E-Business: How Businesses Use Information Systems

- **Business processes:**
  - Workflows of material, information, knowledge
  - Sets of activities, steps
  - May be tied to functional area or be cross-functional
- **Businesses**: Can be seen as collection of business processes
- Business processes may be assets or liabilities

- **Examples of functional business processes**
  - **Manufacturing and production**
    - Assembling the product
  - **Sales and marketing**
    - Identifying customers
  - **Finance and accounting**
    - Creating financial statements
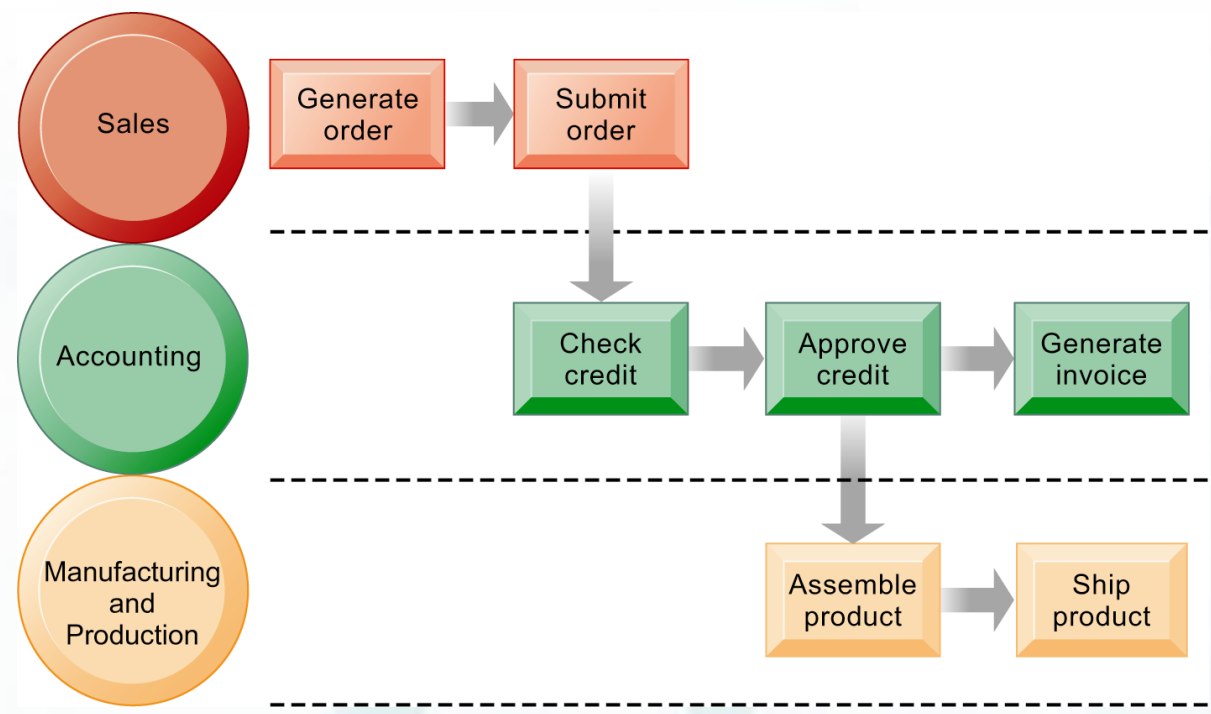 - **Human resources**
    - Hiring employees

Business Processes and Information Systems

The Order Fulfillment Process

Fulfilling a customer order involves a complex set of steps that requires the close coordination of the sales, accounting, and manufacturing functions.

Figure 2-1

- **Information technology enhances business processes in two main ways:**

  - **Increasing efficiency of existing processes**
    - Automating steps that were manual

  - **Enabling entirely new processes that are capable of transforming the businesses**
    - Change flow of information
    - Replace sequential steps with parallel steps
    - Eliminate delays in decision making

