Application Trends:**

- Dramatic increase in the number of feasible telecommunication applications.
- Cut costs, reduce lead times, shorten response times, support e-commerce, improve collaboration, share resources, lock in customers & suppliers, & develop new products & services

The Business Value of Telecommunications Networks

Use of the intranets, extranets, internets, and other telecommunications networks can dramatically cut costs, shorten, business lead times and response times, support electronic commerce, improve the collaboration of workgroups, develop online operational processes, share resources, lock in customers and suppliers, and develop new products and services.

Examples of the business value of business applications of telecommunications networks:

Strategic Capabilities	e-Business Examples	Business Value
Overcome geographic barriers: Capture information about business transactions from remote locations	Use the Internet and extranets to transmit customer orders from traveling salespeople to a corporate data center for order processing and inventory control	Provides better customer service by reducing delay in filling orders and improves cash flow by speeding up the billing of customers
Overcome time barriers: Provide information to remote locations immediately after it is requested	Credit authorization at the point of sale using online POS networks	Credit inquiries can be made and answered in seconds
Overcome cost barriers: Reduce the cost of more traditional means of communication	Desktop videoconferencing between a company and its business partners using the Internet, intranets, and extranets	Reduces expensive business trips; allows customers, suppliers, and employees to collaborate, thus improving the quality of decisions reached
Overcome structural barriers: Support linkages for competitive advantage	Business-to-business electronic commerce websites for transactions with suppliers and customers using the Internet and extranets	Fast, convenient services lock in customers and suppliers

The Internet Revolution

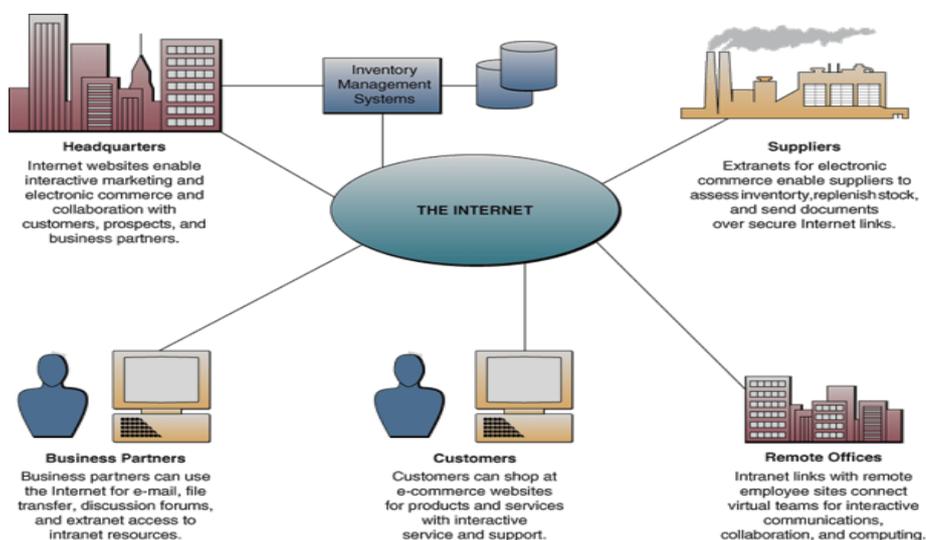
The explosive growth of the Internet is a revolutionary phenomenon in computing and telecommunications. The internet has become the largest and most important network of networks today, and has evolved into a global information superhighway. We can think of the internet as a network made up of millions of smaller private networks each with the ability to operate with the other millions of networks connected to the internet.

The Net doesn't have a central computer system or telecommunications center. Instead, each message sent has a unique address code so any internet server in the network can forward it to its destination. Also, the internet does not have a headquarters or governing body. International advisory and standards group of individual and corporate members such as the Internet Society (www.isoc.org) and the World Wide Web Consortium (www.w3.org), promote use of the internet and the development of new communications standards.

Popular uses of the Internet

Business Use of the Internet

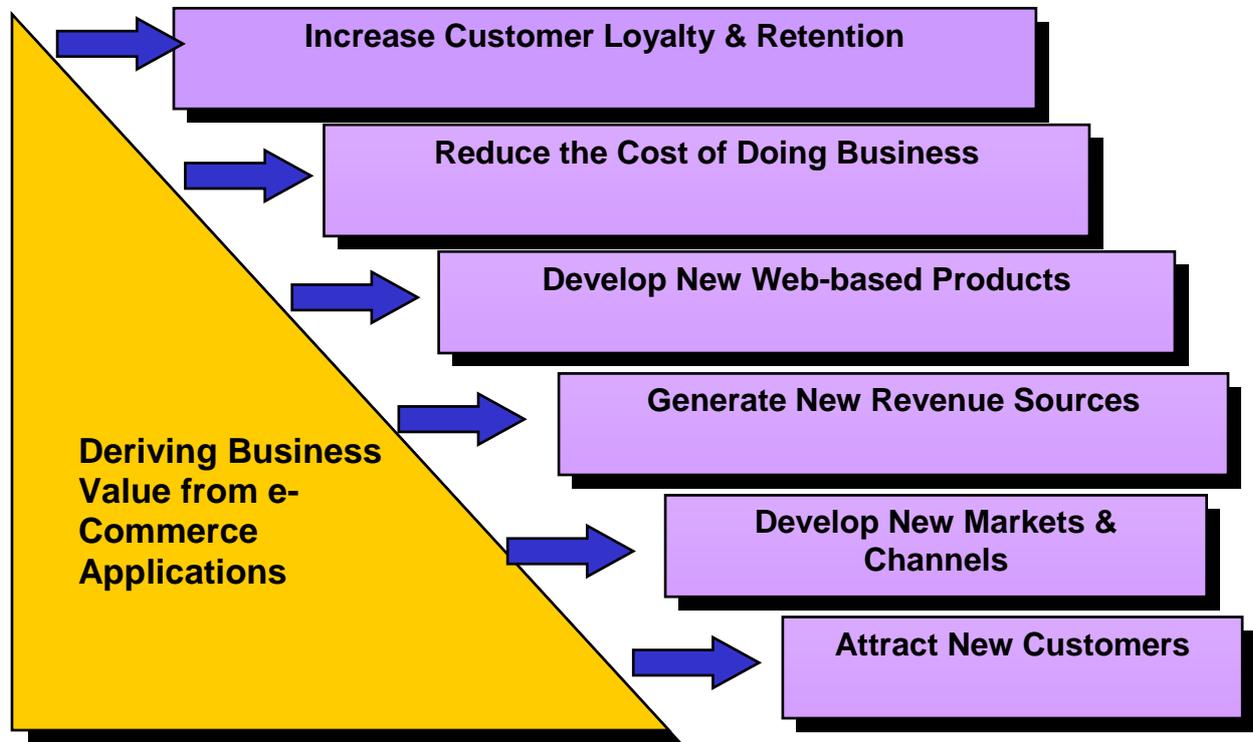
<ul style="list-style-type: none">• Surf. Point-and-click your way to thousands of hyperlinked websites and resources for multimedia information, entertainment, or electronic commerce.
<ul style="list-style-type: none">• e-Mail. Use e-mail and instant messaging to exchange electronic messages with colleagues, friends, and other Internet users.
<ul style="list-style-type: none">• Discuss. Participate in discussion forums of special-interest newsgroups, or hold real-time text conversations in website chat rooms.
<ul style="list-style-type: none">• Publish. Post your opinion, subject matter, or creative work to a website or weblog for others to read.
<ul style="list-style-type: none">• Buy and Sell. Buy and sell practically anything via e-commerce retailers, wholesalers, service providers, and online auctions.
<ul style="list-style-type: none">• Download. Transfer data files, software, reports, articles, pictures, music, videos, and other types of files to your computer system.
<ul style="list-style-type: none">• Compute. Log onto and use thousands of Internet computer systems around the world.
<ul style="list-style-type: none">• Other Uses. Make long-distance phone calls, hold desktop videoconferences, listen to radio programs, watch television, play video games, explore virtual worlds, etc.



The Business Value of the Internet

Strategic capabilities which enable businesses to disseminate information globally, communicate interactively with customized information and services for individual customers, and foster collaboration of people and integration of business processes within the enterprise and with business partners.

Some of the primary sources of business value include attracting new customers with innovating marketing and products, and retaining present customers with improved customer service and support. Most companies are building e-business and e-commerce websites to achieve six major business values:



Many companies perceive the business value of the Internet for electronic commerce. Substantial cost savings can arise because applications that use the Internet and Internet-based technologies (like intranets and extranets) are typically less expensive to develop, operate, and maintain than traditional systems.

Example: American Airlines saves money every time customers use their website instead of their customer support telephone system.

Intranets

Intranets utilize standard network hardware and software technologies like [Ethernet](#), [WiFi](#), [TCP/IP](#), Web browsers and Web servers. An organization's intranet typically includes Internet access but is [firewalled](#) so that its computers cannot be reached directly from the outside.

- Communicate via e-mail
- Share files, online forms, and applications
- Share databases, schedules, and calendar resources
- Receive company-wide broadcasts
- Place orders locally or remotely

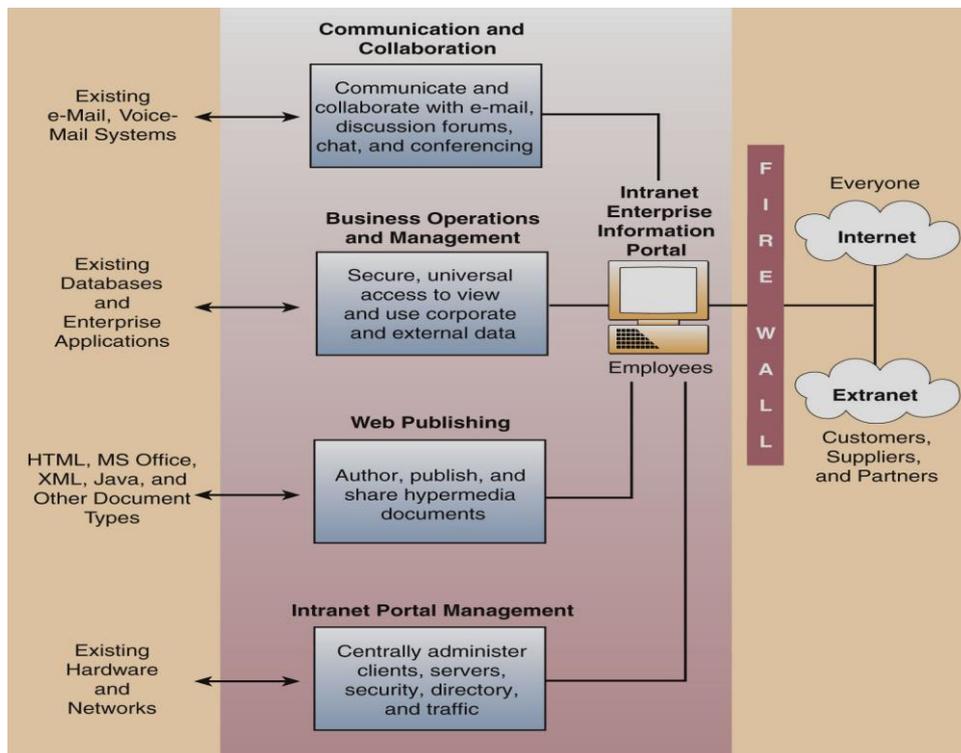
The Role of Intranets

To improve productivity and collaboration within your company, your employees need to be able to share ideas quickly, not to mention software and hardware resources.

To increase competitive advantage, your customers, suppliers, and partners need reliable ways to get information about new products and services, engage in e-commerce, and share business information. If your technology budget is limited, you need a cost-effective way to meet these needs. An Intranet or Extranet may be the answer.

The business value of the internets

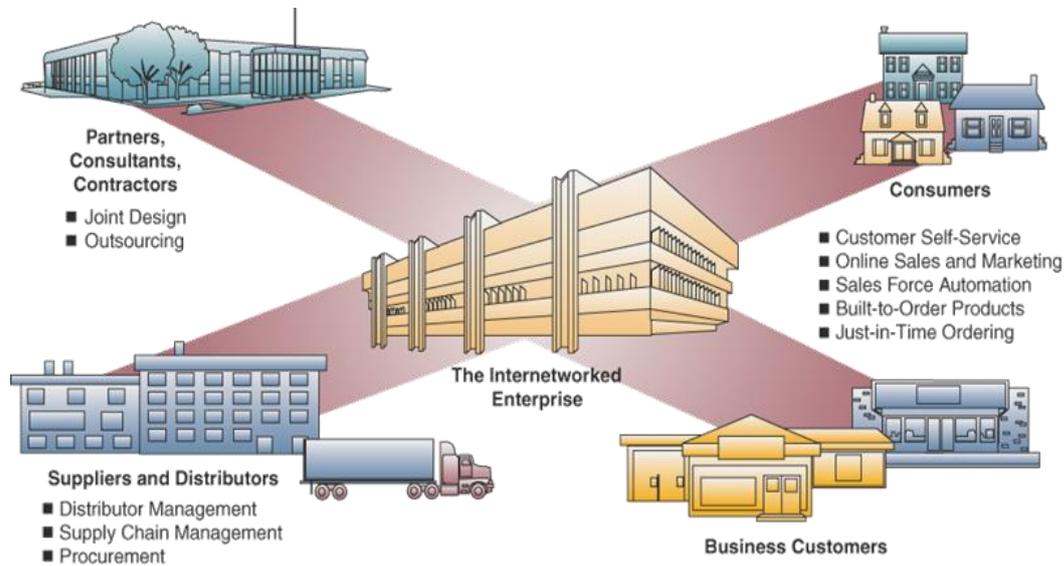
Organizations of all kinds are implementing a broad range of intranet uses. One way that companies organize intranet application is to group them conceptually into a few user services categories that reflect the basic services that intranets offer to their users.



The Role of Extranets

An Extranet is a secure, private network that extends company applications over the Internet. Only selected customers, suppliers, and partners can access these Extranet applications. Another name for an Extranet is Virtual Private Network. An Extranet or Virtual Private Network enables:

- Access to company information like forms, product documentation, and training schedules—by selected outside parties
- Online catalogs with customer-specific pricing levels
- Online order entry, order status, and shipping schedule look-up
- Online support and customer service
- New product and service announcements via web pages
- Secure e-mail exchange with customers, vendors, and business partners



The business value of the extranets

- Improve communication with customers and business partners
- Gain competitive advantage in
 - Product development
 - Cost savings
 - Marketing
 - Distribution
 - Leveraging their partnerships

Telecommunications Network Alternatives

Telecommunication alternatives

Network Alternative	Examples of Alternatives
Networks	Internet, intranet, extranet, wide area, local area, client/server, network computing, peer-to-peer
Media	Twisted-pair wire, coaxial cable, fiber optics, microwave radio, communications satellites, cellular and PCS systems, wireless mobile and LAN systems
Processors	Modems, multiplexers, switches, routers, hubs, gateways, front-end processors, private branch exchanges
Software	Network operating systems, telecommunications monitors, Web browsers, middleware
Channels	Analog/digital, switched/nonswitched, circuit/message/packet/cell switching, bandwidth alternatives
Topology/architecture	Star, ring, and bus topologies, OSI and TCP/IP architectures and protocols

A Telecommunication Network Model

Generally, a communication network is any arrangement where a sender transmits a message to receiver over a channel consisting of some type of medium.

A simple conceptual model of a telecommunications network, which shows that it consists of five basic categories of components:

Terminals

These are networked microcomputer workstations or video input/output stations that provide the sending and receiving endpoints for the network.

Telecommunications Processors

These are specialized hardware components that support data transmission and reception between terminals and computers.

Telecommunications Channels and Media

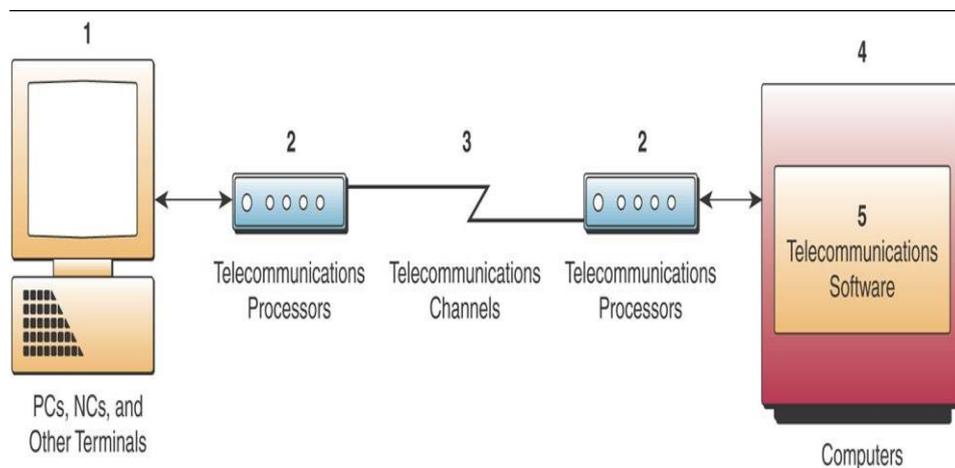
A channel connects two or more parties in a network. Media are the particular way a channel is connected. Telecommunications channels use combinations of media such as copper wires, coaxial cables, fiber optic cables, and microwave carriers to transmit information.

Computers

All sizes and types of computers can and are connected to telecommunications networks. Typical arrangements include using a mainframe as a host for the network, a minicomputer as a front-end processor, with a dedicated microcomputer as a network server to a smaller local group of networked microcomputer workstations.

Telecommunications Control Software:

Software controls the interaction of the computers on the telecommunications information system. Mainframes use telecommunications monitors in their role as host computers. Network operating systems are specially designed for microcomputer servers while individual microcomputers on the network access its functions by communications packages.

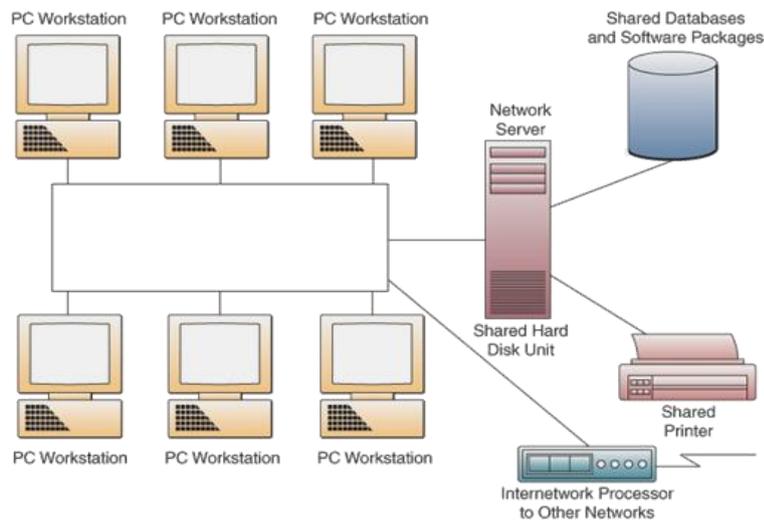


Types of Telecommunications Networks

Many different types of networks serve as the telecommunications infra structure for the internet and the intranets and extranets of internet-worked enterprises. Some of the types are:

Local Area Networks

Local Area Networks (LAN) connect computers and other information processing devices within a limited physical area, such as an office, classroom, building, manufacturing plant, or other work site. LANs have become commonplace in many organizations for providing telecommunications network capabilities that link end users in offices, departments, and other workgroups.



