Chapter 1

Why study IS and IT ?

- **Vital component of successful businesses**
- **Helps businesses expand and compete**
- **Businesses use IS and IT**

– To improve efficiency and effectiveness of business processes

– For managerial decision making

– For workgroup collaboration

What is a system and Information System (IS)?

- **System : is interrelated components working together to achieve functionalities or objectives**
- **Information System: is all components and resources necessary to deliver information and function to organization.**

IS :

•An organized combination of
–People
–Hardware
–Software
–Communications networks
–Data resources
–Policies and procedures
•That stores, retrieves, transforms, and disseminates information in an organization

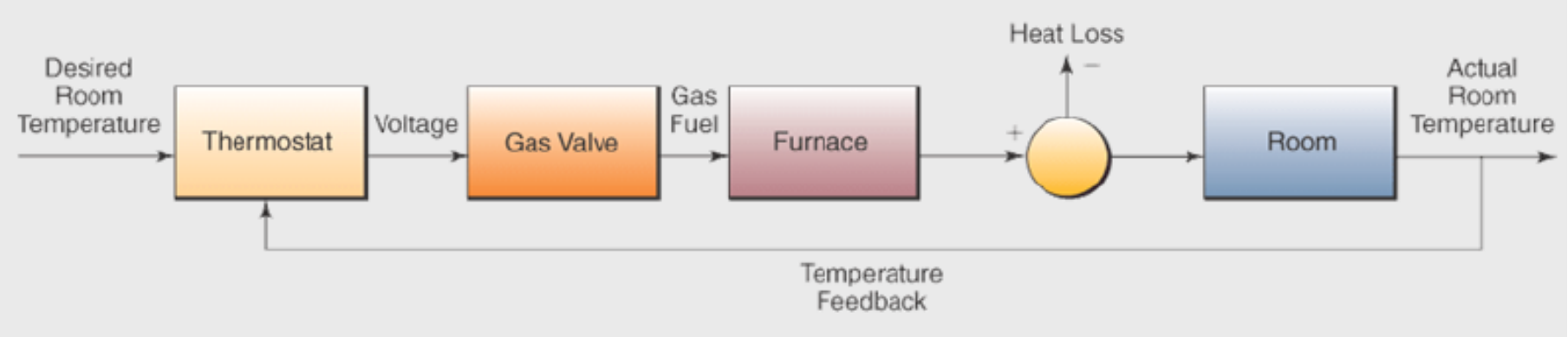
Systems have three basic functions:

- **Input involves capturing and assembling elements that enter the system to be processed**
- **Processing involves transformation process that convert input into output**
- **Output involves transferring elements that have been produced by the transformation process to their ultimate destination**