- **Systems from a functional perspective**

  - **Sales and marketing systems**

  - **Manufacturing and production systems**

  - **Finance and accounting systems**

  - **Human resources systems**

- **Sales and marketing systems**
  - Functional concerns include:
    - Sales management, customer identification market research, advertising and promotion, pricing, new products
  - Examples of systems:
    - Order processing (operational level)
    - Pricing analysis (middle mgmt)
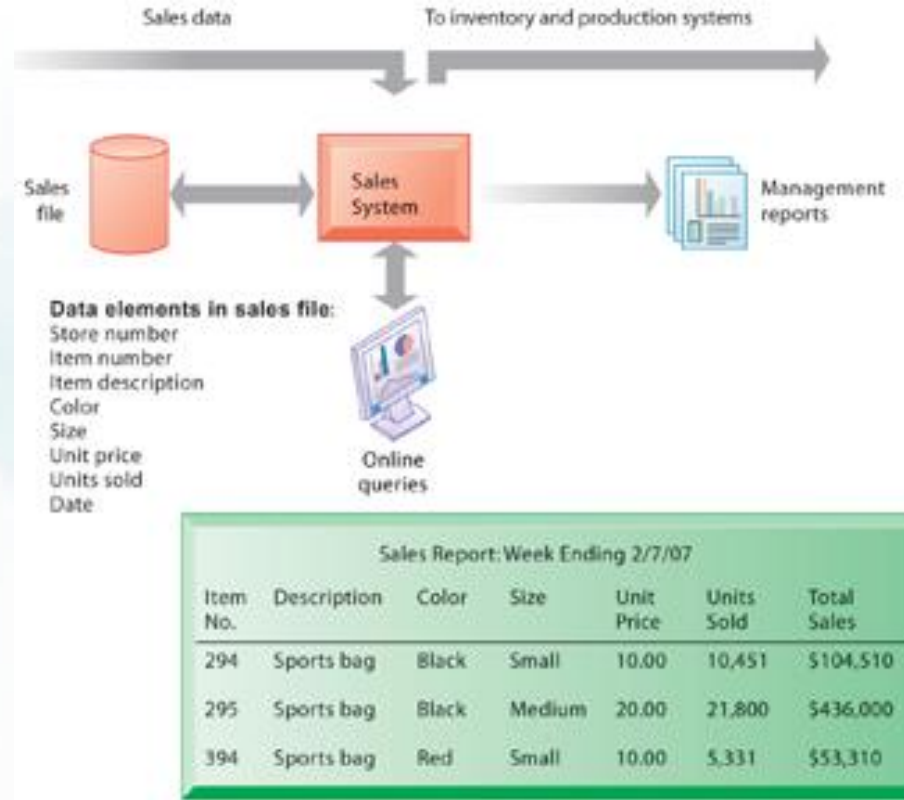   - Sales trend forecasting (senior mgmt)

Example of a Sales Information System

This system captures sales data at the moment the sale takes place to help the business monitor sales transactions and to provide information to help management analyze sales trends and the effectiveness of marketing campaigns.