Key concepts and components of LANs include:

Network Interface Card: PCs on a network must have a circuit board installed to handle the network interface. This is the typical way of expanding PC capability.

Network Server: As mentioned earlier, this is a dedicated PC with a large hard disk capacity for secondary storage. Many servers also have more RAM than the individual workstations on the network.

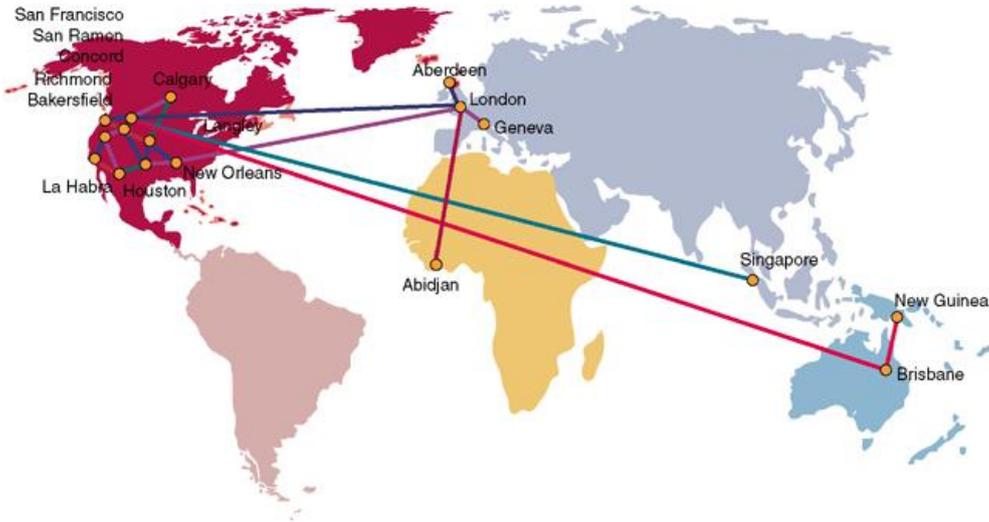
Network Operating System: Just as individual PCs have their own operating systems, the network operating system controls the interface between users and machine hardware as well as the telecommunications peripherals linking them.

Internet-works: Most LANs are connected via telecommunications to other networks, which might be other LANs; wide area networks (WANs), mainframes, or very large networks like the Internet.

Wide Area Networks

Wide Area Networks (WAN) covers a large geographic area. Networks that cover a large city or metropolitan area (WAN) are also included in this category. Such large networks have become a necessity for carrying out the day-to-day activities of many business and government organizations and their end users.

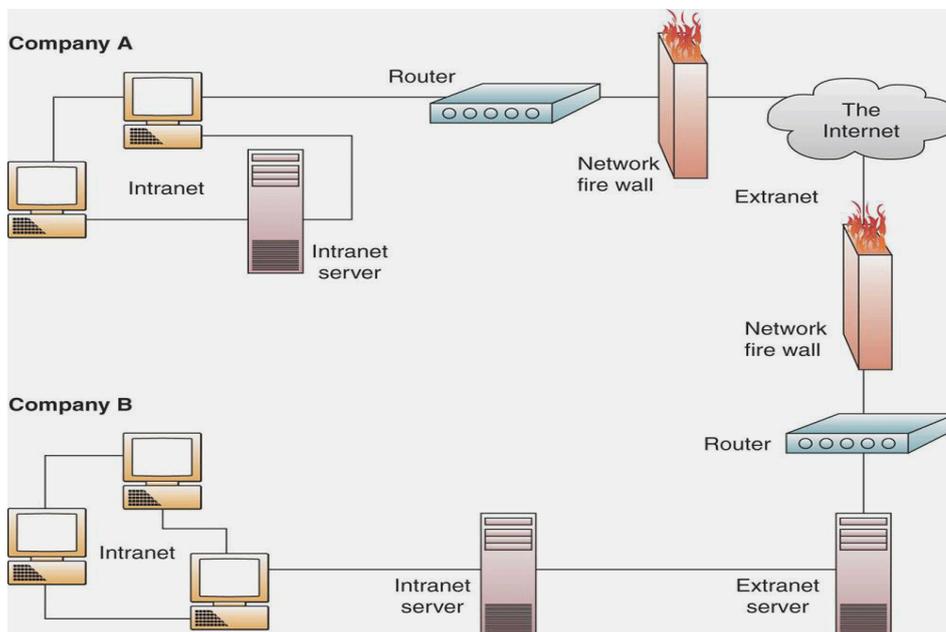
Example: WANs are used by many multinational companies to transmit and receive information among their employees, customers, suppliers, and other organizations across cities, regions, countries, and the world.



Virtual private network

A virtual private network is a secure network that uses the Internet as its main backbone network, but relies on the fire walls and other security features of its Internet and intranet connections and those of participating organizations.

Example: VPN's would enable a company to use the Internet to establish secure intranets between its distant branch offices and manufacturing plants, and secure extranets between itself and its customers and suppliers.



Client/Server Networks

A client on a network is typically a microcomputer that serves an end user for most of her or his processing needs. Programs for the client and extra processing capacity are provided as needed by the network.

A server is a host or central computer that is dedicated to managing the logistics of routing data, information, and processing capacity among the clients on the system. In small networks, the server might be a single PC. On larger networks, the server can be a minicomputer or a mainframe. In very large organizations, several networks might be served, each by their own minicomputer, which in turn, is linked to the host mainframe.

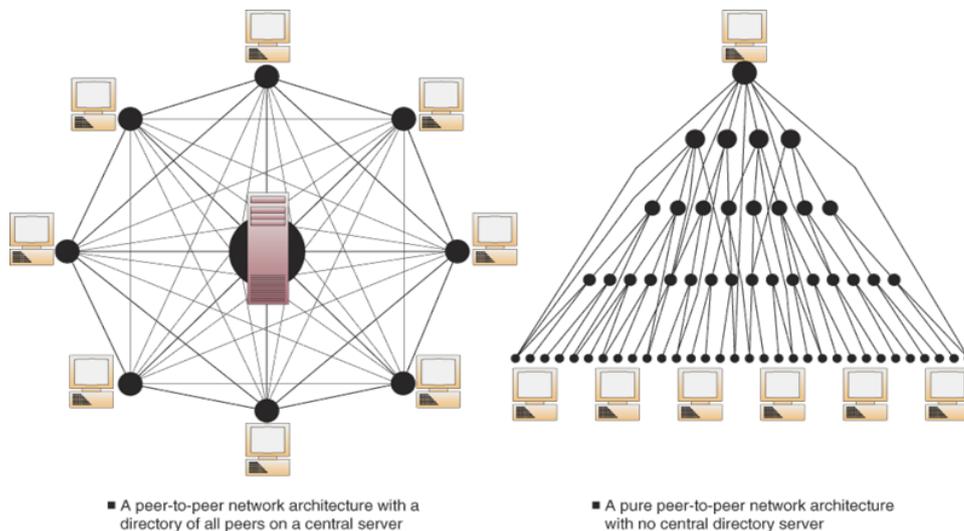
Network Computers

Provide a browser-based user interface for processing small applications programs called applets. Thin clients include network computers, Net PCs and other low-cost network devices or information appliances. Application and database servers provide the operating system, application software, applets, databases, and database management software needed by the end users in the network.

Network computing is sometimes called a three-tier client/server model, since it consists of thin clients, application servers, and database servers.

Peer-to-Peer Networks

- Networks that connect from one PC to another PC
- Common use is the downloading and trading of files



Telecommunications Media

Telecommunications channels make use of a wide variety of media. In some cases, the media are complementary and the use of more than one media increases the functions and features of the telecommunications network. In other cases, the media are in direct competition with each other, hoping to capture customers from other media choices.

Twisted-Pair Wire



This is the traditional phone line used throughout the world. It is the most widely distributed telecommunications media but is limited in the amount of data and speed of transmission.

Coaxial Cable



This is a sturdy copper or aluminum wire wrapped in spacers to insulate and protect it. Coaxial cable can carry more information and at higher speeds than twisted pair wires. It also is a higher-quality carrier, with little interference.

Fiber Optics



These are hair-thin glass filaments spun into wires and wrapped in a protective jacket. Fiber optics transmit light pulses as carriers of information and so are extremely fast and produce no electromagnetic radiation. This makes them extremely reliable channels, although splicing cables for connections is difficult.

Terrestrial Microwave

Earthbound microwave radiation transmit high-speed radio signals in line-of-sight paths between relay stations..

Communications Satellites

Satellites in geosynchronous orbit are used to transmit microwave signals to any place on earth using dish antennas for sending and receiving.

Cellular Radio

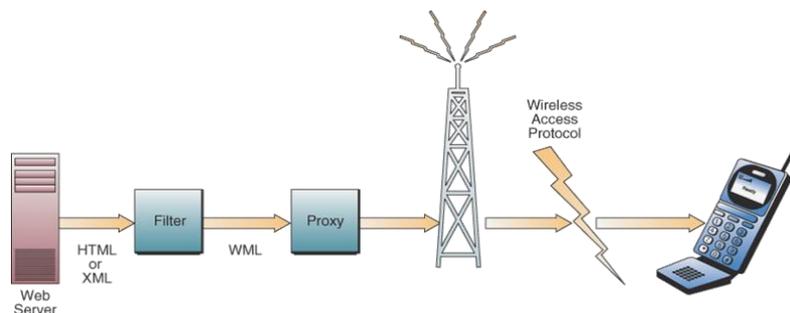
Low power transmitters on each cell of the system allow users to take advantage of several frequencies for communications.

Wireless LANs

Using radio or infrared transmission, some LANs are completely wireless, thus eliminating the cost of installing wire in existing structures.

Wireless Web

Wireless access to the internet, intranets, and extranets is growing as more web enabled information appliances proliferate. Smart telephones, pagers, PDAs, and other portable communications devices have become very thin clients in wireless networks.



Telecommunications Processors

Modem (Modulator-DEModulator). A device that converts the digital signals from input/output devices into appropriate frequencies at a transmission terminal and converts them back into digital signals at a receiving terminal.

Multiplexer:

An electronic device that allows a single communications channel to carry simultaneous data transmission from many terminals.

Internetwork Processors:

Communications processors used by local area networks to interconnect them with other local area and wide area networks. Examples include switches, routers, hubs, and gateways.

- Switches
 - Makes connections between telecomm circuits so a message can reach its intended destination
- Router
 - Interconnects networks based on different rules or protocols
- Hub
 - Port switching communications processor
- Gateway
 - A processor that interconnects networks that use different communications architecture

Fire wall:

Computers, communications processors, and software that protect computer networks from intrusion by screening all network traffic and serving as a safe transfer point for access to and from other networks.

Network Operating System:

Is a program that controls telecommunications and the use and sharing of network resources.

Telecommunications Monitor:

Computer programs that control and support the communications between the computers and terminals in a telecommunications network.

Middleware:

Software that helps diverse networked computer systems work together, thus promoting their interoperability.

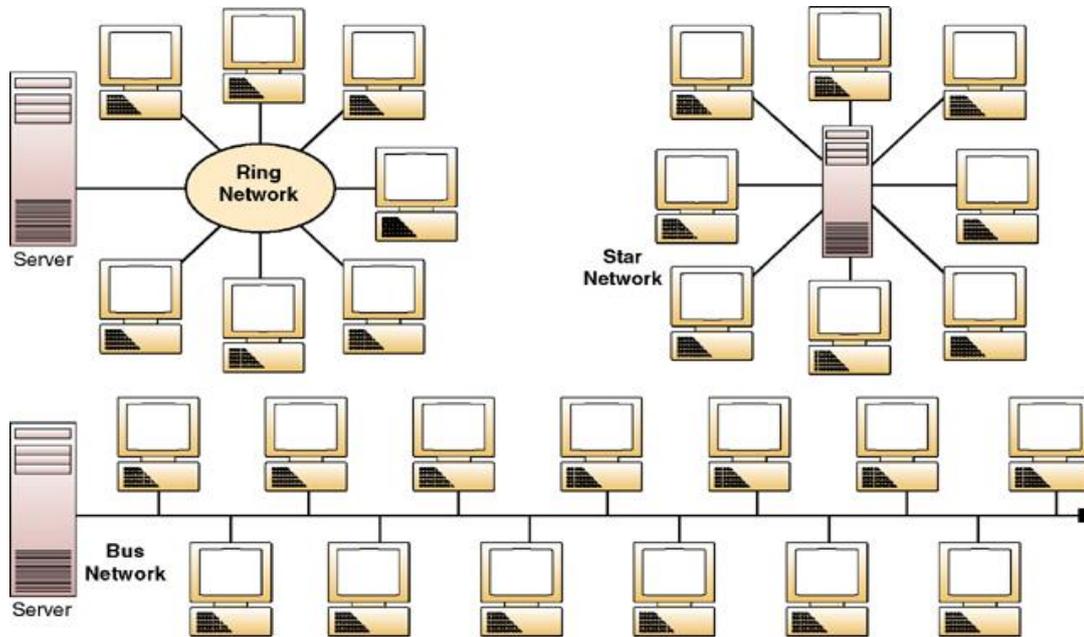
Network Management Software:

Software packages such as network operating systems and telecommunications monitors used to determine transmission priorities, route (switch) messages, poll terminals in the network, and form waiting lines (queues) of transmission requests.

- Traffic Management – manage network resources and traffic to avoid congestion and optimize service levels to users
- Security – provide authentication, encryption, firewall, auditing and enforcement

- Network Monitoring – troubleshoot and watch over the network, informing network administrators of potential problems before they occur
- Capacity Planning – survey network resources and traffic patterns and users’ needs to determine how best to accommodate the needs of the network as it grows and changes

Network Topologies



There are several basic types of network topologies, or structures, in telecommunications networks. Three basic topologies used in wide area and local area telecommunications networks are:

❖ Ring:

A ring network ties local computer processors together in a ring on a more equal basis.

❖ Star:

A star network ties end user computers to a central computer.

❖ Bus:

A bus network is a network in which local processors share the same bus, or communications channel.

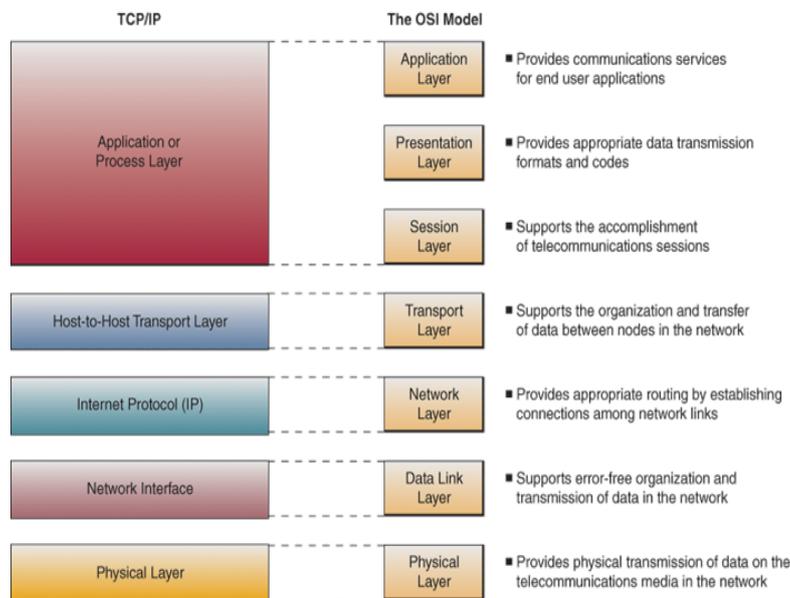
Network Architectures and Protocols

Protocols

- A standard set of rules & procedures for the control of communications in a network
- Standards for the physical characteristics of cables and connectors

Network Architectures - OSI:

The International Standards Organization (ISO) has developed a seven-layer Open Systems Interconnection (OSI) to serve as a standard model for network architectures in order to promote an open, simple, flexible, and efficient telecommunications environment.



The *International Standards Organization* (ISO) has developed a seven-layer Open Systems Interconnection (OSI) model to serve as a standard model for network architecture.

Application Layer. This layer provides communications services for end user applications.

Presentation Layer. This layer provides appropriate data transmission formats and codes.

Session Layer. This layer supports the accomplishment of telecommunications sessions.

Transport Layer. This layer supports the organization and transfer of data between nodes in the network.

Network Layer. This layer provides appropriate routing by establishing connections among network links.

Data Link Layer. This layer supports error free organization and transmission of data in the network.

Physical Layer. This layer provides physical access to the telecommunications media in the network.

Network Architectures - TCP/IP:

The Internet's protocol suite is called Transmission Control Protocol/Internet Protocol (TCP/IP). TCP/IP consists of five levels of protocols that can be related to the seven layers of the OSI architecture. TCP/IP is used by the Internet and all intranets and extranets.

Bandwidth Alternatives

The communications speed and capacity of telecommunications networks can be classified by bandwidth. This is the frequency range of a telecommunications channel; it determines the channel's maximum transmission rate (voice band, medium-band, and broadband).

- Bandwidth is the frequency range of a telecommunications network
- Determines the channel's maximum transmission rate
- Measured in bits per second (bps) or baud
- Narrow-band
 - Low-speed transmission
- Broadband
 - High-speed transmission

Switching Alternatives:

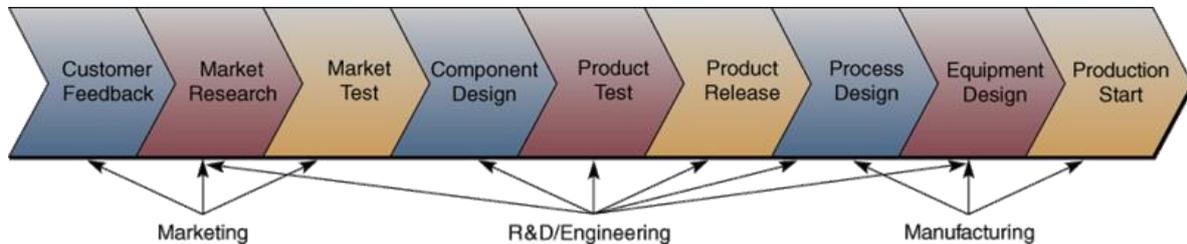
In telecommunications transmission, a variety of switching alternatives exists. These include: circuit switching, message switching, packet switching, and cell switching.