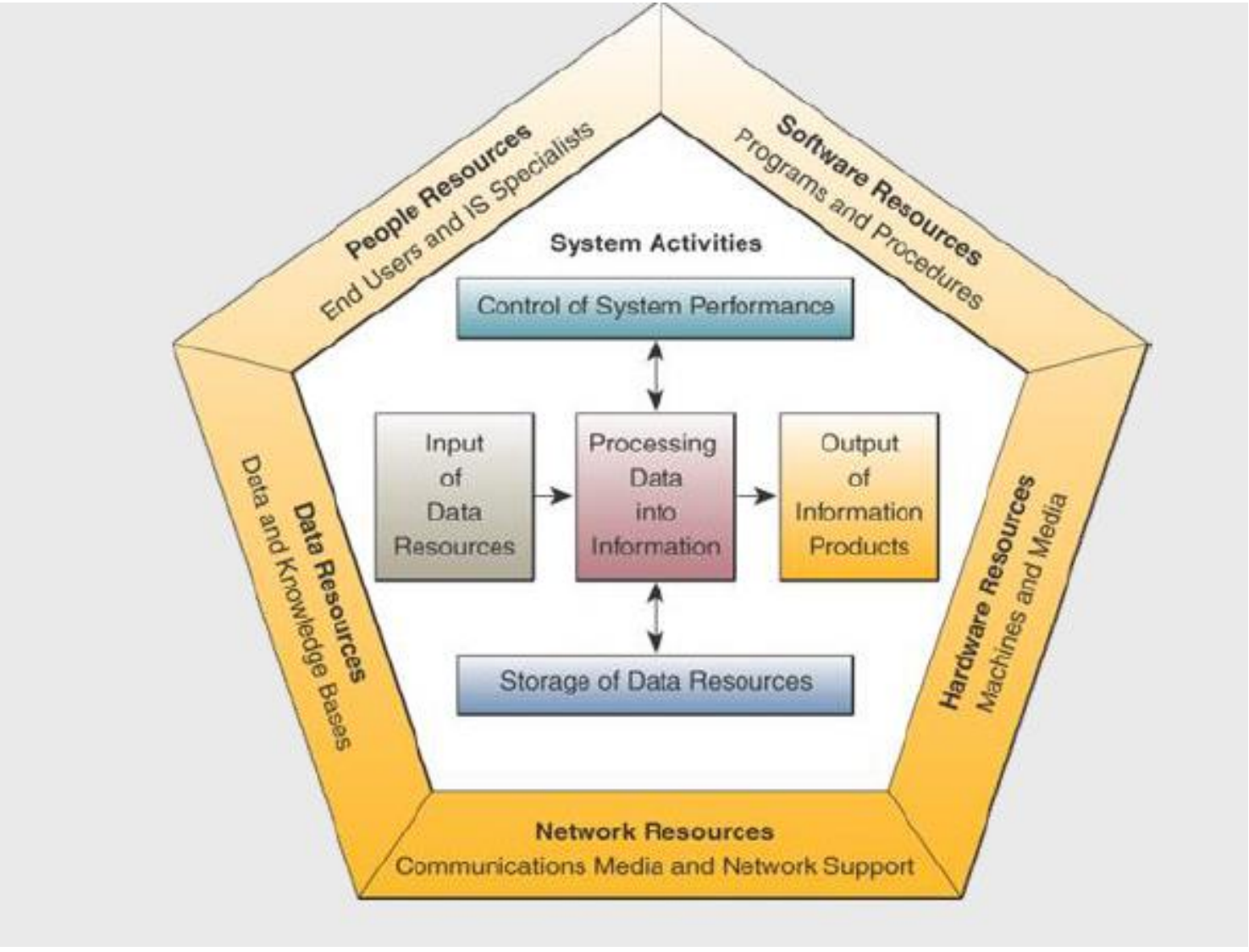
Cybernetic system :

- **All systems have input, processing and output**
- **A cybernetic system, a self-monitoring, self-regulating system, adds feedback and control:**
  - **Feedback: is data about the performance of a system**
  - **Control: involves monitoring and evaluating feedback to determine whether a system is moving towards the achievement of its goal**

A Cybernetic system



Information systems model



Components of an IS

- **People Resources**
  - –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

Data versus Information

•**Data** are raw facts about physical phenomena or business transactions
•**Information** is data that has been converted into meaningful and useful context for end users
•**Example:**
–Sales data is names, quantities and dollar amounts
–Sales information is amount of sales by product type, sales territory or salesperson

IS Activities :