Figure 2-2

- **Manufacturing and production systems**
  - Functional concerns include:
    - Managing production facilities, production goals, production materials, and scheduling
  - Examples of systems:
    - Machine control (operational mgmt)
    - Production planning (middle mgmt)
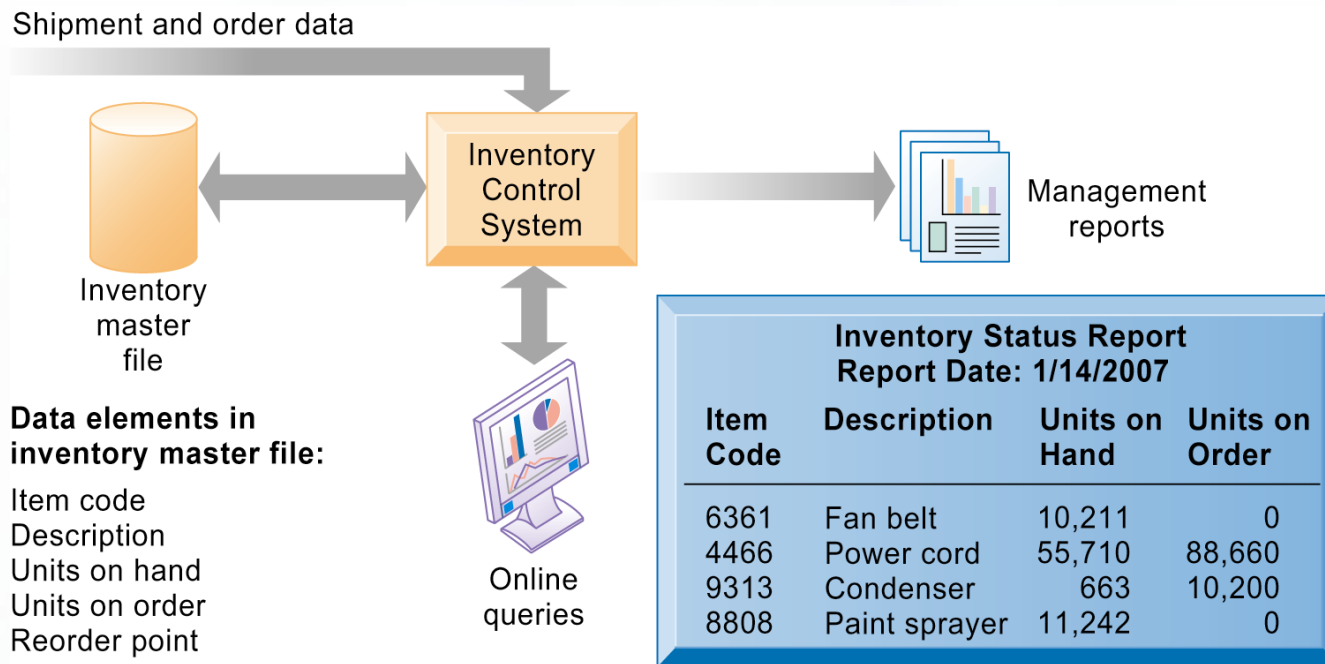   - Facilities location (senior mgmt)

Types of Business Information Systems

Overview of an Inventory System

Shipment and order data

Inventory master file

Data elements in inventory master file:

Item code
Description
Units on hand
Units on order
Reorder point

Inventory Control System

Management reports

Online queries

Inventory Status Report
Report Date: 1/14/2007

Item Code	Description	Units on Hand	Units on Order
6361	Fan belt	10,211	0
4466	Power cord	55,710	88,660
9313	Condenser	663	10,200
8808	Paint sprayer	11,242	0

This system provides information about the number of items available in inventory to support manufacturing and production activities.

Figure 2-3

- **Finance and accounting systems**
  - Functional concerns include:
    - Managing financial assets (cash, stocks, etc.) and capitalization of firm, and managing firm's financial records
  - Examples of systems:
    - Accounts receivable (operational mgmt)
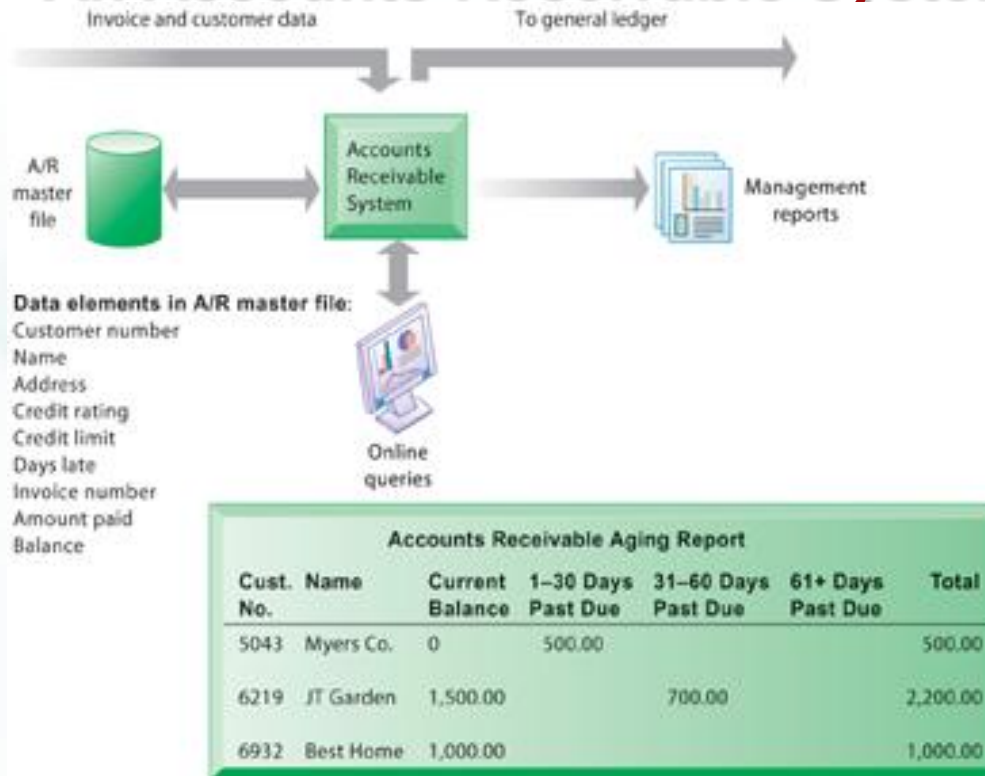   - Budgeting (middle mgmt)
    - Profit planning (senior mgmt)