- Circuit Switching
 - Switch opens a circuit to establish a link between a sender and receiver
 - it remains open until the communication session is completed
- Packet Switching
 - Break messages into groups called packets
 - Transmit packets separately

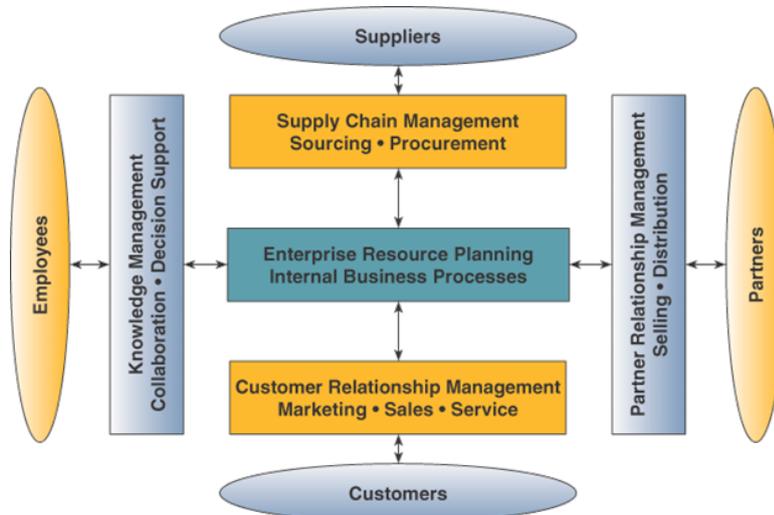
ELECTRONIC BUSINESS SYSTEMS

Cross-Functional Enterprise Applications

- ❖ Cross the boundaries of traditional business functions
 - Used to reengineer and improve vital business processes all across the enterprise



Enterprise Application Architecture



Enterprise Application Integration

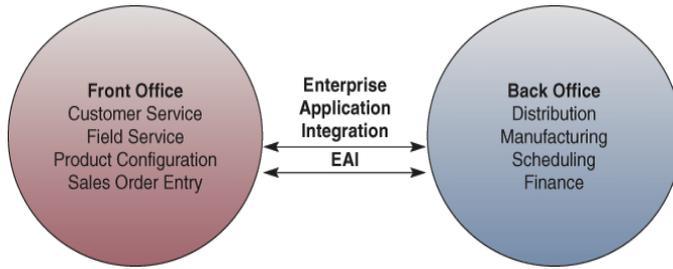
- EAI software connects cross-functional systems
- Serves as middleware to provide
 - Data conversion
 - Communication between systems
 - Access to system interfaces

Transaction Processing Systems

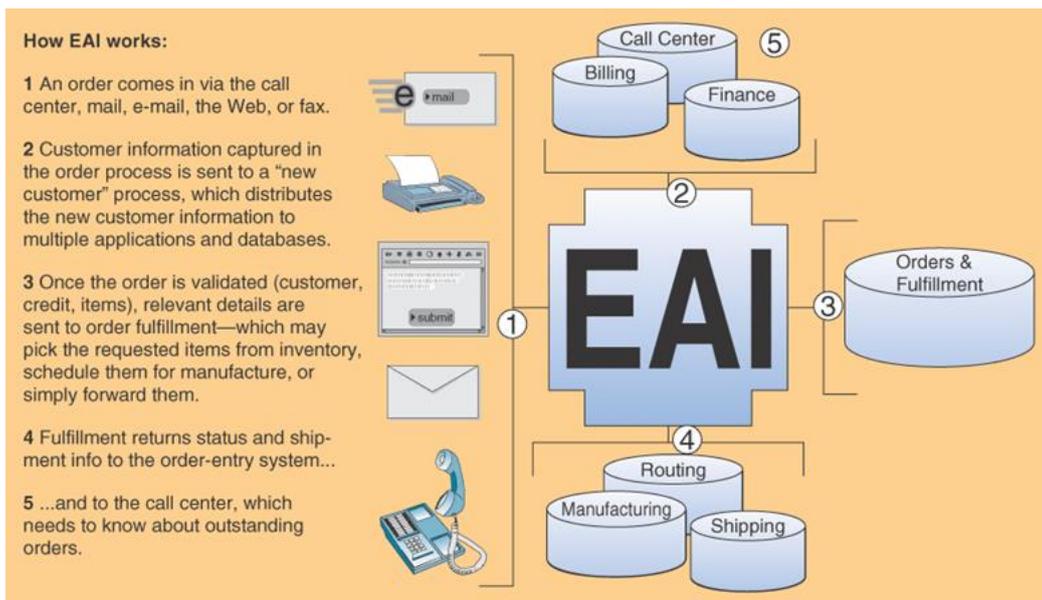
Transaction processing systems (TPS) are cross functional information systems that process data resulting from the occurrence of business transactions.

- **Transactions** include sales, purchases, deposits, withdrawals, refunds, and payments

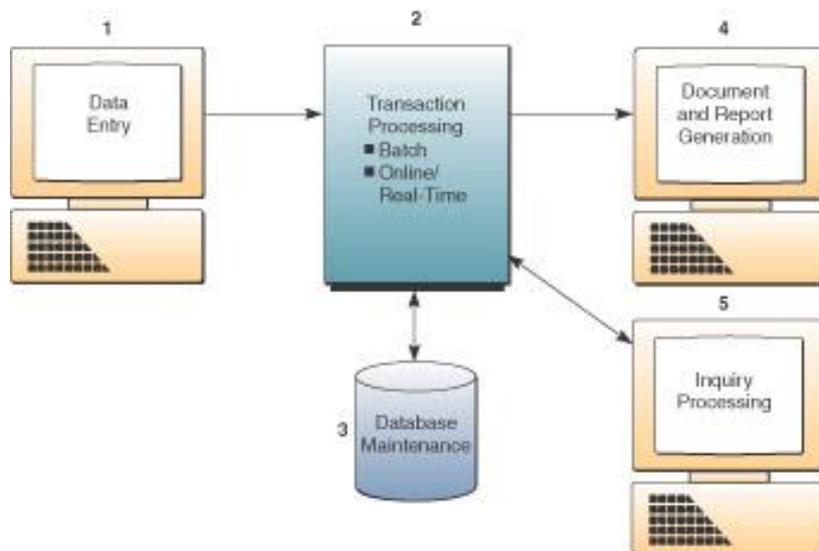
- **Online transaction processing (OLTP)** is a real-time system that captures transactions immediately



How EAI Works?



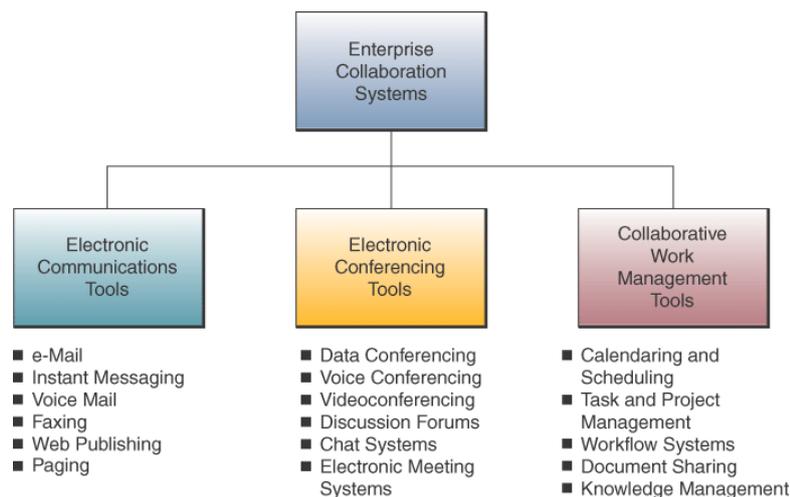
The Transaction Processing Cycle



Enterprise Collaboration Systems (ECS)

- EC systems are cross-functional information systems that enhance team and workgroup
 - Communication
 - Coordination
 - Collaboration
- Systems may include
 - Networked PC workstations
 - Servers
 - Databases
 - Groupware and application packages

ECS Tools



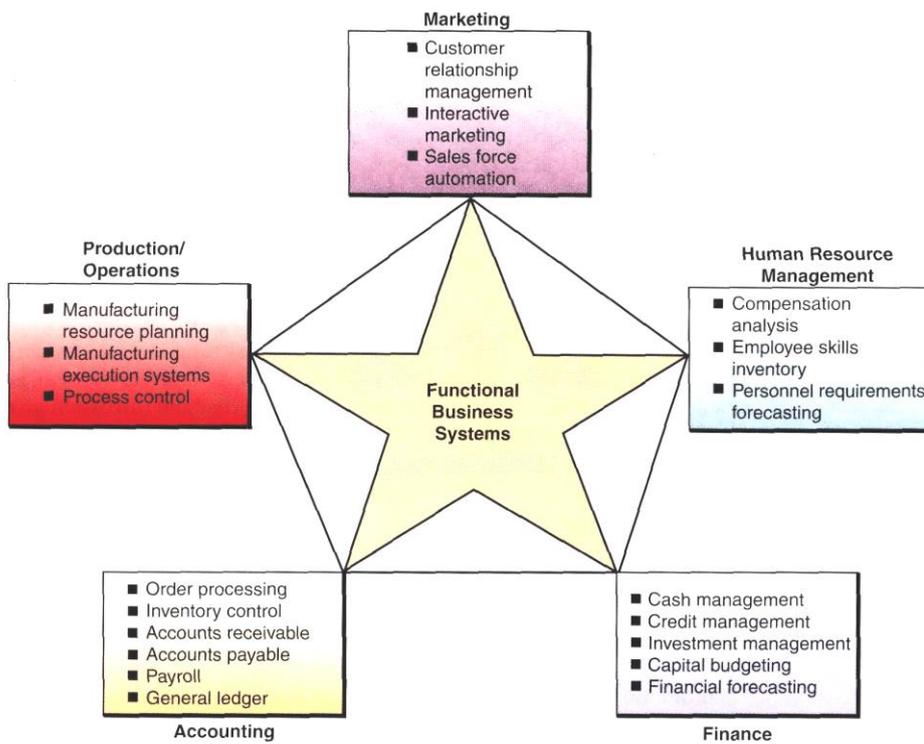
E-BUSINESS

E-business is the use of the Internet and other networks and information technologies to support electronic commerce, enterprise communications and collaboration, and Web-enabled business processes both within a networked enterprise, and with its customers and business partners.

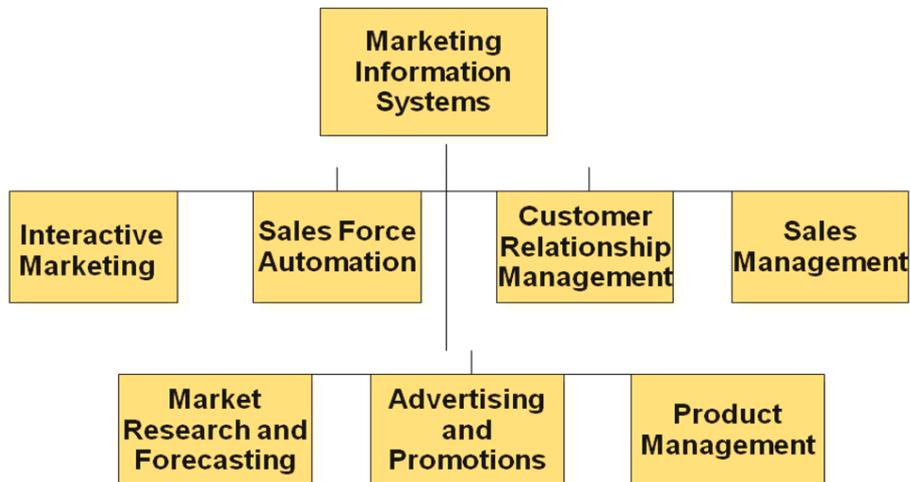
Information systems can be grouped into business function categories; however, in the real world information systems are typically integrated combinations of functional information systems.

Functional business systems are composed of a variety of types of information systems (transaction processing, management information, decision support, etc) that support the business functions of:

- ❖ Accounting
- ❖ Finance
- ❖ Marketing
- ❖ Productions/operations management
- ❖ Human resource management



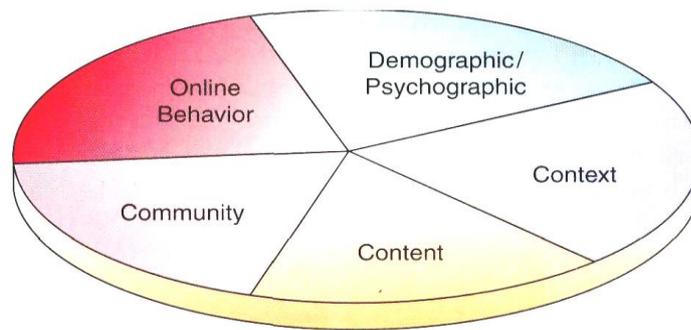
Marketing Information Systems



Marketing Information Systems integrate the information flow required by many marketing activities. Marketing information systems provide information for: Internet/intranet web sites and services make an *interactive marketing* process possible where customers can become partners in creating, marketing, purchasing, and improving products and services.

Sales force automation systems use mobile computing and Internet technologies to automate many information processing activities for sales support and management. Other marketing systems assist marketing managers in product planning, pricing, and other product management decisions, advertising and sales promotion strategies, and market research and forecasting.

Targeted Marketing:



Targeted marketing has become an important tool in developing advertising and promotion strategies for a company's electronic commerce websites. Target marketing is an advertising and promotion management concept that includes five targeting components:

Community – companies can customize their web advertising messages and promotion methods to appeal to people in specific communities. These can be communities of interest, such as virtual communities of online sporting enthusiasts or arts and crafts hobbyists, or geographic communities formed by the websites of a city or local newspaper.

Content – advertising such as electronic billboards or banners can be placed on various website pages, in addition to a company's home page. These messages reach the targeted audience.

Context – advertising appears only in web pages that are relevant to the content of a product or service. So advertising is targeted only at people who are already looking for information about a subject matter that is related to a company's products.

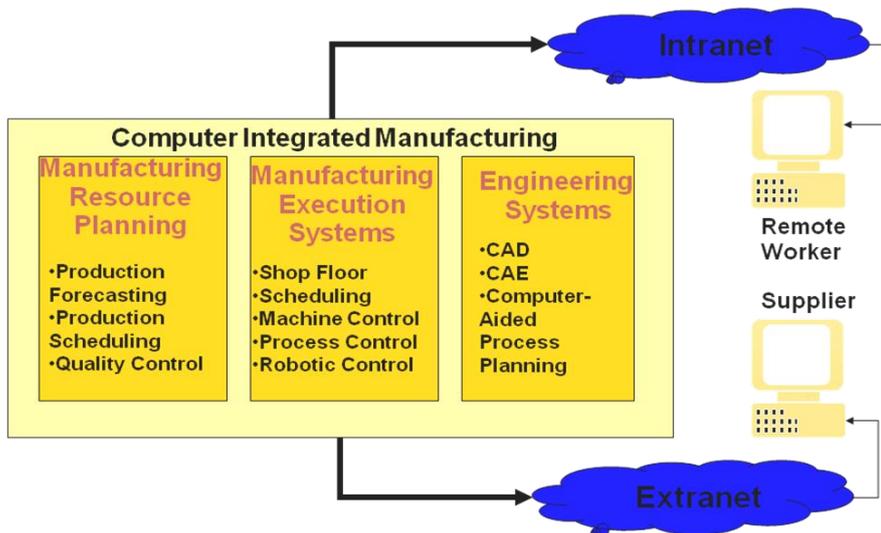
Demographic/Psychographic – marketing efforts can be aimed only at specific types or classes of people: unmarried, twenty-something, middle income, and male college graduates.

Online Behavior – advertising and promotion efforts can be tailored to each visit to a site by an individual. This strategy is based on "web cookie" files recorded on the visitor's disk drive from previous visits. Cookie files enable a company to track a person's online behavior at a website so marketing efforts can be instantly developed and targeted to that individual at each visit to their website.

Manufacturing information systems

Manufacturing information systems support the *production/operations* function, which includes all activities concerned with the planning and control of the processes that produce goods or services. The production/operations function is concerned with the management of the operational systems of all business firms. Information systems used for operations management and transaction processing support all firms that must plan, monitor, and control inventories, purchases, and the flow of goods and services.

Computer-Integrated Manufacturing (CIM):



Computer-based manufacturing information systems use several major techniques to support computer-integrated manufacturing (CIM). CIM is an overall concept that stresses that the goals of computer use in factory automation must be to:

- **Simplify** - (reengineer) production processes, product designs, and factory organization as a vital foundation to automation and integration.
- **Automate** - Production processes and the business functions that support them with computers, machines, and robots.
- **Integrate** - All production and support processes using computers, telecommunications networks, and other information technologies.

Human resource management

- Planning to meet the future needs of the organization
- Development of employees to their full potential
- Control of all personnel policies and programs



HRM and the Internet:

The Internet has become a major force for change in human resource management. For example, companies are:

- Recruiting for employees through recruitment sections of their corporate web sites.

- Using commercial recruiting services and databases on the World Wide Web, posting messages in selected Internet newsgroups, and communicating with job applicants by Internet e-mail.

Staffing the Organization

The staffing function must be supported by information systems that record and track human resources within a company to maximize their use. These systems are used in personnel record keeping systems, employee skills inventory systems, and personnel requirements forecasting systems. Examples:

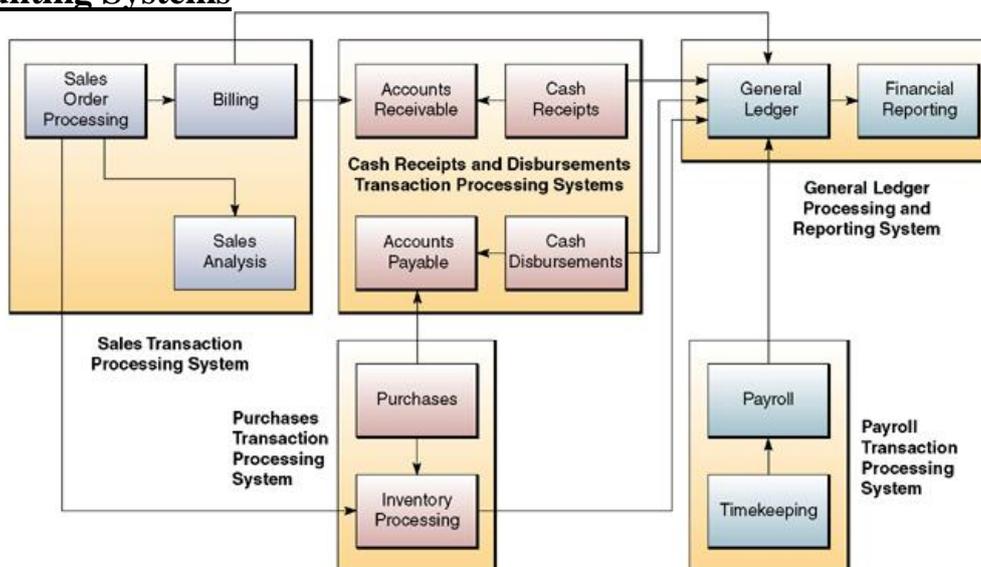
- Personnel record keeping system keeps track of additions, deletions, and other changes to the records in a personnel database.
- Changes in job assignments and compensation, or hiring and terminations
- Employee skills inventory system that uses the employee skill data from a personnel database to locate employees within a company who have the skills required for specific assignments and projects.
- Forecasting personnel requirements to assure a business an adequate supply of high-quality human resources.