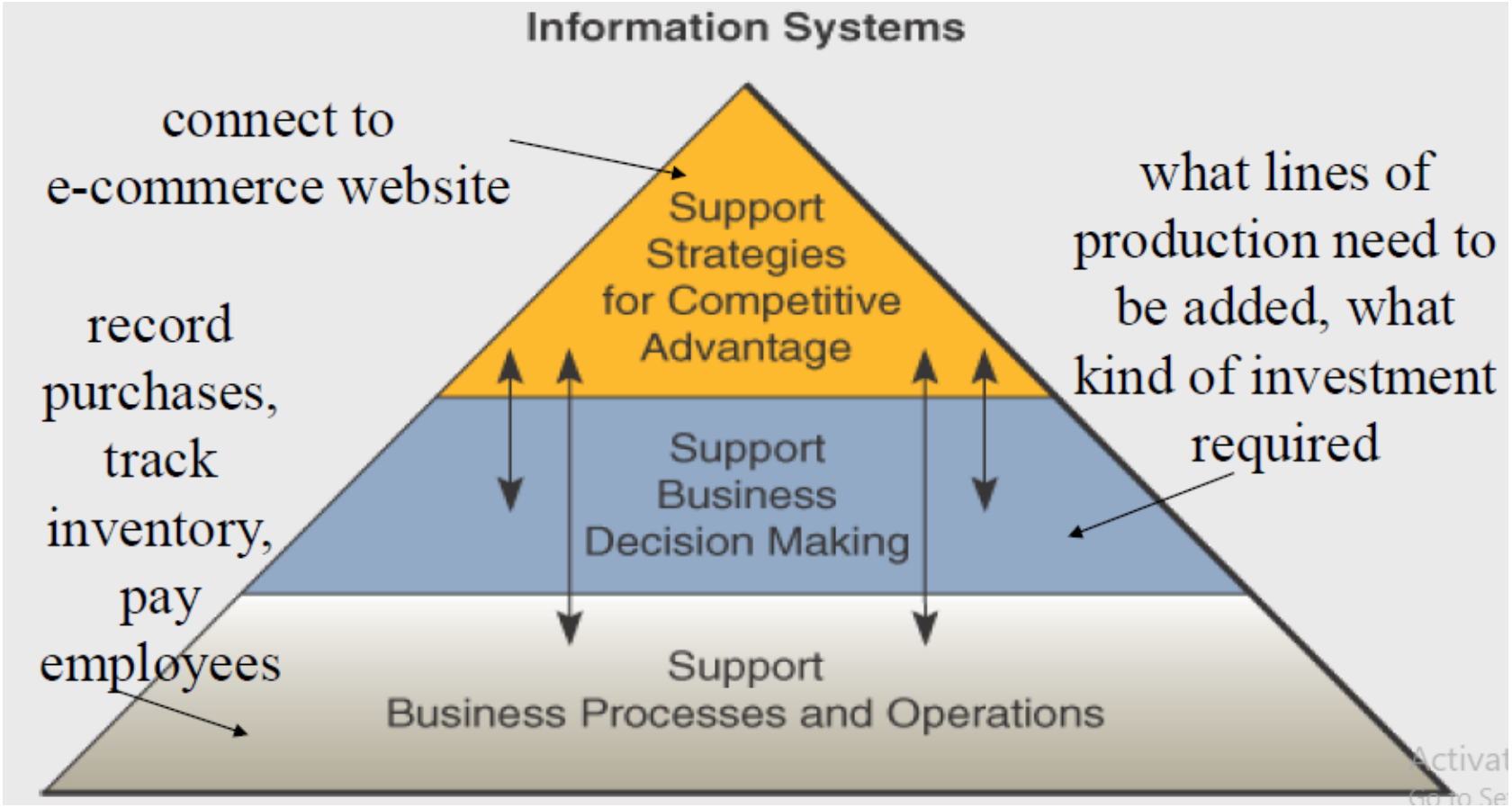
•Input of data resources
–Data entry activities
•Processing of data into information
–E.g., calculate, compare, sort, classify, summarize
•Output of information products
–Messages, reports, forms and graphic images
•Storage of data resources
–Data elements and databases
•Control of system performance
–Monitoring and evaluating feedback

Information System (IS) versus Information Technology (IT)

- **IS is all the components and resources necessary to deliver information and functions to the organization**
- **IT is hardware, software, networking and data management**
- **In theory, IS could be paper based .**
- **But we will focus on Computer-Based Information Systems (CBIS)**

Fundamental Roles of IS in Business

- **Support of business processes and operations.**
- **Support of decision making by employees and managers.**
- **Support of strategies for competitive advantage.**



Trends in Information Systems

E-Business

•while IS has expanded, they are still doing the same basic things that they've been doing.