Types of Business Information Systems

An Accounts Receivable System

An accounts receivable system tracks and stores important customer data, such as payment history, credit rating, and billing history.

Figure 2-4

- **Human resource systems**
  - Functional concerns include:
    - Identifying potential employees, maintaining employee records, creating programs to develop employee talent and skills
  - Examples of systems:
    - Training and development (operational mgmt)
    - Compensation analysis (middle mgmt)
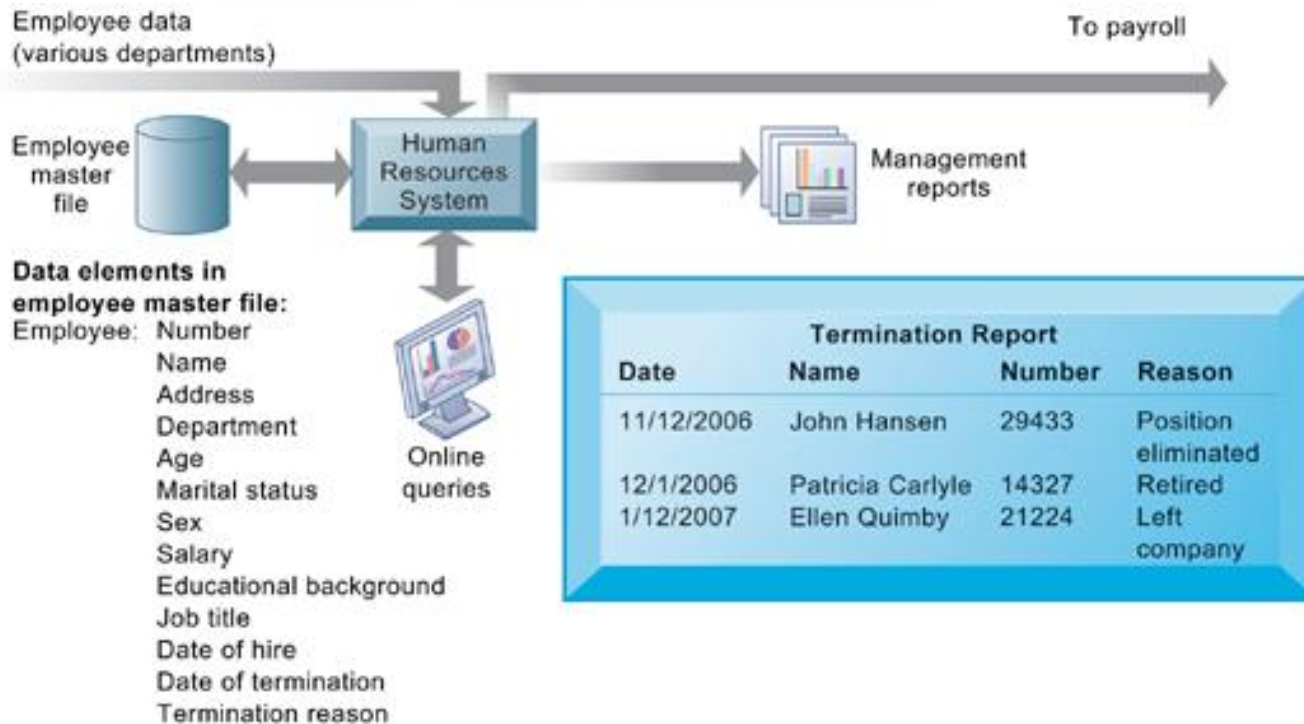   - Human resources planning (senior mgmt)

Types of Business Information Systems

An Employee Record Keeping System

This system maintains data on the firm's employees to support the human resources function.