Training and Development:

Information systems help human resource managers:

- Plan and monitor employee recruitment, training, performance appraisals, and career development by analyzing the success history of present programs.
- Analyze the career development status of each employee to determine whether

Accounting Systems



■ Accounting Systems

- Online Accounting Systems
- Order Processing
- Inventory Control Systems

- Accounts Receivable
- Accounts Payable
- Payroll
- General Ledger

Online Accounting Systems:

Accounting information systems are being affected by Internet and client/server technologies. Using the Internet, intranets, extranets, and other network changes how accounting information systems monitor and track business activity. The online, interactive nature of such networks calls for new forms of transaction documents, procedures, and controls.

Order Processing: Order processing or sales order processing, is an important transaction processing system that captures and processes customer orders and produces data needed for sales analysis and inventory control. In many firms, it also keeps track of the status of customer orders until goods are delivered. Computer-based sales order processing systems: Provide a fast, accurate, and efficient method of recording and screening customer orders and sales transactions. Provide inventory control systems with information on accepted orders so they can be filled as quickly as possible.

Inventory Control: Inventory control systems process data reflecting changes to items in inventory. A computer-based inventory control system:

- Record changes to inventory levels and prepares appropriate shipping documents.
- May notify managers about items that need reordering and provide them with a variety of inventory status reports.
- Helps a business provide high-quality service to customers while minimizing investment in inventory and inventory carrying costs.

Accounts Receivable: Accounts receivable systems keep records of amounts owed by customers from data generated by customer purchases and payments. Accounts receivable systems: Produce invoices to customers, monthly customer statements and credit management reports. Stimulate prompt customer payments by preparing accurate and timely invoices and monthly statements to credit customers.

Accounts Payable: Accounts payable systems keep track of data concerning purchases from and payments to suppliers. Accounts payable systems: Prepare checks in payment of outstanding invoices and produce cash management reports. Help ensure prompt and accurate payment of suppliers to maintain good relationships, ensure a good credit standing, and secure any discounts offered for prompt payment. Provide tight financial control over all cash disbursements of the business.

Payroll: Payroll systems receive and maintain data from employee time cards and other work records. Accounts payable systems: Produce paychecks and other documents such as earning statements, payroll reports, and labor analysis reports Product reports for management and government agencies.

General Ledger: General ledger systems consolidate data from accounts receivable, accounts payable, payroll, and other accounting information systems. General ledger systems: At the end of each accounting period, these systems produce the general ledger trial balance, the income statement and balance sheet of the firm, and various income and expense reports for management.

UNIT III

Electronic Commerce Systems: Electronic Commerce Fundamentals – e-Commerce Applications and Issues Enterprise Business Systems: Getting All the Geese Lined Up: Managing at the Enterprise Level – Enterprise Resource Planning: The Business Backbone

E COMMERCE;

E commerce is any form of business transaction in any form of business transaction which the parties interact electronically rather than by physical exchanges or direct physical contact.

Definition;

E commerce is the use of electronic communications and digital information processing technology in business transactions to create, transform, and redefine relationships for value creation between or among organizations, and between organizations and individuals

E-commerce is changing the shape of competition, the speed of action, and the streamlining of interactions, products, and payments from customers to companies and from companies to suppliers.

Categories of e commerce;

Many companies today are participating in or sponsoring four basic categories of e-commerce applications: business-to-consumer, business-to-business, consumer to- consumer, and business-to-government e-commerce.

Business to consumer (B2C);

In this form of e-commerce, businesses must develop attractive electronic marketplaces to sell products and services to consumers.

Consumer-to-Consumer (C2C)

The huge success of online auctions like eBay, where consumers (as well as businesses) can buy from and sell to one another in an auction process at an auction Web site, makes this e-commerce model an important e-commerce business strategy.

Business-to-Business (B2B)

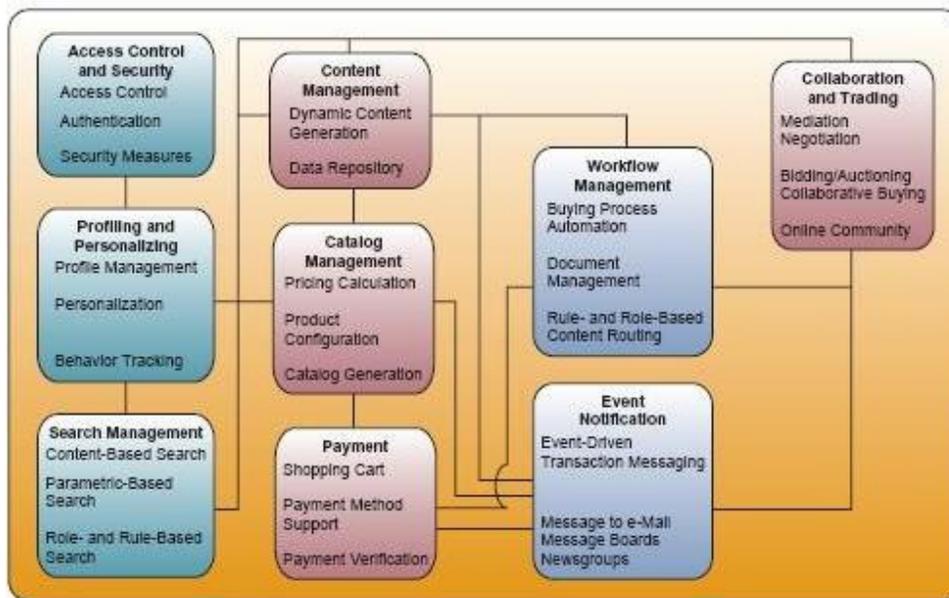
This category of e-commerce involves both e-business marketplaces and direct market links between businesses. For example, many companies offer secure Internet or extranet e-commerce catalog Web sites for their business customers and suppliers.

ESSENTIAL OF E COMMERCE PROCESS;

The essential e-commerce processes required for the successful operation and management of e-commerce activities are illustrated in below diagram . This figure outlines the nine key components of an e-commerce process architecture that is the foundation of the e-commerce initiatives of many companies today.

. An example would be an intranet-based human resource system used by a company's employees, which might use all but the catalog management and product payment processes shown in below diagram. Let's take a brief look at each essential process category.

FIGURE 8.4 This e-commerce process architecture highlights nine essential categories of e-commerce processes.



Access control and security;

E-commerce processes must establish mutual trust and secure access between the parties in an e-commerce transaction by authenticating users, authorizing access, and enforcing security features. For example, these processes establish that a customer and e-commerce site are who they say they are through user names and passwords, encryption keys, or digital certificates and signatures. The e-commerce site must then authorize access to only those parts of the site that an individual user needs to accomplish his or her particular transactions. Thus, you usually will be given access to all resources of an e-commerce site except for other people's accounts and restricted company data.

Profiling and Personalizing;

Once you have gained access to an e-commerce site, profiling processes can occur that

gather data on you and your Web site behavior and choices, as well as build electronic profiles of your characteristics and preferences. User profiles are developed using profiling tools such as user registration, cookie files, Web site behavior tracking software, and user feedback. These profiles are then used to recognize you as an individual user and provide you with a personalized view of the contents of the site, as well as product recommendations and personalized Web advertising as part of a *one-to-one marketing* strategy

Search Management;

Efficient and effective search processes provide a top e-commerce Web site capability that helps customers find the specific product or service they want to evaluate or buy. E-commerce software packages can include a Web site search engine component, or a company may acquire a customized e-commerce search engine from search technology companies like Google and Requisite Technology.

Content and catalog

Content management software helps e-commerce companies develop, generate, deliver, update, and archive text data and multimedia information at e-commerce Web sites. E-Commerce content frequently takes the form of multimedia catalogs of product information. As such, generating and managing catalog content is a major subset of content management, or catalog management.

Workflow Management

Many of the business processes in e-commerce applications can be managed and partially automated with the help of workflow management software. E-business workflow systems for enterprise collaboration help employees electronically collaborate to accomplish structured work tasks within knowledge-based business processes. Workflow management in both e-business and e-commerce depends on a *workflow software engine* containing software models of the business processes to be accomplished. The workflow models express the predefined sets of business rules, roles of stakeholders, authorization requirements, routing alternatives, databases used, and sequence of tasks required for each e-commerce process. Thus, workflow systems ensure that the proper transactions, decisions, and work activities are performed, and the correct data and documents are routed to the right employees, customers, suppliers, and other business stakeholders.

Event notifications

Event notification software works with workflow management software to monitor all e-

commerce processes and record all relevant events, including unexpected changes or problem situations. Then it works with user-profiling software to notify all involved stakeholders automatically of important transaction events using appropriate user-preferred methods of electronic messaging, such as e-mail, newsgroup, pager, and fax communications. This notification includes a company's management, who then can monitor their employees' responsiveness to e-commerce events and customer and supplier feedback.

For example, when you purchase a product at a retail e-commerce Web site like Amazon.com , you automatically receive an e-mail record of your order. Then you may receive e-mail notifications of any change in product availability or shipment status and, finally, an e- mail message notifying you that your order has been shipped and is complete.

Collaboration and trading

This major category of e-commerce processes consists of those that support the vital collaboration arrangements and trading services needed by customers, suppliers, and other stakeholders to accomplish e-commerce transactions.

ELECTRONIC PAYMENT PROCESS

Payment for the products and services purchased is an obvious and vital set of processes in e-commerce transactions. Payment processes, however, are not simple because of the nearly anonymous electronic nature of transactions taking place between the networked computer systems of buyers and sellers and the many security issues involved. E-commerce payment processes are also complex because of the wide variety of debit and credit alternatives, as well as the financial institutions and intermediaries that may be part of the process. Therefore, a variety of electronic payment systems have evolved over time.

Web payment process;

Most e-commerce systems on the Web involving businesses and consumers (B2C) depend on credit card payment processes, but many B2B e-commerce systems rely on more complex payment processes based on the use of purchase orders. However, both types of e-commerce typically use an electronic *shopping cart* process, which enables customers to select products from Web site catalog displays and put them temporarily in a virtual shopping basket for later checkout and processing.

Electronic Fund Transfer

Electronic funds transfer (EFT) systems are a major form of electronic payment systems in

banking and retailing industries. EFT systems use a variety of information technologies to capture and process money and credit transfers between banks and businesses and their customers.

Secure Electronic Payments

When you make an online purchase on the Internet, your credit card information is vulnerable to interception by network sniffers, software that easily recognizes credit card number formats. Several basic security measures are being used to solve this security problem:

- (1) Encrypt (code and scramble) the data passing between the customer and merchant,
- (2) Encrypt the data passing between the customer and the company authorizing the credit card transaction, or
- (3) Take sensitive information offline.

For example, many companies use the Secure Socket Layer (SSL) security method developed by Netscape Communications that automatically encrypts data passing between your Web browser and a merchant's server. However, sensitive information is still vulnerable to misuse once it's decrypted (decoded and unscrambled) and stored on a merchant's server, so a digital wallet payment system was developed. In this method, you add security software add-on modules to your Web browser. That enables your browser to encrypt your credit card data in such a way that only the bank that authorizes credit card transactions for the merchant gets to see it. All the merchant is told is whether your credit card transaction is approved or not. The Secure Electronic Transaction (SET) standard for electronic payment security extends this digital wallet approach. In this method, software encrypts a digital envelope of digital certificates specifying the payment details for each transaction. VISA, MasterCard, IBM, Microsoft, Netscape, and most other industry players have agreed to SET. Therefore, a system like SET may become the standard for secure electronic payments on the Internet.

E COMMERCE APPLICATIONS AND ISSUES

E commerce trends;

B2C e-commerce is also moving toward a self-service model in which customers configure and customize the products and services they wish to buy, aided by configuration software and online customer support as needed.

B2B e-commerce participants moved quickly from self-service on the Web to

configuration and customization capabilities and extranets connecting trading partners. B2B is also trending toward the use of e-commerce portals that provide catalog, exchange, and auction markets for business customers within or across industries. Of course, both of these trends are enabled by e-business capabilities like customer relationship management and supply chain management, which are the hallmarks of the customer-focused and internetworked supply chains of a fully e-business-enabled company.

B2B e-commerce participants moved quickly from self-service on the Web to configuration and customization capabilities and extranets connecting trading partners. As B2C e-commerce moves toward full-service and wide-selection retail Web portals, B2B is also trending toward the use of e-commerce portals that provide catalog, exchange, and auction markets for business customers within or across industries. Of course, both of these trends are enabled by e-business capabilities like customer relationship management and supply chain management, which are the hallmarks of the customer-focused and internetworked supply chains of a fully e-business-enabled company.

BUSINESS 2 CONSUMER COMMERCE;

E-commerce applications that focus on the consumer share an important goal: to attract potential buyers, transact goods and services, and build customer loyalty through individual courteous treatment and engaging community features.

B2B e-commerce participants moved quickly from self-service on the Web to configuration and customization capabilities and extranets connecting trading partners. As B2C e-commerce moves toward full-service and wide-selection retail Web portals, B2B is also trending toward the use of e-commerce portals that provide catalog, exchange, and auction markets for business customers within or across industries. Of course, both of these trends are enabled by e-business capabilities like customer relationship management and supply chain management, which are the hallmarks of the customer-focused and internetworked supply chains of a fully e-business-enabled company.

E COMMERCE SUCCESS FACTORS

On the Internet, the barriers of time, distance, and form are broken down, and businesses are able to transact the sale of goods and services 24 hours a day, 7 days a week, 365 days a year with consumers all over the world. In certain cases, it is even possible to convert a physical good (CDs, packaged software, a newspaper) to a virtual good (MP3 audio, downloadable

software, information in HTML format).

Selection and Value

Obviously, a business must offer Web shoppers a good selection of attractive products and services at competitive prices, or the shoppers will quickly click away from a Web store. However, a company's prices don't have to be the lowest on the Web if it builds a reputation for high quality, guaranteed satisfaction, and top customer support while shopping and after the sale. For example, top-rated e-tailer REI.com helps you select quality outdoor gear for hiking and other activities with a -How to Choose section and gives a money-back guarantee on your purchases

Performance and Service

People don't want to be kept waiting when browsing, selecting, or paying in a Web store. A site must be efficiently designed for ease of access, shopping, and buying, with sufficient server power and network capacity to support Web site traffic. Web shopping and customer service must also be friendly and Helpful, as well as quick and easy. In addition, products offered should be available in inventory for prompt shipment to the customer.

Look and Feel

B2C sites can offer customers an attractive Web storefront, shopping areas, and multimedia product catalogs. These could range from an exciting shopping experience with audio, video, and moving graphics to a more simple and comfortable look and feel. Thus, most retail e-commerce sites let customers browse product sections, select products, drop them into a virtual shopping cart, and go to a virtual checkout station when they are ready to pay for their order.

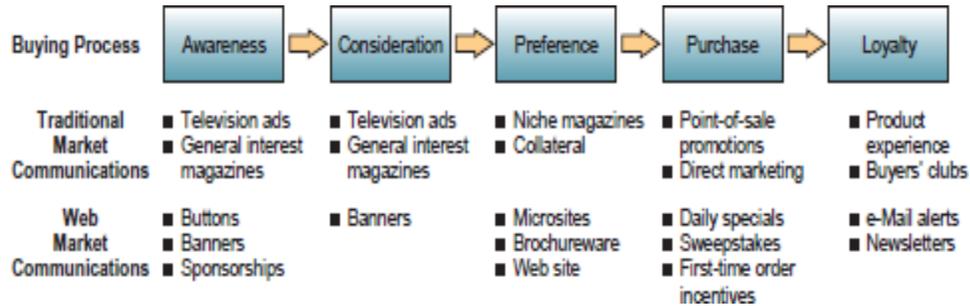
Advertising and Incentives

Some Web stores may advertise in traditional media, but most advertise on the Web with targeted and personalized banner ads and other Web page and e-mail promotions. Most B2C sites also offer shoppers incentives to buy and return. Typically, these incentives mean coupons, discounts, special offers, and vouchers for other Web services, sometimes with other e-tailers at cross-linked Web sites. Many Web stores also increase their market reach by being part of Web banner advertising exchange programs with thousands of other Web retailers.

Personal Attention.

Personalizing your shopping experience encourages you to buy and make return visits. Thus, e-commerce software can automatically record details of your visits and build user

profiles of you and other Web shoppers. Many sites also encourage you to register with them and fill out a personal interest profile. Then, whenever you return, you are welcomed by name or with a personal Web page, greeted with special offers, and guided to those parts of the site in which you are most interested. This *one-to-one marketing* and relationship building power is one of the major advantages of personalized Web retailing.



Community Relationships

Giving online customers with special interests a feeling of belonging to a unique group of like-minded individuals helps build customer loyalty and value. Thus, Web site relationship and affinity marketing programs build and promote virtual communities of customers, suppliers, company representatives, and others via a variety of Web-based collaboration tools. Examples include discussion forums or newsgroups, chat rooms, message board systems, and cross-links to related Web site communities.

Security and Reliability

As a customer of a successful Web store, you must feel confident that your credit card, personal information, and details of your transactions are secure from unauthorized use. You must also feel that you are dealing with a trustworthy business whose products and other Web site information you can trust to be as advertised. Having your orders filled and shipped as you requested, in the time frame promised, and with good customer support are other measures of an e-tailer's reliability.

Great Customer Communications

As more consumers shift their habits from the traditional bricks and mortar approach to an online shopping experience, one thing becomes even more important than ever: the need for constant and informative communication channels with the customer. Despite the conveniences associated with online shopping, consumers still have questions that need to be answered by a human being. Issues ranging from product information to order status or modification are often still handled the -old fashioned way. Land's End, the famous

outdoor clothing retailer, provides telephone and chat space access to customer representatives that will even help you pick out your purchases in real time.

BUSINESS 2 BUSINESS E COMMERCE

Business-to-business e-commerce is the wholesale and supply side of the commercial process, where businesses buy, sell, or trade with other businesses. B2B e-commerce relies on many different information technologies, most of which are implemented at e-commerce Web sites on the World Wide Web and corporate intranets and extranets. B2B applications include electronic catalog systems, electronic trading systems such as exchange and auction portals, electronic data interchange, electronic funds transfers, and so on.

In addition, many businesses are integrating their Web-based e-commerce systems with their e-business systems for supply chain management, customer relationship management, and online transaction processing, as well as with their traditional, or legacy, computer-based accounting and business information systems. This integration ensures that all e-commerce activities are integrated with e-business processes and supported by up-to-date corporate inventory and other databases, which in turn are automatically updated by Web sales activities.