•What has changed is:

1. more integration of functions,

2. greater connectivity across components,

3. better use for maximum advantage of business and strategic opportunities

E-business:

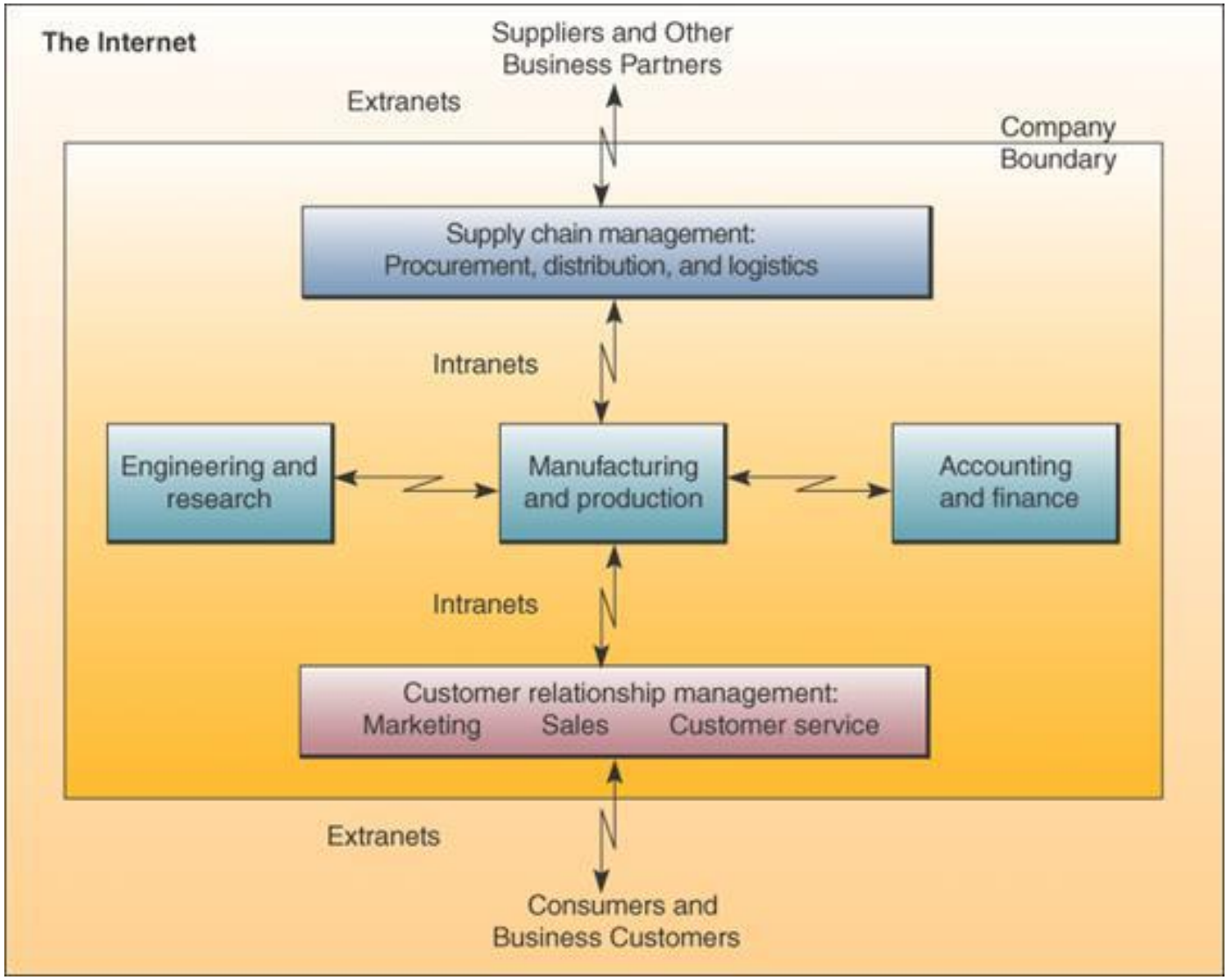
•The use of Internet technologies

–to work and empower business processes, electronic commerce, and enterprise collaboration

–within a company and with its customers, suppliers, and other business stakeholders.