Figure 2-5

- **Systems from a constituency perspective**

  – **Transaction processing systems: supporting operational level employees**

  – **Management information systems and decision-support systems: supporting managers**

  – **Executive support systems: supporting executives**

- **Transaction processing systems**
  - Perform and record daily routine transactions necessary to conduct business
    - E.g. sales order entry, payroll, shipping
  - Allow managers to monitor status of operations and relations with external environment
  - Serve operational levels
  - Serve predefined, structured goals and decision making

- **Management information systems**
  - Serve middle management
  - Provide reports on firm's current performance, based on data from TPS
  - Provide answers to routine questions with predefined procedure for answering them
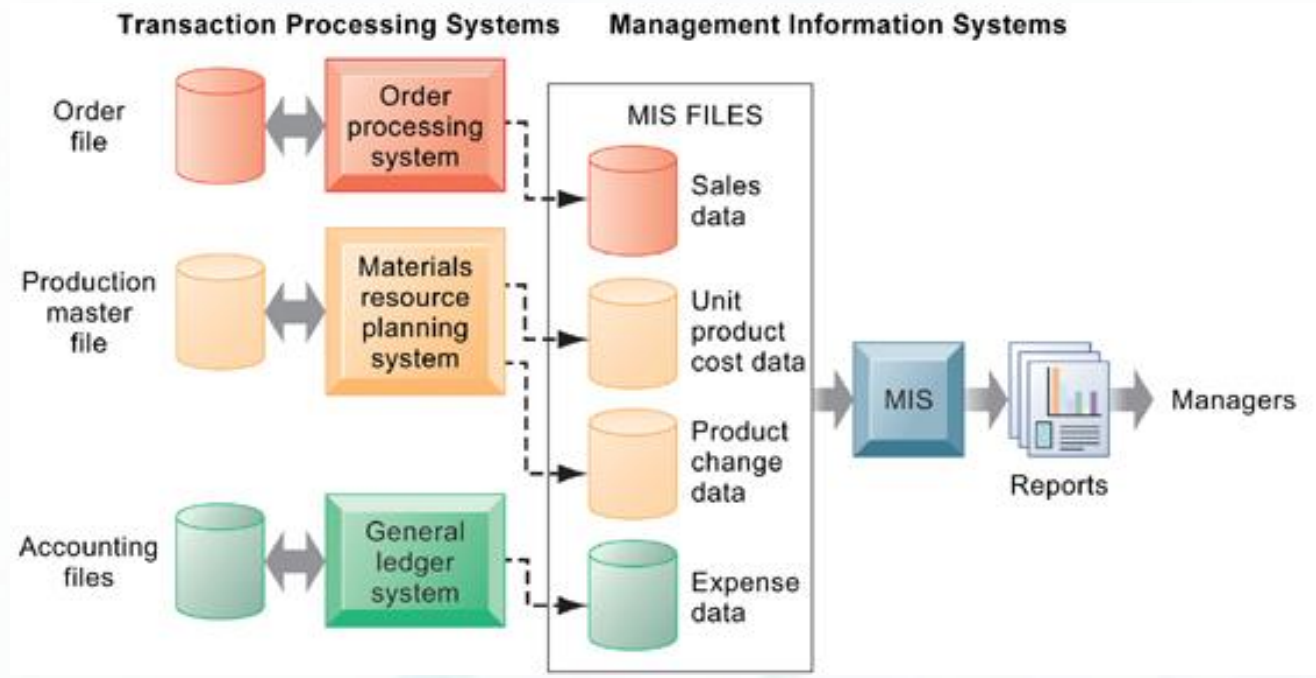 - Typically have little analytic capability

How Management Information Systems Obtain their Data from the Organization's TPS

In the system illustrated by this diagram, three TPS supply summarized transaction data to the MIS reporting system at the end of the time period. Managers gain access to the organizational data through the MIS, which provides them with the appropriate reports.