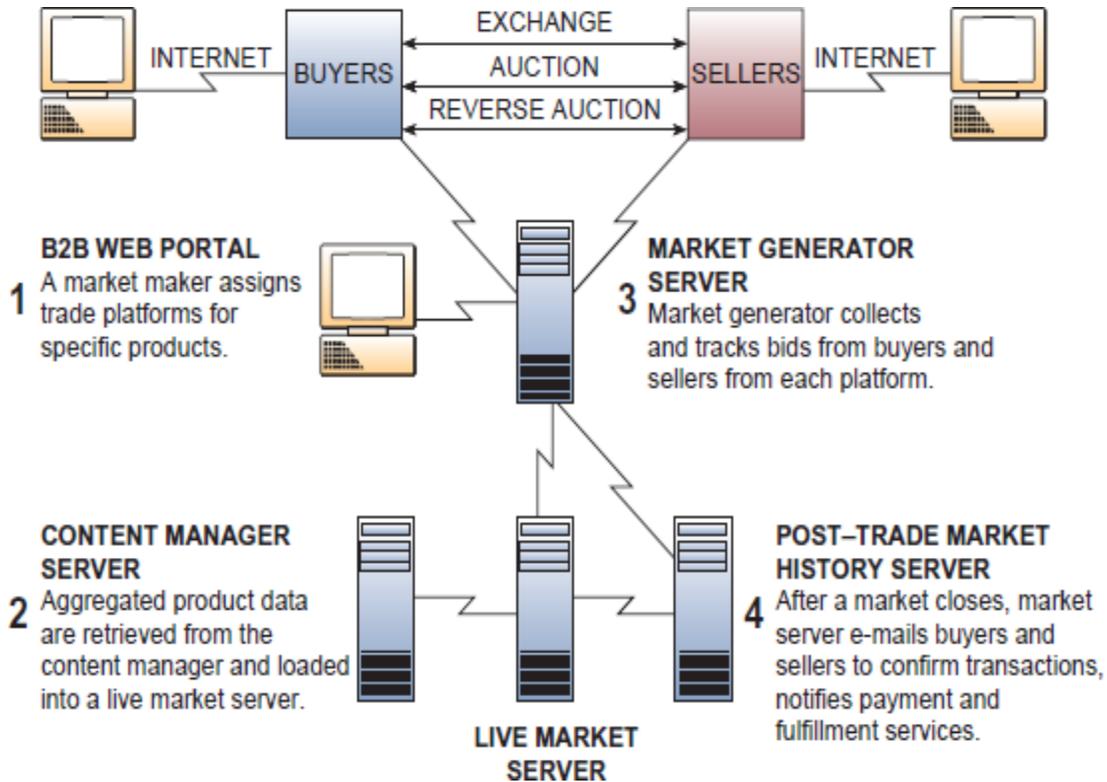
E COMMERCE MARKET PLACES

Businesses of any size can now buy everything from chemicals to electronic components, excess electrical energy, construction materials, or paper products at business-to-business e-commerce marketplaces. The following diagram outlines five major types of e-commerce marketplaces used by businesses today. However many B2B portals provide several market places. Thus, they may offer an electronic catalog shopping and ordering site for products from many suppliers in an industry. Or they may serve as an exchange for buying and selling via a bid-ask process or at negotiated prices. Very popular are electronic auction Web sites for B2B auctions of products and services.

TYPES OF E COMMERCE MARKET PLACES;

e-Commerce Marketplaces	
•	One to Many. Sell-side marketplaces. Host one major supplier, who dictates product catalog offerings and prices. Examples: Cisco.com and Dell.com.
•	Many to One. Buy-side marketplaces. Attract many suppliers that flock to these exchanges to bid on the business of a major buyer like GE or AT&T.
•	Some to Many. Distribution marketplaces. Unite major suppliers who combine their product catalogs to attract a larger audience of buyers. Examples: VerticalNet and Works.com.
•	Many to Some. Procurement marketplaces. Unite major buyers who combine their purchasing catalogs to attract more suppliers and thus more competition and lower prices. Examples: the auto industry.
•	Many to Many. Auction marketplaces used by many buyers and sellers that can create a variety of buyers' or eBay and FreeMarkets.

The following diagram illustrates a B2B trading system that offers exchange, auction, and reverse auction (where sellers bid for the business of a buyer) electronic markets.



Many of these B2B **e-commerce portals** are developed and hosted by third-party *market-maker* companies who serve as infomediaries that bring buyers and sellers together in catalog, exchange, and auction markets. Infomediaries are companies that serve as intermediaries in e-business and e-commerce transactions.

These B2B e-commerce sites make business purchasing decisions faster, simpler, and more cost-effective because companies can use Web systems to research and transact with many vendors. Business buyers get one-stop shopping and accurate purchasing information. They also get impartial advice from infomediaries that they can't get from the sites hosted by suppliers and distributors. Thus, companies can negotiate or bid for better prices from a larger pool of vendors.

ENTERPRISE BUSINESS SYSTEM;

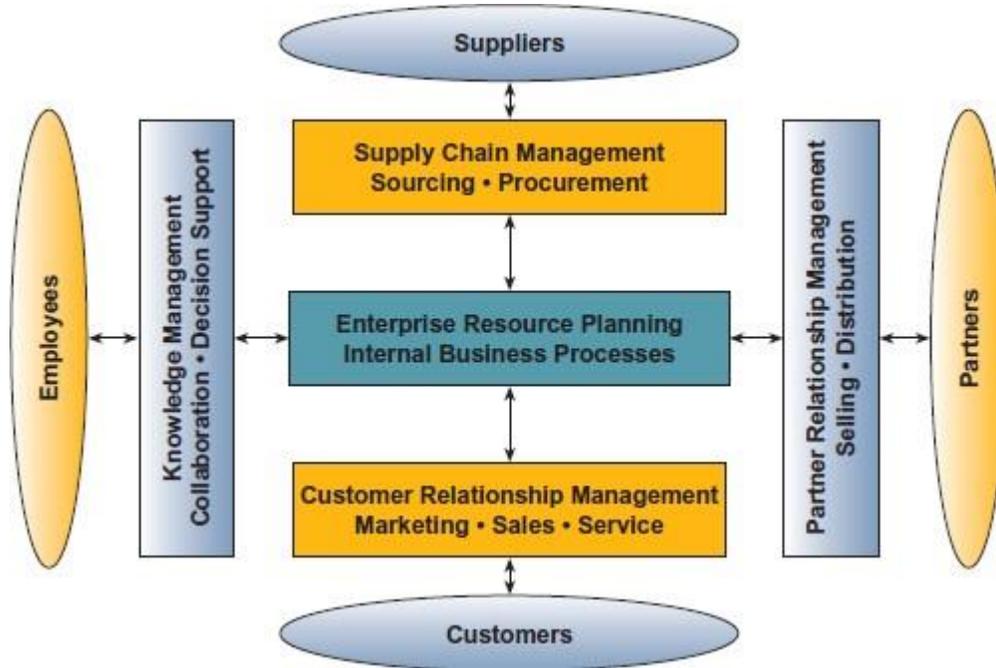
Enterprise Application Architecture;

The following diagram shows enterprise application architecture , which illustrates the interrelationships of the major cross-functional enterprise applications that many companies have or are installing today. This architecture is not intended as a detailed or exhaustive application blueprint but rather as a conceptual framework to help you visualize the basic components, processes, and interfaces of these major e-business applications, along with their interrelationships. This application architecture also spotlights the roles these business systems play in supporting the customers, suppliers, partners, and employees of a business.

Notice that instead of concentrating on traditional business functions, or only supporting the internal business processes of a company, enterprise applications are focused on accomplishing fundamental business processes in concert with a company's customer, supplier, partner, and employee stakeholders. Thus, enterprise resource planning (ERP) concentrates on the efficiency of a firm's internal production, distribution, and financial processes.

Customer relationship management (CRM) focuses on acquiring and retaining profitable customers via marketing, sales, and service processes. Partner relationship management (PRM) aims at acquiring and retaining partners who can enhance the selling and distribution of a firm's products and services. Supply chain management (SCM) focuses on developing the most efficient and effective sourcing and procurement processes with suppliers

for the products and services needed by a business. Knowledge management (KM) applications focus on providing a firm's employees with tools that support group collaboration and decision support.



CUSTOMER RELATIONSHIP MANAGEMENT

Customer relationship management (CRM) is a system for managing a company's interactions with current and future customers. It often involves using technology to organize, automate and synchronize sales, marketing, customer service, and technical support.

CRM uses information technology to create a cross-functional enterprise system that integrates and automates many of the *customer-serving* processes in sales, marketing, and customer services that interact with a company's customers. CRM systems also create an IT framework of Web-enabled software and databases that integrates these processes with the rest of a company's business operations.

CRM systems include a family of software modules that provides the tools that enable a business and its employees to provide fast, convenient, dependable, and consistent service to its customers.

Contact and Account management

CRM software helps sales, marketing, and service professionals capture and track relevant

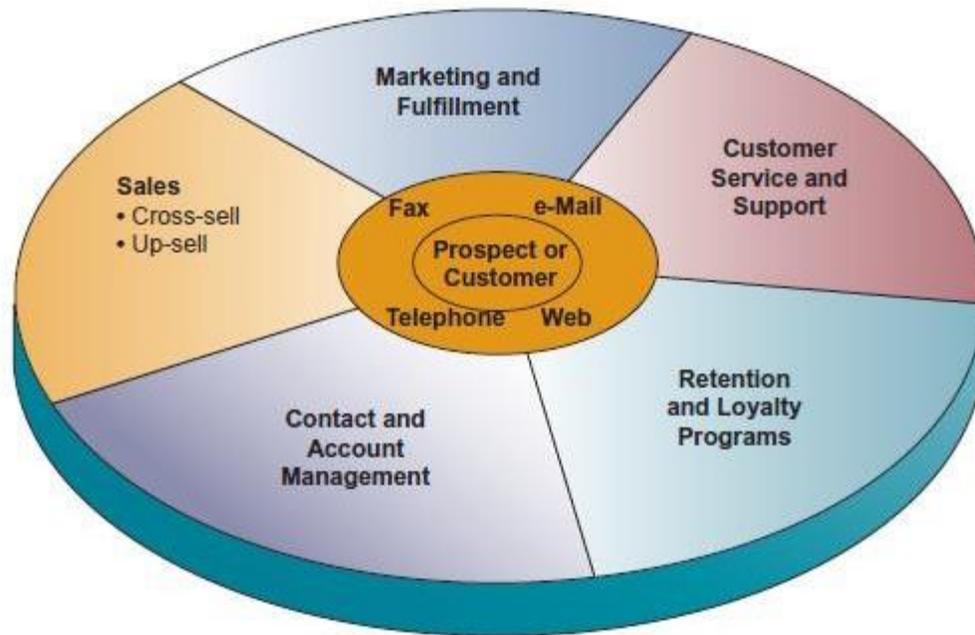
data about every past and planned contact with prospects and customers, as well as other business and life cycle events of customers. Information is captured from all customer *touch points*, such as telephone, fax, e-mail, the company's Web site, retail stores, kiosks, and personal contact. CRM systems store the data in a common customer database that integrates all customer account information and makes it available Throughout the company via Internet, intranet, or other network links for sales, marketing, service, and other CRM applications.

Sales

A CRM system provides sales representatives with the software tools and company data sources they need to support and manage their sales activities and optimize *cross-selling* and *up-selling* . Cross-selling is an approach in which a customer of one product or service, say, auto insurance, might also be interested in purchasing a related product or service, say, homeowner's insurance. By using a cross-selling technique, sales representatives can better serve their customers while simultaneously improving their sales. Up-selling refers to the process of finding ways to sell a new or existing customer a better product than they are currently seeking. Examples include sales prospect and product information, product configuration, and sales quote generation capabilities. CRM also provides real-time access to a single common view of the customer, enabling sales representatives to check on all aspects of acustomer's account status and history before scheduling their sales calls.

Marketing and fulfillment

CRM systems help marketing professionals accomplish direct marketing campaigns by automating such tasks as qualifying leads for targeted marketing and scheduling and tracking direct marketing mailings. Then the CRM software helps marketing professionals capture and manage prospect and customer response data in the CRM database and analyze the customer and business value of a company's direct marketing campaigns. CRM also assists in the fulfillment of prospect and customer responses and requests by quickly scheduling sales contacts and providing appropriate information about products and services to them, while capturing relevant information for the CRM database.



Customer Service and support

A CRM system provides service representatives with software tools and real-time access to the common customer database shared by sales and marketing professionals. CRM helps customer service managers create, assign, and manage requests for service by customers. *Call center* software routes calls to customer support agents on the basis of their skills and authority to handle specific kinds of service requests. *Help desk* software provides relevant service data and suggestions for resolving problems for customer service reps who assist customers with problems with a product or service. Web-based self-service enables customers to easily access personalized support information at the company Web site, while giving them an option to receive further assistance online or by phone from customer service personnel.

Retention and Loyalty Programs

Consider the following:

- It costs six times more to sell to a new customer than to sell to an existing one.
- A typical dissatisfied customer will tell eight to ten people about his or her experience.
- A company can boost its profits 85 percent by increasing its annual customer retention by only 5 percent.
- The odds of selling a product to a new customer are 15 percent, whereas the

odds of selling a product to an existing customer are 50 percent.

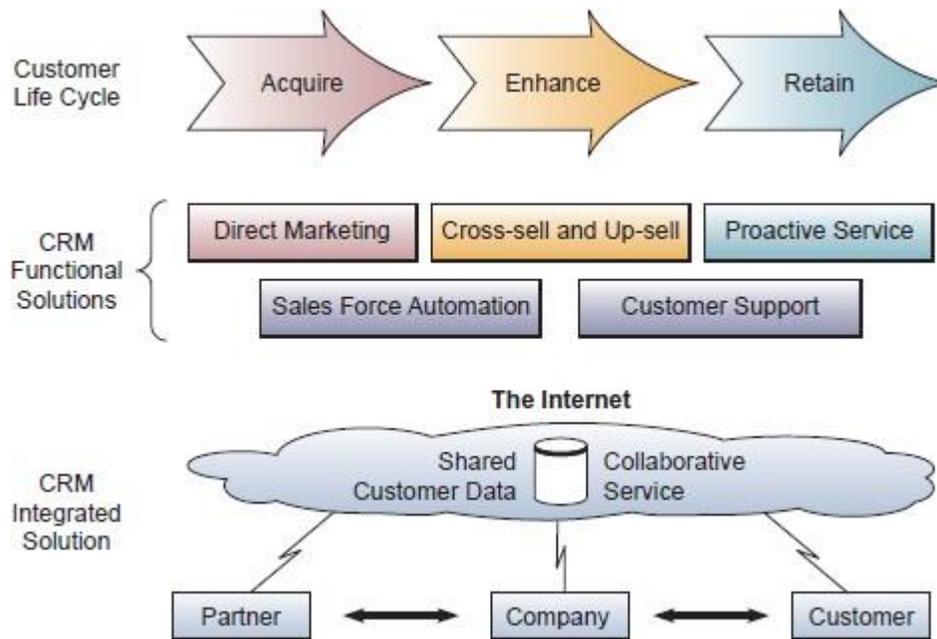
- Seventy percent of complaining customers will do business with the company again if it quickly takes care of a service problem.

That's why enhancing and optimizing customer retention and loyalty is a major business strategy and primary objective of customer relationship management. CRM systems try to help a company identify, reward, and market to their most loyal and profitable customers. CRM analytical software includes data mining tools and other analytical marketing software, and CRM databases may consist of a customer data warehouse and CRM data marts. These tools are used to identify profitable and loyal customers and to direct and evaluate a company's targeted marketing and relationship marketing programs toward them.

Three phases of CRM;

We can view CRM as an integrated system of Web-enabled software tools and databases that accomplish a variety of customer-focused business processes that support the three phases of the relationship between a business and its customers

- **Acquire.** A business relies on CRM software tools and databases to help it acquire new customers by doing a superior job of contact management, sales prospecting, selling, direct marketing, and fulfillment. The goal of these CRM functions is to help customers perceive the value of a superior product offered by an outstanding company.
- **Enhance.** Web-enabled CRM account management and customer service and support tools help keep customers happy by supporting superior service from a responsive, networked team of sales and service specialists and business partners. And CRM sales force automation and direct marketing and fulfillment tools help companies cross-sell and up-sell to their customers, thus increasing their profitability to the business. The value perceived by customers is the convenience of one-stop shopping at attractive prices.
- **Retain.** CRM analytical software and databases help a company proactively identify and reward its most loyal and profitable customers to retain and expand their business via targeted marketing and relationship marketing programs. The value perceived by customers is of a rewarding personalized business relationship with their company.



BENEFITS AND CHALLENGES OF CRM;

The potential business benefits of customer relationship management are many. For example, CRM allows a business to identify and target its best customers—those who are the most profitable to the business—so they can be retained as lifelong customers for greater and more profitable services. It makes possible real-time customization and personalization of products and services based on customer wants, needs, buying habits, and life cycles. CRM can also keep track of when a customer contacts the company, regardless of the contact point. In addition, CRM systems can enable a company to provide a consistent customer experience and superior service and support across all the contact points a customer chooses. All of these benefits would provide strategic business value to a company and major customer value to its customers.

CRM FAILURES;

The business benefits of customer relationship management are not guaranteed but instead have proven elusive for many companies. Surveys by industry research groups include a report that over 50 percent of CRM projects did not produce the results that were promised. In another research report, 20 percent of businesses surveyed reported that CRM implementations had actually damaged long-standing customer relationships. And in a survey of senior management satisfaction with 25 management tools, CRM ranked near the bottom in user satisfaction, even though 72 percent expected to have CRM systems implemented

shortly. What is the reason for such a high rate of failure or dissatisfaction with CRM initiatives? Research shows that the major reason is a familiar one: lack of understanding and preparation. That is, too often business managers rely on a major new application of information technology (like CRM) to solve a business problem without first developing the business process changes and change management programs that are required.

ENTERPRISE RESOURCE PLANNING

ERP is the technological backbone of e-business, an enterprise wide transaction framework with links into sales order processing, inventory management and control, production and distribution, planning, and finance .

Enterprise resource planning (ERP) is a cross-functional enterprise system driven by an integrated suite of software modules that supports the basic internal business processes of a company. For example, ERP software for a manufacturing company will typically process the data from, and track the status of, sales, inventory, shipping, and invoicing, as well as forecast raw material and human resource requirements.

The below diagram presents the major application components of an ERP system.



ERP gives a company an integrated real-time view of its core business processes, such as production, order processing, and inventory management, tied together by the ERP application software and a common database maintained by a database management system. ERP systems track business resources (e.g., cash, raw materials, production capacity) and the status of commitments made by the business (e.g., customer orders, purchase orders,

employee payroll), no matter which department (e.g., manufacturing, purchasing sales, accounting) has entered the data into the system.

ERP software suites typically consist of integrated modules of manufacturing, distribution, sales, accounting, and human resource applications. Examples of manufacturing processes supported are material requirements planning, production planning, and capacity planning. Some of the sales and marketing processes supported by ERP are sales analysis, sales planning, and pricing analysis, while typical distribution applications include order management, purchasing, and logistics planning. ERP systems support many vital human resource processes, from personnel requirements planning to salary and benefits administration, and accomplish most required financial record keeping and managerial accounting applications.

BENEFITS AND CHALLENGES OF ERP

ERP systems can generate significant business benefits for a company. Many other companies have found major business value in their use of ERP in several basic ways.