•An online exchange of value.

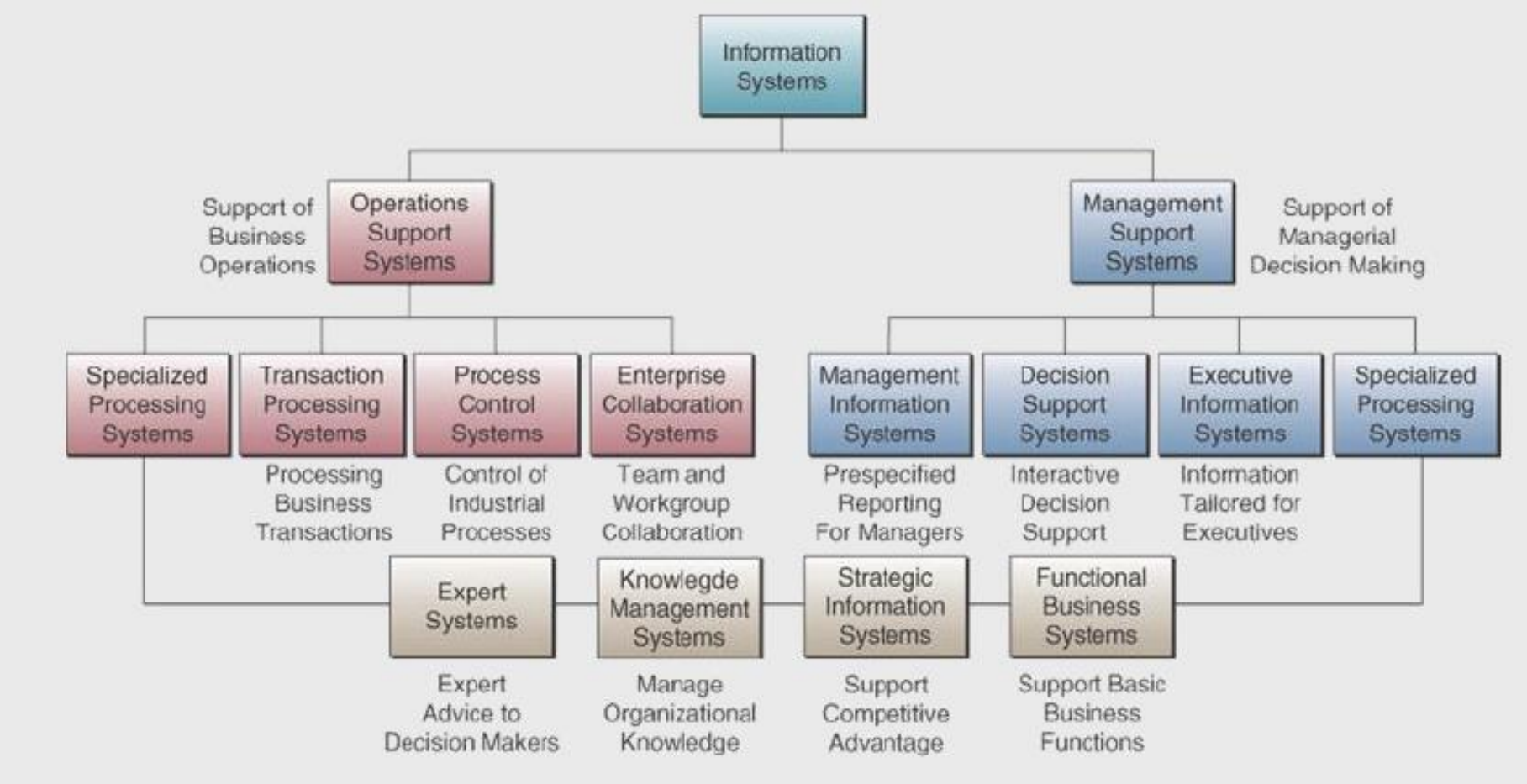
How E-business have being used?