- **Quality and Efficiency.** ERP creates a framework for integrating and improving a company's internal business processes that results in significant improvements in the quality and efficiency of customer service, production, and distribution.
- **Decreased Costs.** Many companies report significant reductions in transaction processing costs and hardware, software, and IT support staff compared with the nonintegrated legacy systems that were replaced by their new ERP systems.
- **Decision Support.** ERP quickly provides vital, cross-functional information on business performance to managers, which significantly improves their ability to make better decisions in a timely manner across the entire business enterprise.
- **Enterprise Agility.** Implementing ERP systems breaks down many former departmental and functional walls or -silos of business processes, information systems, and information resources. This agility results in more flexible organizational structures, managerial responsibilities, and work roles and therefore a more agile and adaptive organization and workforce that can more easily capitalize on new business opportunities.

CAUSES OF ERP FAILURES

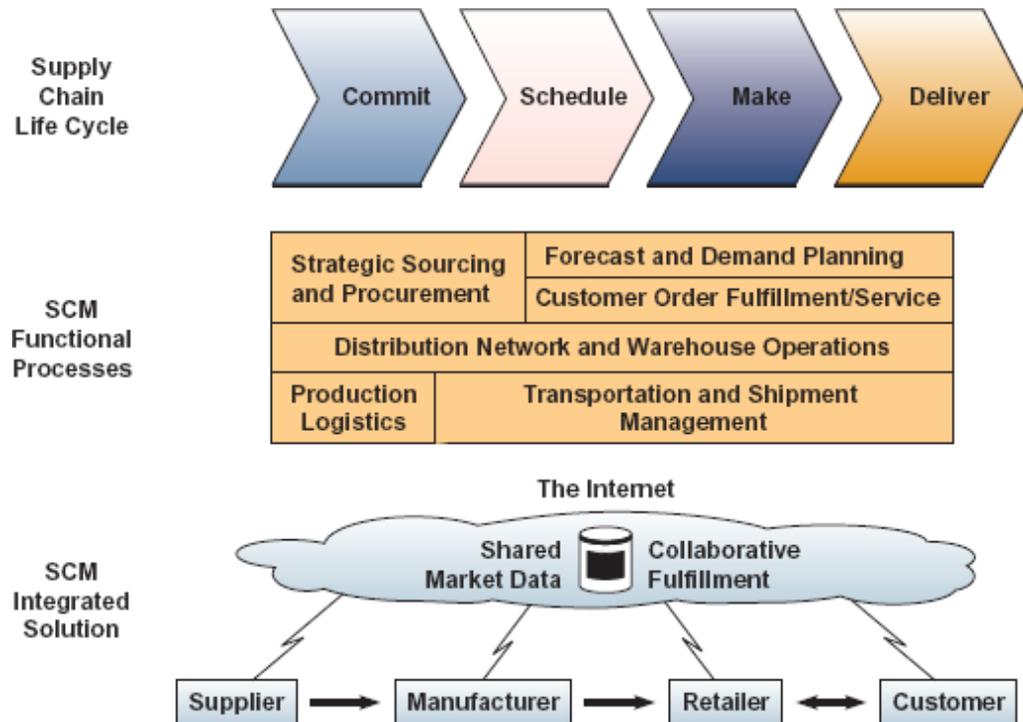
In almost every case, the business managers and IT professionals of these companies underestimated the complexity of the planning, development, and training that were needed to prepare for a new ERP system that would radically change their business processes and information systems. Failure to involve affected employees in the planning and development phases and to change management programs, or trying to do too much too fast in the conversion process, also were typical causes of failed ERP projects. Insufficient training in the new work tasks required by the ERP system and failure to do enough data conversion and testing were other causes of failure. In many cases, ERP failures were also due to overreliance by company or IT management on the claims of ERP software vendors or on the assistance of prestigious consulting firms hired to lead the implementation. The following experience of a company that did it right give us a helpful look at what is needed for a successful ERP implementation.

SUPPLY CHAIN MANAGEMENT;

Supply chain management (SCM) is a cross-functional interenterprise system that uses information technology to help support and manage the links between some of a company's key business processes and those of its suppliers, customers, and business partners.

The goal of SCM is to create a fast, efficient, and low-cost network of business relationships, or supply chain, to get a company's products from concept to market To accomplish this, it must buy raw materials and a variety of contracted services from other companies. The interrelationships with suppliers, Customers, distributors, and other businesses that are needed to design, build, and sell a product make up the network of business entities, relationships, and processes that is called a supply chain.

And because each supply chain process should add value to the products or services a company produces, a supply chain is frequently called a *value chain* In anyevent, many companies today are using Internet technologies to create interenterprise e-business systems for supply chain management that help a company streamline its traditional supply chain processes.



The above diagram illustrates the basic business processes in the supply chain life cycle and the functional SCM processes that support them. It also emphasizes how many companies today are reengineering their supply chain processes, aided by Internet technologies and supplychain management software.

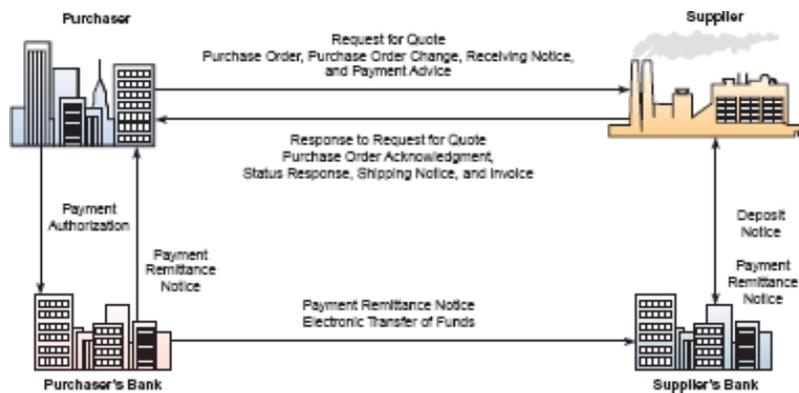
Electronic Data Interchange

Electronic data interchange (EDI) was one of the earliest uses of information technology for supply chain management. EDI involves the electronic exchange of business transaction documents over the Internet and other networks between supply chain trading partners (organizations and their customers and suppliers). Data representing a variety of business transaction documents (e.g., purchase orders, invoices, requests for quotations, shipping notices) are automatically exchanged between computers using standard document message formats. Typically, EDI software is used to convert a company's own document formats into standardized EDI formats specified by various industry and international protocols. Thus, EDI is an example of the almost complete automation of an e-commerce supply chain process. And EDI over the Internet, using secure *virtual private networks*, is a growing B2B e-commerce application.

Formatted transaction data are transmitted over network links directly between computers without paper documents or human intervention. In addition to direct network links

between the computers of trading partners, third-party services are widely used. Value-added network companies like GE Global Exchange Services and Computer Associates offer a variety of EDI services for relatively high fees. But many EDI service providers now offer secure, lower cost EDI services over the Internet.

EDI is still a popular data-transmission format among major trading partners, primarily to automate repetitive transactions, though it is increasingly being replaced by XML-based Web services. EDI automatically tracks inventory changes; triggers orders, invoices, and other documents related to transactions; and schedules and confirms delivery and payment. By digitally integrating the supply chain, EDI streamlines processes, saves time, and increases accuracy. And by using Internet technologies, lower-cost Internet-based EDI services are now available to smaller businesses.



ROLE OF SCM

The below diagram helps us understand the role and activities of supply chain management in business more clearly. The top three levels of diagram show the strategic, tactical, and operational objectives and outcomes of SCM planning, which are then accomplished by the business partners in a supply chain at the execution level of SCM. The role of information technology in SCM is to support these objectives with interenterprise information systems that produce many of the outcomes a business needs to effectively manage its supply chain. That's why many companies today are installing SCM software and developing Web-based SCM information systems.

Until recently, SCM software products typically were developed for either supply chain planning or execution applications. SCM planning software from vendors such as i2 and Manugistics supports a variety of applications for supply and demand forecasting. SCM

SCM Objectives		SCM Outcomes
What? Establish objectives, policies, and operating footprint	Strategic	<ul style="list-style-type: none"> • Objectives • Supply policies (service levels) • Network design
How much? Deploy resources to match supply to demand	Tactical	<ul style="list-style-type: none"> • Demand forecast • Production, procurement, logistics plan • Inventory targets
When? Where? Schedule, monitor, control, and adjust production	Operational	<ul style="list-style-type: none"> • Work center scheduling • Order/inventory tracking
Do Build and transport	Execution	<ul style="list-style-type: none"> • Order cycle • Material movement

execution software from vendors such as EXE Technologies and Manhattan Associates supports applications like order management, logistics management, and warehouse management. However, big ERP vendors like Oracle and SAP are now offering Web-enabled software suites of e-business applications that include SCM modules. Examples include Oracle's e-Business Suite and SAP AG's mySAP.

BENEFITS AND CHALLENGES IN SCM

The promised outcomes that are outlined in the above diagram emphasize the major business benefits that are possible with effective supply chain management systems. Companies know that SCM systems can provide them with key business benefits such as faster, more accurate order processing, reductions in inventory levels, quicker times to market, lower transaction and materials costs, and strategic relationships with their suppliers. All of these benefits of SCM are aimed at helping a company achieve agility and responsiveness in meeting the demands of its customers and the needs of its business partners. However, developing effective SCM systems has proven to be a complex and difficult application of information technology to business operations. So achieving the business value and customer value goals and objectives of supply chain management, has been a major challenge for most companies.

The causes of failures in SCM are a lack of proper demand-planning knowledge, tools, and a guideline is a major source of SCM failure. Inaccurate or overoptimistic demand forecasts will cause major production, inventory, and other business problems, no matter how efficient the rest of the supply chain management process. Inaccurate production, inventory, and other business data provided by a company's other information systems are a frequent cause of SCM problems. And the lack of adequate collaboration among marketing, production, and inventory management departments within a company, and with suppliers, distributors, and others, will sabotage any SCM system. Even the SCM software tools themselves are considered to be

immature, incomplete, and hard to implement by many companies that are installing SCM systems.

DECISION SUPPORT SYSTEMS

Decision Support in Business

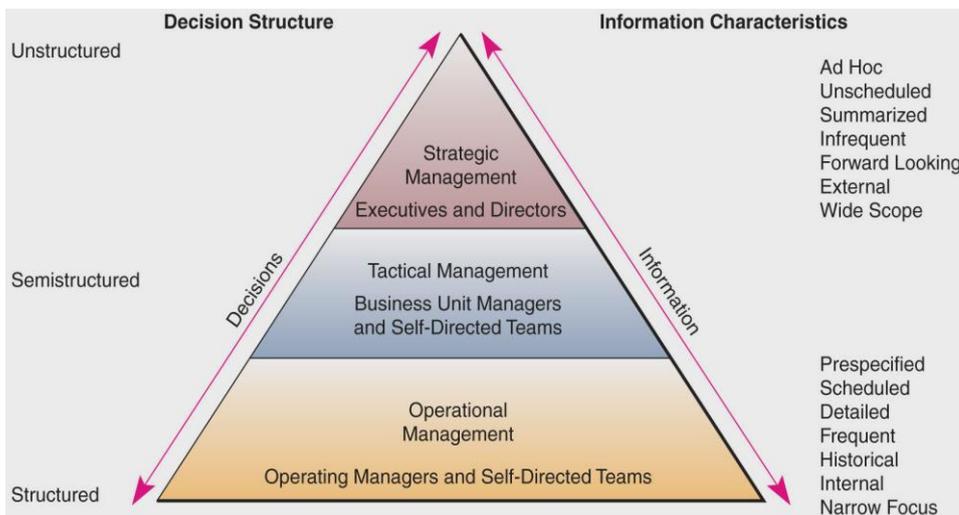
Business and Decision Support:

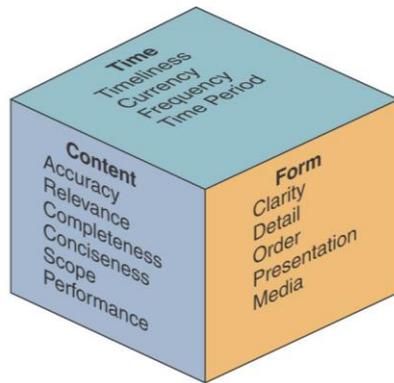
To succeed, companies need information systems that can support the diverse information and decision-making needs of their managers and business professionals.

Information, Decisions, & Management:

The type of information required by decision makers is directly related to the level of management and the amount of structure in the decision situations

Decision Structure	Operational Management	Tactical Management	Strategic Management
Unstructured	Cash management	Business process reengineering	New e-business initiatives
		Workgroup performance analysis	Company reorganization
Semistructured	Credit management	Employee performance appraisal	Product planning
	Production scheduling	Capital budgeting	Mergers and acquisitions
	Daily work assignment	Program budgeting	Site location
Structured	Inventory control	Program control	





Timeliness

- Provided WHEN it is needed
- Up-to-date when it is provided
- Provided as often as needed
- Provided about past, present, and future time periods as necessary

Content

- Free from errors
- Should be related to the information needs of a specific recipient for a specific situation
- Provide all the information that is needed
- Only the information that is needed should be provided
- Can have a broad or narrow scope, or an internal or external focus
- Can reveal performance

Form

- Provided in a form that is easy to understand
- Can be provided in detail or summary form
- Can be arranged in a predetermined sequence
- Can be presented in narrative, numeric, graphic, or other forms
- Can be provided in hard copy, video, or other media.

Decision Support Trends

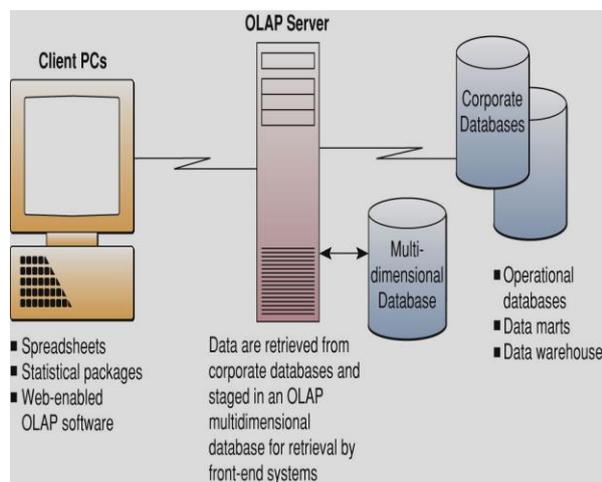
The growth of corporate intranets, extranets and the Web has accelerated the development and use of “executive class” information delivery & decision support software tools to virtually every level of the organization.

Management Information Systems

- The original type of information system
- Produces many of the products that support day-to-day decision-making
- These information products typically take the following forms:
 - ✚ Periodic scheduled reports
 - ✚ Exception reports
 - ✚ Demand reports and responses
 - ✚ Push reports

Online Analytical Processing (OLAP)

- Enables managers and analysts to interactively examine & manipulate large amounts of detailed and consolidated data from many perspectives
 - ✚ Analyze complex relationships to discover patterns, trends, and exception conditions
 - ✚ Real-time
 - Consolidation
 - Drill-down
 - Slicing and Dicing



Decision Support Systems

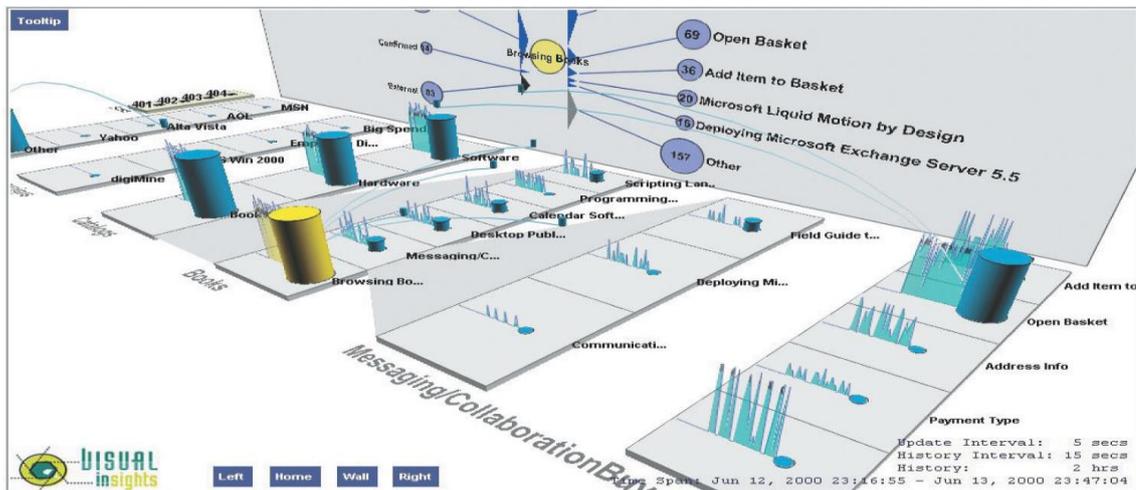
- Provide interactive information support during the decision-making process. They use
 - ◆ Analytical models
 - ◆ Specialized databases
 - ◆ The decision maker's insights & judgments
 - ◆ An interactive, computer-based modeling process to support making semistructured and unstructured business decisions

GIS

- Geographic Information & Data Visualization Systems
 - ◆ Special categories of DSS that integrate computer graphics with other DSS features
 - ◆ GIS
 - A DSS that uses geographic databases to construct and display maps and other graphics displays

Data Visualization

Represent complex data using interactive three-dimensional graphic forms. It helps discover patterns, links, and anomalies.



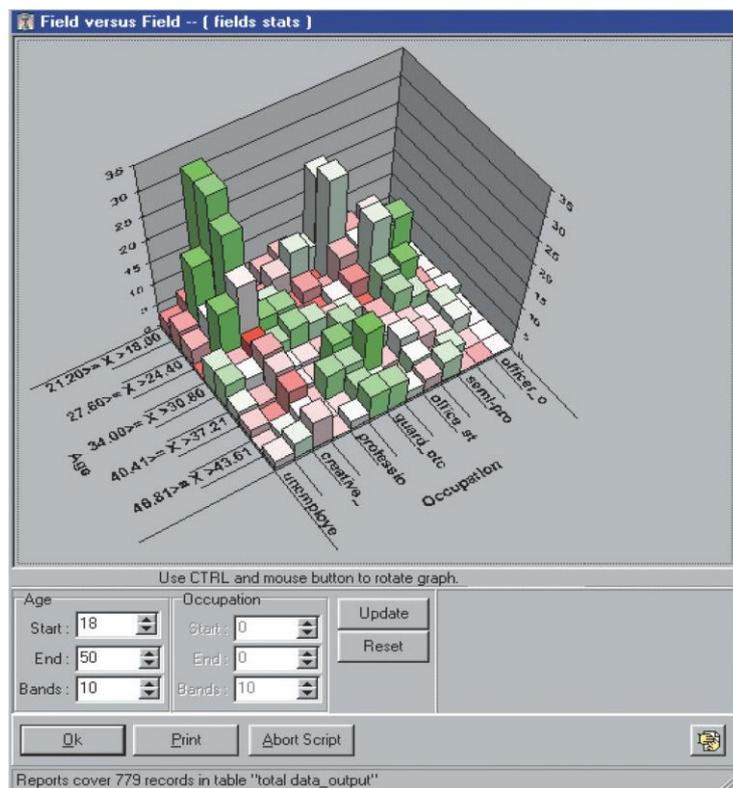
Using Decision Support Systems

- An interactive modeling process
- Four types of analytical modeling
 - ✚ What-if analysis
 - ✚ Sensitivity analysis

- ✚ Goal-seeking analysis
- ✚ Optimization analysis

Data Mining

- Software analyzes vast amounts of data
- Attempts to discover patterns, trends, & correlations
- May perform regression, decision tree, neural network, cluster detection, or market basket analysis



Executive Information Systems (EIS)

- Information presented in forms tailored to the preferences of the users
 - Most stress use of graphical user interface and graphics displays
 - May also include exception reporting and trend analysis
- Alternative names
 - Enterprise information systems

- Executive support systems

Knowledge Management Systems

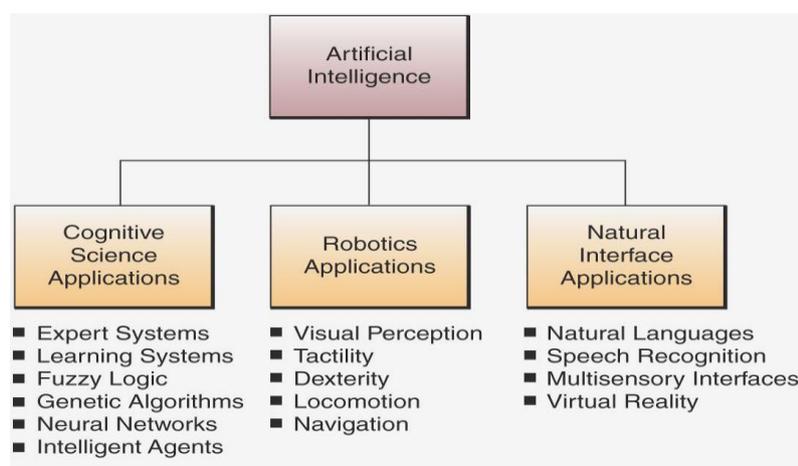
- ✚ IT that helps gather, organize, and share business knowledge within an organization
- ✚ Hypermedia databases that store and disseminate business knowledge. May also be called knowledge bases
- ✚ Best practices, policies, business solutions
- ✚ Entered through the enterprise knowledge portal

ARTIFICIAL INTELLIGENCE TECHNOLOGIES IN BUSINESS

Business and AI:

- ✚ “Designed to leverage the capabilities of humans rather than replace them.
- ✚ AI technology enables an array of applications that forge new connections among people, computers, knowledge, and the physical world.”
- ✚ A field of science and technology based on disciplines such as computer science, biology, psychology, linguistics, mathematics, & engineering
- ✚ Goal is to *develop computers that can think, see, hear, walk, talk, and feel*
- ✚ Major thrust – development of computer functions normally associated with human intelligence – reasoning, learning, problem solving

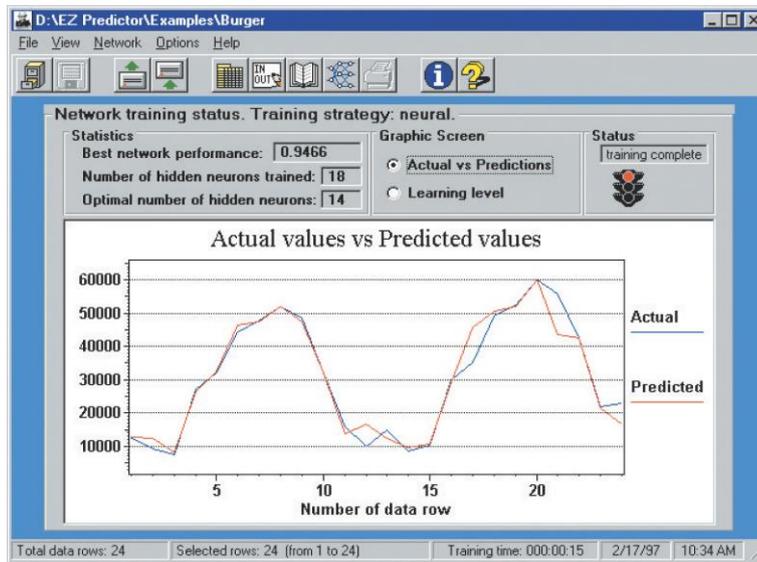
Artificial Intelligence



Neural Networks

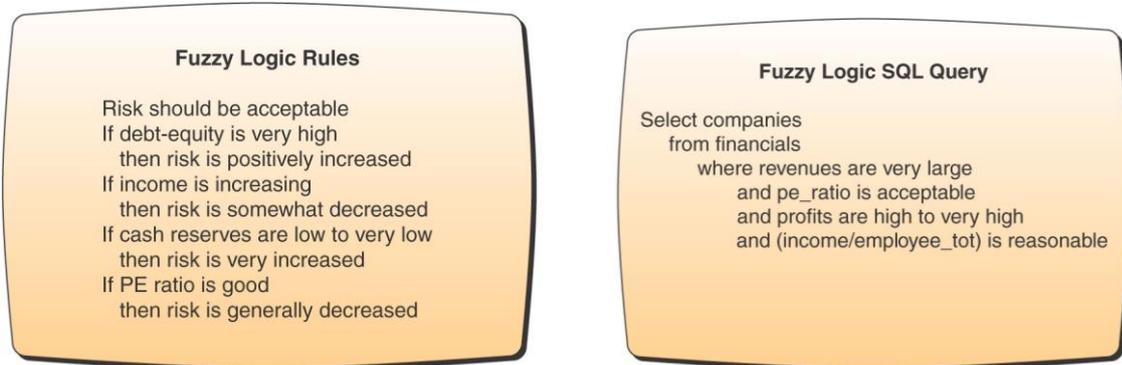
- ✚ Computing systems modeled after the brain’s meshlike network of interconnected processing elements, called neurons

- ✚ Goal – the neural network learns from data it processes



Fuzzy Logic Systems

- ◆ A method of reasoning that resembles human reasoning
- ◆ Allows for approximate values and inferences
- ◆ Allows for incomplete or ambiguous data
- ◆ Allows “fuzzy” systems to process incomplete data and provide approximate, but acceptable, solutions to problems



Genetic Algorithms

- ◆ Uses Darwinian, randomizing, & other mathematical functions to simulate an evolutionary process that can yield increasingly better solutions

- ◆ Especially useful for situations in which thousands of solutions are possible & must be evaluated

Virtual Reality

- ◆ Computer-simulated reality
- ◆ Relies on multisensory input/output devices
- ◆ Allows interaction with computer-simulated objects, entities, and environments in three dimensions
- ◆ CAD

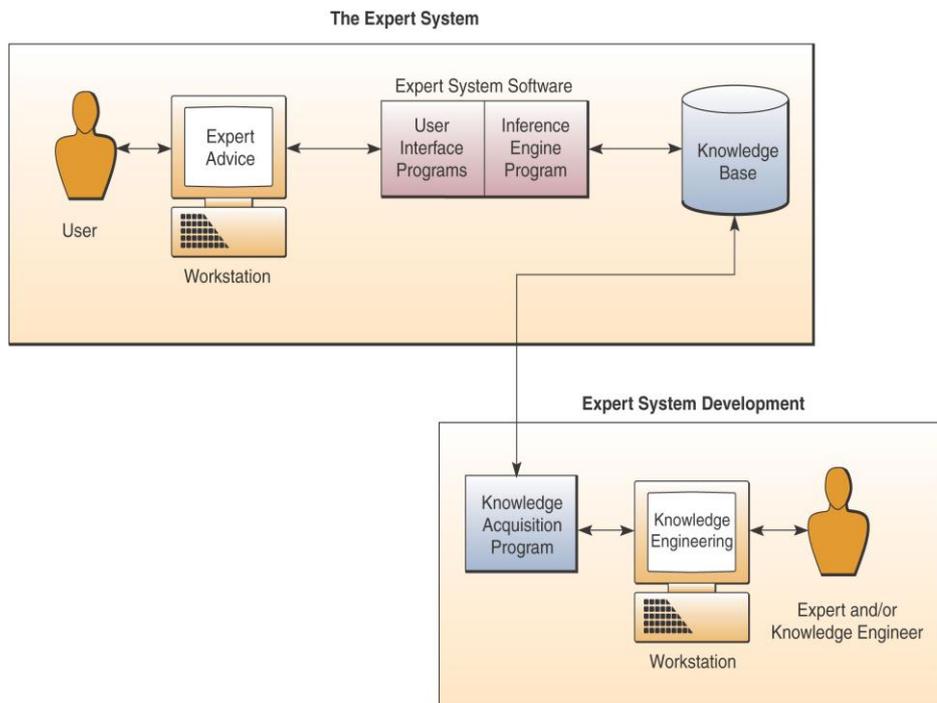
Intelligent Agents

- A “software surrogate” for an end user or a process that fulfills a stated need or activity
- Uses built-in and learned knowledge base about a person or process to make decisions and accomplish tasks



Expert Systems

- A knowledge-based information system that uses its knowledge about a specific, complex application area to act as an expert consultant
- Provides answers to questions in a very specific problem area
- Must be able to explain reasoning process and conclusions to the user



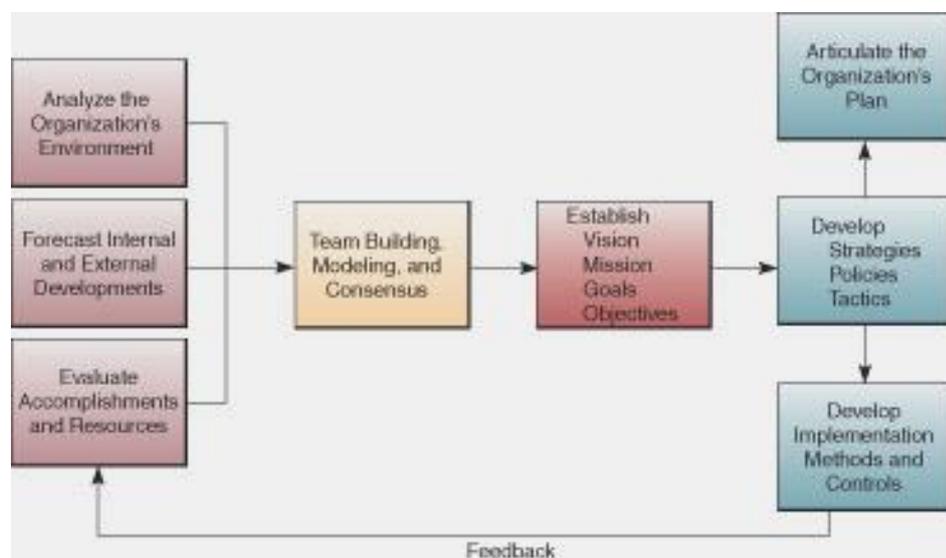
- Components
 - **Knowledge base**
 - Contains
 - ◆ Facts about a specific subject area
 - ◆ Heuristics that express the reasoning procedures of an expert on the subject
 - **Software resources**
 - Contains
 - ◆ an inference engine and other programs for refining knowledge and communicating
 - ◆ Inference engine processes the knowledge, and makes associations and inferences
 - ◆ User interface programs, including an explanation program, allows communication with user

DEVELOPING BUSINESS/IT STRATEGIES

Planning Fundamentals

- Information technology has created a seismic shift in the way companies do business
 - Just knowing the importance and structure of e-business is not enough
 - You must create and implement an action plan that allows you to make the transition from an old business design to a new e-business design

Components of Organizational Planning



Planning for Competitive Advantage

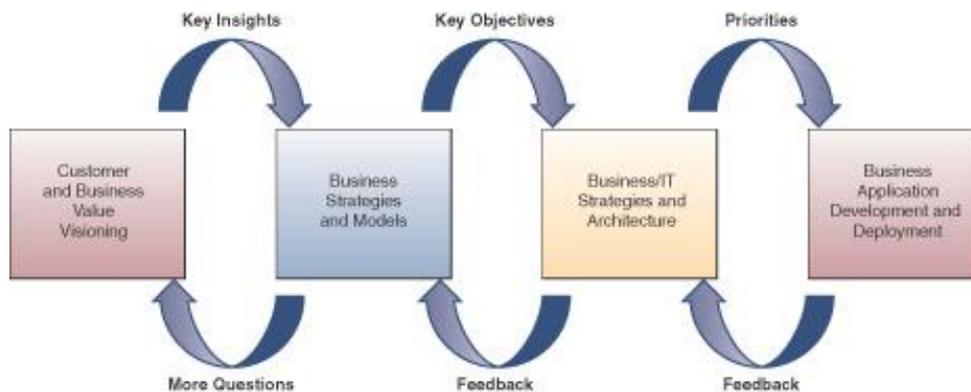
- Strategic business/IT planning
 - Involves evaluating the potential benefits and risks of using IT-based strategies and technologies for competitive advantage
- The following models can help generate ideas for the strategic use of IT to support initiatives
 - Competitive forces
 - Competitive strategies
 - Value chain

Strategic Opportunities Matrix



- SWOT Analysis
 - Strengths:
 - Weaknesses:
 - Opportunities:
 - Threats:

The Business/IT Planning Process



- The business/IT planning process has three major components
 - Strategic development
 - Resource management
 - Technology architecture

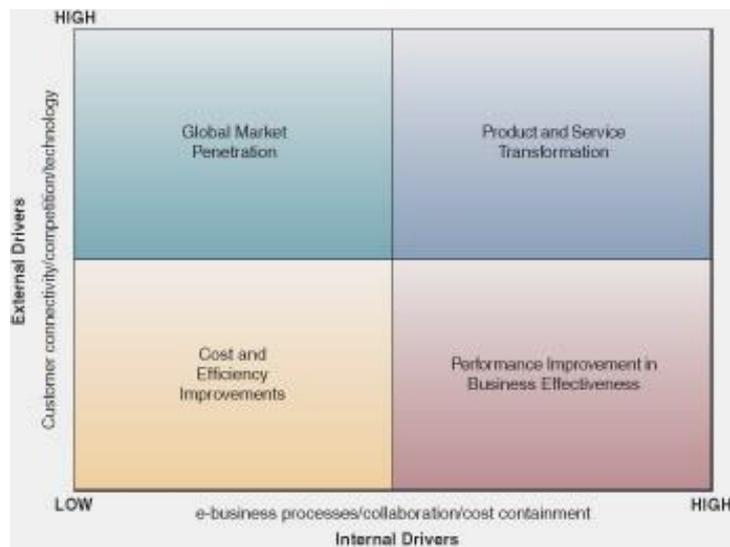
Information Technology Architecture

- The IT architecture is a conceptual design that includes these major components
 - Technology platform
 - Data resources
 - Application architecture
 - IT organization

Identifying Business/IT Strategies

- The most valuable Internet applications allow companies to
 - Transcend communication barriers
 - Establish connections that enhance productivity
 - Stimulate innovative development
 - Improve customer relations

Strategic Positioning Matrix

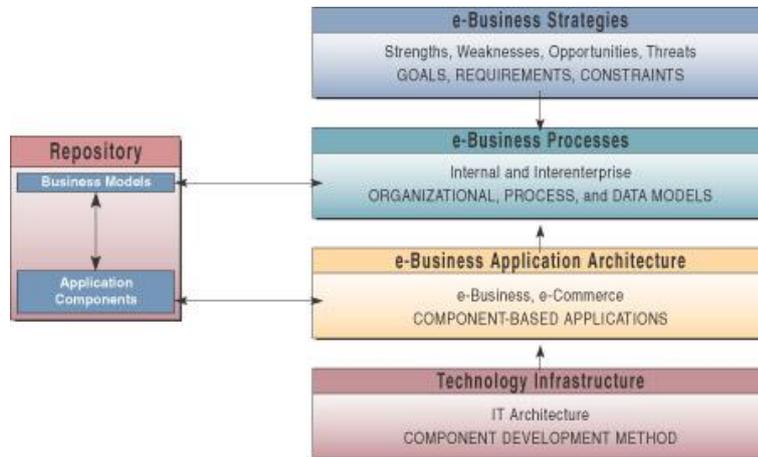


E-Business Strategy Examples

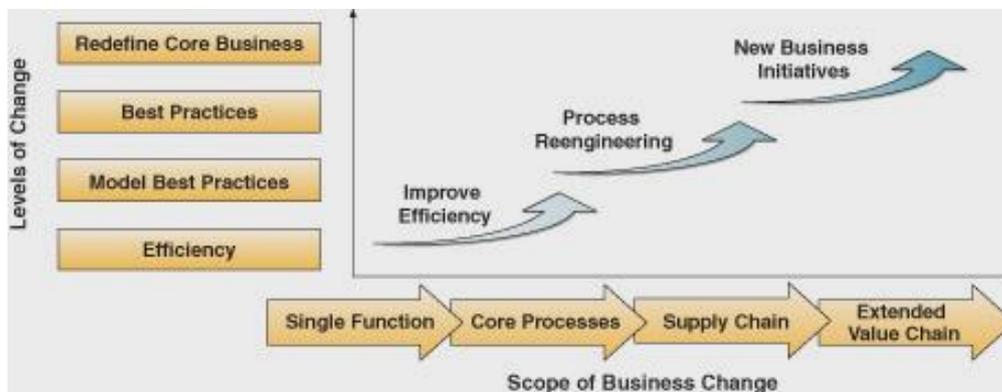
- Market Creator:
- Channel Reconfiguration:
- Transaction Intermediary:
- Infomediary:
- Self-Service Innovator:

- Supply Chain Innovator:
- Channel Mastery:

E-Business Architecture Planning



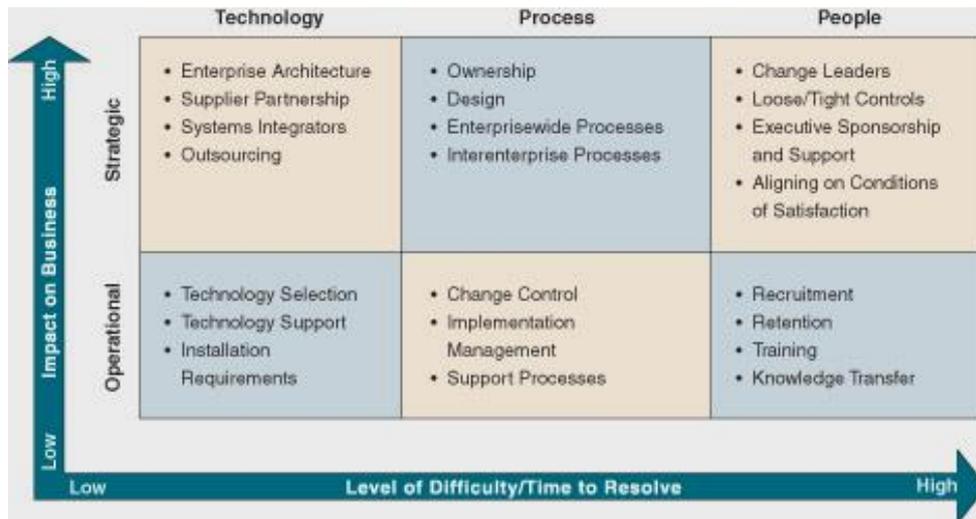
Impact and Scope of Implementing IT



Change Management

People factors have the highest level of difficulty and the longest time to resolve of any dimension of change management

Key Dimensions of Change Management



- Implem

enting a new e-business application may involve

- Developing an action plan
- Assigning managers as change sponsors
- Developing employee change teams
- Encouraging open communications and feedback about organizational changes

A Change Management Process



DEVELOPING BUSINESS/IT SOLUTIONS

Developing e-Business Systems

- **Information Systems Development**

The systems approach to problem solving applied to the development of information system solutions to business problems.