E-business Use

- Reengineer internal business processes
- **Enterprise collaboration systems:** support communications, coordination and collaboration among teams and work groups, e.g., virtual teams
- **Electronic commerce:** buying, selling, marketing and servicing of products and services over computer networks

Types of IS


Information Systems
Support of Business Operations
Operations Support Systems
Management Support Systems
Support of Managerial Decision Making
Specialized Processing Systems
Transaction Processing Systems
Process Control Systems
Enterprise Collaboration Systems
Management Information Systems
Decision Support Systems
Executive Information Systems
Specialized Processing Systems
Processing Business Transactions
Control of Industrial Processes
Team and Workgroup Collaboration
Prespecified Reporting For Managers
Interactive Decision Support
Information Tailored for Executives
Expert Systems
Knowlegde Management Systems
Strategic Information Systems
Functional Business Systems
Expert Advice to Decision Makers
Manage Organizational Knowledge
Support Competitive Advantage
Support Basic Business Functions

Operations support systems

–Efficiently process business transactions
–Control industrial processes
–Support communications and collaboration
–Update corporate databases

Types of Operations Support Systems

•Transaction Processing Systems
–Record and process data from business transactions
–Examples: sales processing, inventory systems, accounting systems
•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

–Provide information and support for effective decision making by managers

Types of Management Support Systems

•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 dollars
•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

Classifications of IS by scope

- **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

Challenges and Opportunities of IT

Business / IT Challenges

- Speed and flexibility requirements of product development, manufacturing, and delivery cycles.
- Reengineering and cross-functional integration of business processes using Internet technologies.
- Integration of e-business and e-commerce into the organization's strategies, processes, structure, and culture.