- **The Systems Approach**

- The systems approach to problem solving

- Recognize and define a problem or opportunity using systems thinking
- Develop and evaluate alternative system solutions
- Select the system solution that best meets your requirements
- Design the selected system solution
- Implement and evaluate the success of the designed system

- **System Thinking**

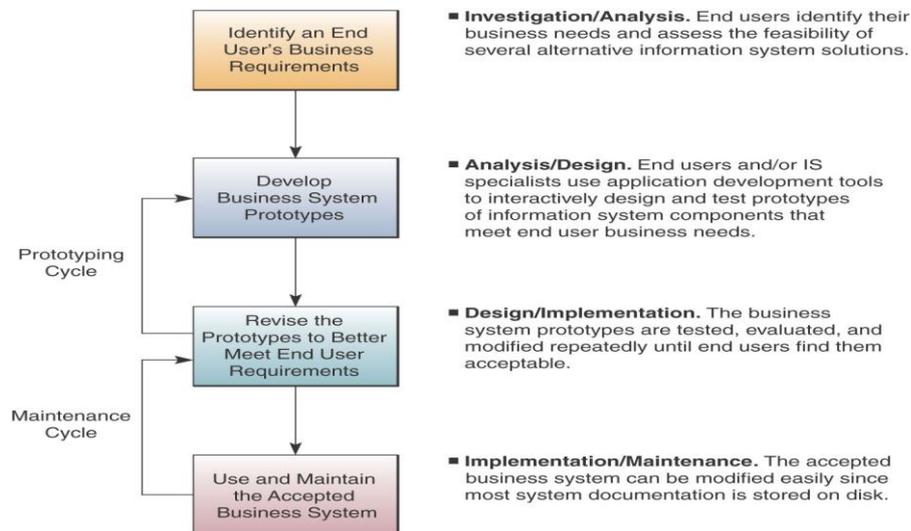
- “seeing the forest AND the trees”
- Seeing “interrelationships” among “systems” rather than linear cause-and-effect chains when events occur
- Seeing “processes” of change among “systems” rather than discrete “snapshots” of change, whenever change occurs.
- Use a systems context
 - Try to find systems, subsystems, and components of systems in any situation you are studying

The Systems Development Cycle

- Investigation
- Analysis
- Design
- Implementation
- Maintenance

Prototyping

- The rapid development and testing of working models of new applications in an interactive, iterative process.
- Sometimes called rapid application design (RAD).
- Simplifies and accelerates systems design.



Starting the Systems Development Process

- Systems Investigation Phase
 - ❖ Feasibility studies
 - Organizational feasibility
 - Economic feasibility
 - Technical feasibility
 - Operational feasibility

Organizational Feasibility	Economic Feasibility
<ul style="list-style-type: none"> • How well the proposed system supports the business priorities of the organization 	<ul style="list-style-type: none"> • Cost savings • Increased revenue • Decreased investment requirements • Increased profits
Technical Feasibility	Operational Feasibility
<ul style="list-style-type: none"> • Hardware, software, and network capability, reliability and availability 	<ul style="list-style-type: none"> • Employee, customer, supplier acceptance • Management support • Government or other requirements

Tangible Benefits	Example
<ul style="list-style-type: none"> • Increase in sales or profits • Decrease in information processing costs • Decrease in operating costs • Decrease in required investment • Increased operational efficiency 	<ul style="list-style-type: none"> • Development of IT-based products • Elimination of unnecessary documents • Reduction in inventory carrying costs • Decrease in inventory investment required • Less spoilage, waste, and idle time
Intangible Benefits	Example
<ul style="list-style-type: none"> • Improved information availability • Improved abilities in analysis • Improved customer service • Improved employee morale • Improved management decision making • Improved competitive position • Improved business image 	<ul style="list-style-type: none"> • More timely and accurate information • OLAP and data mining • More timely service response • Elimination of burdensome job tasks • Better information and decision analysis • Systems that lock in customers • Progressive image as perceived by customers, suppliers, and investors

Systems Analysis

- ❖ Systems analysis is an in-depth study of end user information needs that produces functional requirements.
- ❖ Traditionally involves a detailed study of...
 - Information needs of the company & end users
 - Activities, resources, & products of one or more of the present information systems
 - The IS capabilities required to meet information needs of the company, the end users, and all business stakeholders that may use the system

Organizational analysis:

- ✚ Study
 - Management structure
 - The people
 - Business activities
 - Environmental systems
 - The current information system

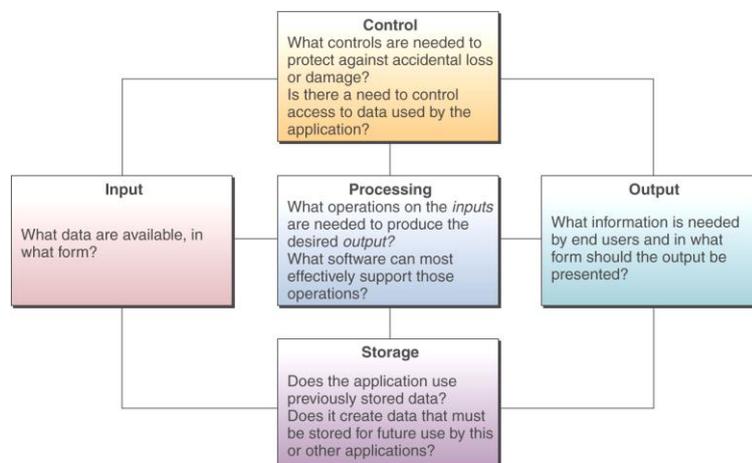
Systems Design

- Specifies HOW the system will meet the information needs of users
- Focuses on three major products
 - ❖ User interface design

- ❖ Data design
 - Database structures
- ❖ Process design
 - Processing and control procedures
- User interface design
 - ❖ Focuses on supporting the interactions between end users and the computer-based applications
 - Display screens
 - Interactive user/computer dialogues
 - Audio responses
 - Forms, documents, and reports
- System specifications
 - ❖ Formalizes the design of the application's user interface methods & products
 - ❖ Formalizes database structures
 - ❖ Formalizes processing and control procedures

End User Development

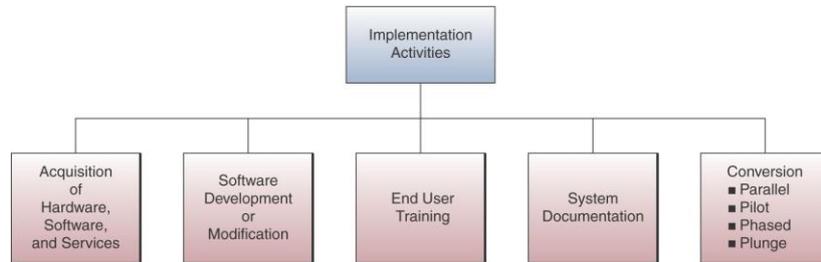
- IS professionals play a consulting role
 - Training in the use of application packages
 - Assistance with the selection of hardware and software
 - Assistance in gaining access to organization databases
 - Assistance in the analysis, design, and implementation of your application



Implementing e-Business Systems

- This is the actual deployment of the information technology system.
- Follows the investigation, analysis, and design stages of the systems development cycle.

Implementing New Systems



Evaluating Hardware, Software, & Services

- ❖ May require suppliers to present bids and proposals based on system specifications
 - Minimum acceptable physical & performance characteristics for all hardware and software requirements are established
 - Large businesses and government agencies formalize requirements by listing them in a Request for Proposal (RFP) or a Request for Quotation (RFQ)
- ❖ May use a scoring system for evaluation
 - Determine evaluation factors and assign points
- ❖ Performance of hardware and software must be demonstrated and evaluated
 - May use benchmark test programs

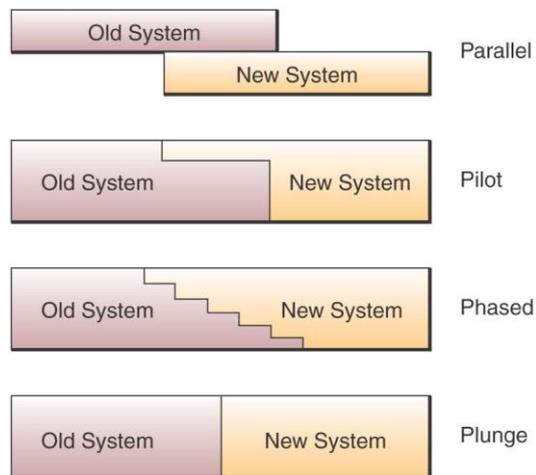
Hardware evaluation factors

- Performance
 - Speed, capacity, throughput
- Cost
 - Lease or purchase price
 - Cost of operations and maintenance
- Reliability
 - Risk of malfunction & maintenance requirements
 - Error control and diagnostic features
- Compatibility
 - With existing hardware and software?
 - With hardware & software provided by competing suppliers?
- Connectivity

- Easily connected to WANs and LANs that use different types of network technologies and bandwidth alternatives?
- Scalability
 - Can it handle the processing demands of end users, transactions, queries, & other processing requirements?
- ❖ Software evaluation factors
 - Quality
 - Bug free?
 - Efficiency
 - Well-developed system of program code that does not use much CPU time, memory capacity, or disk space?
 - Flexibility
 - Can it handle our processes easily without major modification?
 - Security
 - Does it provide control procedures for errors, malfunctions, and improper use?
 - Connectivity
 - Web-enabled?
 - Language
 - Is the programming language familiar to internal software developers?
 - Documentation
 - Well-documented? Help screens and helpful software agents?
 - Hardware
 - Does existing hardware have the features required to best use this software?
- ❖ Evaluating IS Services
 - Performance
 - Past performance in view of past promises
 - Systems development
 - Are website and other e-business developers available? Quality and cost
 - Maintenance
 - Is equipment maintenance provided? Quality and cost

- Conversion
 - What systems development & installation services will they provide during the conversion period?
- Accessibility
 - Services from local or regional sites?
 - Customer support center?
 - Customer hot line?
- Business position
 - Financially strong with good industry market prospects?

Other Implementation Activities:



Security and Ethical Challenges

Security, Ethical, and Societal Challenges

- The use of IT presents major security challenges, poses serious ethical questions, and affects society in significant ways.
- IT raises ethical issues in the areas of..
 - ❖ Crime
 - ❖ Privacy
 - ❖ Individuality
 - ❖ Employment
 - ❖ Health
 - ❖ Working conditions
- But, IT has had beneficial results as well.
- So as managers, it is our responsibility to minimize the detrimental effects and optimize the beneficial effects.
- Business Ethics
 - ❖ Basic categories of ethical issues
 - Employee privacy
 - Security of company records
 - Workplace safety
- Theories of corporate social responsibility
 - ❖ Stockholder theory
 - Managers are agents of the stockholders. Their only ethical responsibility is to increase profit without violating the law or engaging in fraud
 - ❖ Social Contract Theory
 - Companies have ethical responsibilities to all members of society, which allow corporations to exist based on a social contract
 - ❖ First condition – companies must enhance economic satisfaction of consumers and employees

- ❖ Second condition – avoid fraudulent practices, show respect for employees as human beings, and avoid practices that systematically worsen the position of any group in society

- Technology Ethics

- Four Principles

- Proportionality

- ❖ Good must outweigh any harm or risk
 - ❖ Must be no alternative that achieves the same or comparable benefits with less harm or risk

- Informed consent

- ❖ Those affected should understand and accept the risks

- Justice

- ❖ Benefits and burdens should be distributed fairly

- Minimized Risk

- ❖ Even if judged acceptable by the other three guidelines, the technology must be implemented so as to avoid all unnecessary risk

- Ethical guidelines

- Responsible end users

- Act with integrity
 - Increase their professional competence
 - Set high standards of personal performance
 - Accept responsibility for their work
 - Advance the health, privacy, and general welfare of the public

Computer Crime

- Association of Information Technology Professionals (AITP) definition includes

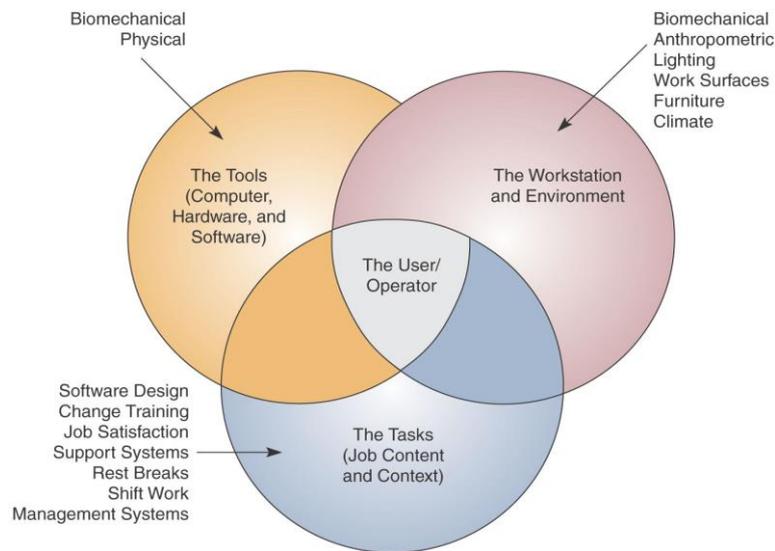
- The unauthorized use, access, modification, and destruction of hardware, software, data, or network resources
- Unauthorized release of information
- Unauthorized copying of software
- Denying an end user his/her own hardware, software, data, or network resources
- Using or conspiring to use computer or network resources to illegally obtain info or tangible property
- Hacking
 - The obsessive use of computers, or the unauthorized access and use of networked computer systems
- Cyber Theft
 - Involves unauthorized network entry and the fraudulent alteration of computer databases
- Unauthorized use at work
 - Also called time and resource theft
 - May range from doing private consulting or personal finances, to playing video games, to unauthorized use of the Internet on company networks
- Software Piracy
 - Unauthorized copying of software
 - Software is intellectual property protected by copyright law and user licensing agreements
- Piracy of intellectual property
 - Other forms of intellectual property covered by copyright laws
 - Music
 - Videos
 - Images
 - Articles
 - Books

Health Issues

- Job stress

- Muscle damage
- Eye strain
- Radiation exposure
- Accidents
- Some solutions
 - Ergonomics (human factors engineering)

Goal is to design healthy work environments



Security Management

- Goal
 - Minimize errors, fraud, and losses in the e-business systems that interconnect businesses with their customers, suppliers, and other stakeholders
- Encryption
 - Passwords, messages, files, and other data is transmitted in scrambled form and unscrambled for authorized users
 - Involves using special mathematical algorithms to transform digital data in scrambled code
 - Most widely used method uses a pair of public and private keys unique to each individual
- Firewalls
 - Serves as a “gatekeeper” system that protects a company’s intranets and other computer networks from intrusion

- Provides a filter and safe transfer point
- Screens all network traffic for proper passwords or other security codes
- E-mail Monitoring
 - “Spot checks just aren’t good enough anymore. The tide is turning toward systematic monitoring of corporate e-mail traffic using content-monitoring software that scans for troublesome words that might compromise corporate security.”
- Virus Defenses
 - Protection may accomplished through
 - Centralized distribution and updating of antivirus software
 - Outsourcing the virus protection responsibility to ISPs or to telecommunications or security management companies
- Biometric Security
 - Measure physical traits that make each individual unique
 - Voice
 - Fingerprints
 - Hand geometry
 - Signature dynamics
 - Keystroke analysis
 - Retina scanning
 - Face recognition and Genetic pattern analysis

ENTERPRISE AND GLOBAL MANAGEMENT OF INFORMATION TECHNOLOGY

Managing Information Technology

Business and IT:

As companies are transformed into global e-businesses and players in global e-commerce, it is vital for business managers and professionals to understand how to manage this vital function.

The Impact of IT on Managers:

- A major force for precipitating or enabling organizational and managerial change
- Enables innovative changes in managerial decision making, organizational structures, and managerial work activities

The Impact of IT on Organizations:

- Key dimensions of the networked enterprise
 - Organizational structure
 - Leadership and governance
 - People and culture
 - Coherence
 - Knowledge
 - Alliances

Managing Information Technology:

- Three major components
 - Managing the joint development and implementation of e-business and IT strategies
 - Managing the development of e-business applications and the research & implementation of new IT
 - Managing the IT processes, professionals, & subunits with the IT organization & IS function

Managing the IS Function:

- Organizing IT
 - Centralization
 - Decentralization

- Latest trend, hybrid
- **Managing Application Development:**
 - Involves managing activities such as
 - systems analysis and design
 - prototyping
 - applications programming
 - project management
 - quality assurance
 - systems maintenance
- **Managing IS Operations**
 - Managing the use of hardware, software, network, and personnel resources in data centers/computer centers within an organization
 - System Performance Monitors
 - Monitor processing of computer jobs
 - Helps develop a planned schedule
 - Produce detailed stats for planning and control of computing capacity
 - Chargeback systems
 - Process control
- **Human Resource Management of IT**
 - Recruit qualified personnel
 - Develop, organize, and direct the capabilities of existing personnel
 - Train employees
 - Design career paths and set salary and wage levels

Failures in IT Management

- IT is not being used effectively by companies that use IT primarily to computerize traditional business processes, instead of using it for innovative e-business processes
- IT is not being used efficiently by IS that provide poor response times and frequent down times or when application development projects are not managed properly

- Management Involvement and Governance
 - Senior management needs to be involved in critical business/IT decisions to optimize the business value and performance of the IT function.
 - Requires development of governance structures that encourage active participation in planning and controlling the business uses of IT.

MANAGING GLOBAL IT

The International Dimension:

- A vital part of managing an e-business enterprise in the internetworked global economies and markets of today.

Cultural, Political, and Geo-economic Challenges:

- Cultural challenges
 - Differences in languages
 - Cultural interests
 - Religions
 - Customs
 - Social attitudes
 - Political philosophies
- **Political challenges**
 - Rules regulating or prohibiting transfer of data across their national boundaries
 - Severe restrictions, taxes, or prohibitions against imports of hardware and software
 - Local content laws
 - Reciprocal trade agreements

Global e-Business Strategies:

- Moving away from
 - Autonomous foreign subsidiaries
 - Autonomous foreign subsidiaries, dependent on headquarters for new processes, products, and ideas

- Close management of worldwide operations by headquarters

Global e-Business Applications:

- IT applications depend on a variety of global business drivers, caused by the nature of the industry and its competitive or environmental forces
 - Global customers
 - Global products
 - Global operations
 - Global resources
 - Global collaboration