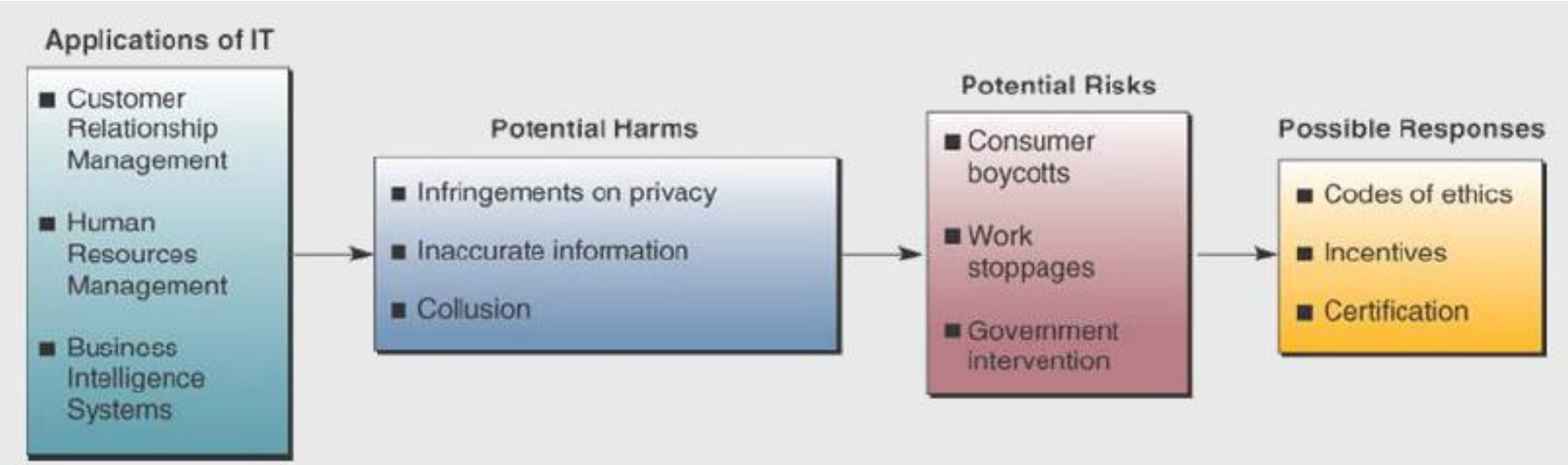
Business / IT Developments

- Use of the Internet, intranets, extranets, and the Web as the primary IT infrastructure.
- Diffusion of Web technology to internetwork employees, customers, and suppliers.
- Global networked computing, collaboration, and decision support systems.

Business / IT Goals

- Give customers what they want, when and how they want it, at the lowest cost.
- Coordination of manufacturing and business processes with suppliers and customers.
- Marketing channel partnerships with suppliers and distributors.

Ethical challenges of IT applications



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?

Measuring success of an IS

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
•What's the difference between Efficiency and Effectiveness?

Case 2: Autosystems: The Business Value of a Successful IT System for a small Manufacturer

•Autosystems is an automotive lighting designer and manufacturer located in Belleville, Ontario.
•A few years ago it installed the ActivEntry shop floor reporting system to move shop floor information into the manufacturing planning and control system.
•They now have the ability to capture labor, efficiency, production, scrap, etc., on time and by work center, for every cell, and are able to talk about that every day in their team meetings.
•Production managers can review information from all three plants.

Case Study Questions

- Why did Autosystems decide to install the ActivEntry system? Why did the company feel it was necessary to integrate it with its TRANS4M system?
- Which three business benefits, of the many that resulted from the use of ActivEntry, gave the company the most business value? Defend your choices.
- What changes are already being planned to improve the use of ActivEntry? What other improvements should the company consider? Why?

Real world activities

1.Go to the Infor Global Solutions Web site, www.infor.com, to find other stories that describe the business value of manufacturing planning and control systems.
–Discover any common reasons for the success of these companies with their systems?
–Present your findings to the class.
2.Search the Internet for examples of problems that companies have had with manufacturing systems.
–Discuss your findings and what solutions you can propose to help companies avoid the problems you discovered.

Real World Group Activity

1.Search the Internet for examples of problems that companies have had with manufacturing systems.
–Discuss your findings and what solutions you can propose to help companies avoid the problems you discovered.

Case 3: Heidelberg, Honeywell and Eaton: Using IT to Build Smart Products and Services

- Today it will not be enough for a companies to offer valuable services for their products but they will have to provide “smart services.”
- To provide smart services, companies must use information technology to build “smart products,” products with awareness and connectivity into the products themselves.
- Typically, smart products can detect that a part is approaching failure and alert users, thus giving the company opportunity to provide maintenance services and enjoy the resulting benefits.

Case Study Questions

1.Why should manufacturing companies build smart products and provide smart services? What business benefits can they gain? Provide several examples beyond those discussed in this case.
2.What information technologies are used by the companies in this case to build smart products and provide smart services? What other IT components might be used? Give examples of the capabilities they would provide.
3.What are some limitations of a smart products and smart services strategy? Give several examples of challenges that a business might encounter, and explain how it might overcome them.

Real World Internet Activity

1.Use the Internet to investigate how Heidelberg, Honeywell, and Eaton are proceeding in their use of smart products and services.
–Discover if they are expanding this approach and what benefits they are claiming for this strategy.
2.Now expand your Internet investigation to other manufacturing companies to find several that are building smart products and offering smart services.
–What business value are they claiming for themselves and their customers?
–If this search is fruitless, select several companies from your Internet research and explain how and why they might employ a smart products and services strategy.

3.What security and privacy concerns might consumers have about Eaton's Home Heartbeat service?
–Discuss the rationale for these concerns, and consider what could be done to reduce any threats to security and privacy posed by such services while also improving the value of this new use of information technology.