Figure 2-6

Sample MIS Report

Consolidated Consumer Products Corporation Sales by Product and Sales Region: 2007

PRODUCT CODE	PRODUCT DESCRIPTION	SALES REGION	ACTUAL SALES	PLANNED	ACTUAL versus PLANNED
4469	Carpet Cleaner	Northeast	4,066,700	4,800,000	0.85
		South	3,778,112	3,750,000	1.01
		Midwest	4,867,001	4,600,000	1.06
		West	4,003,440	4,400,000	0.91
	TOTAL		16,715,253	17,550,000	0.95
5674	Room Freshener	Northeast	3,676,700	3,900,000	0.94
		South	5,608,112	4,700,000	1.19
		Midwest	4,711,001	4,200,000	1.12
		West	4,563,440	4,900,000	0.93
	TOTAL		18,559,253	17,700,000	1.05

This report, showing summarized annual sales data, was produced by the MIS in Figure 2-6.

Figure 2-7

- **Decision support systems**
  - Serve middle management
  - Support nonroutine decision making
    - E.g. What is impact on production schedule if December sales doubled?
  - Often use external information as well from TPS and MIS
  - Model driven DSS
    - Voyage-estimating systems
  - Data driven DSS
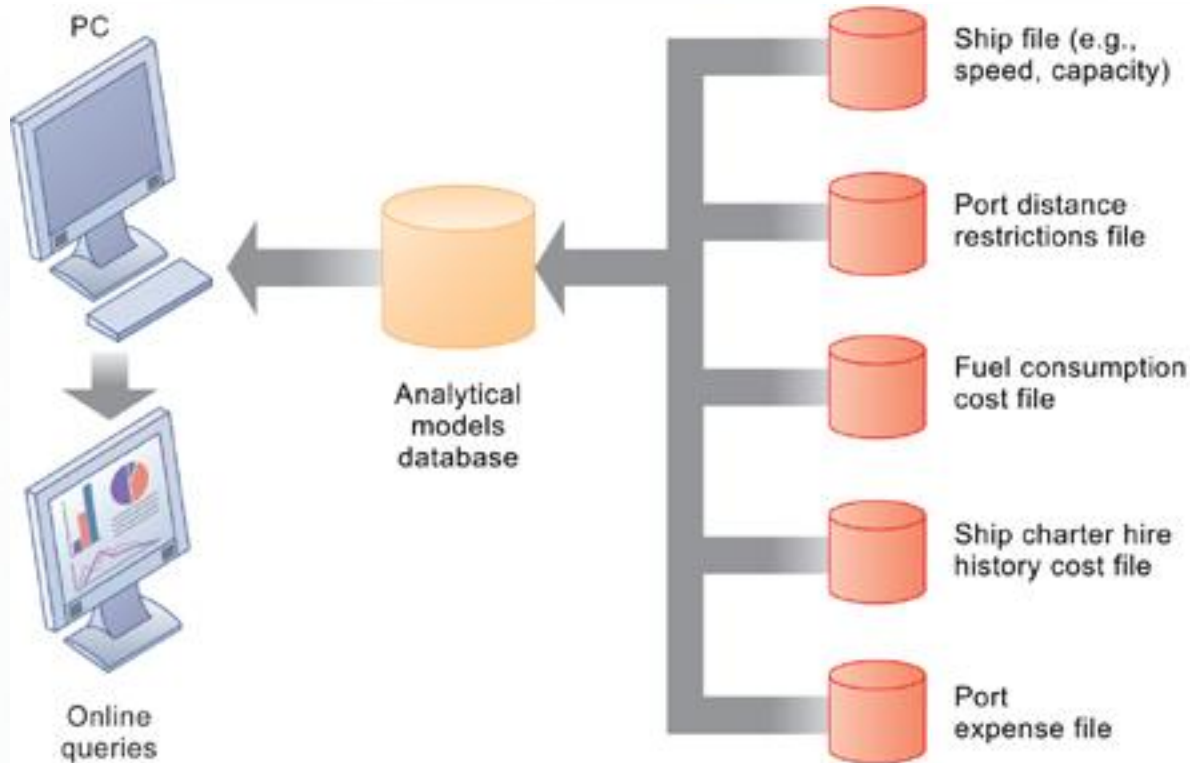   - Intrawest's marketing analysis systems

Types of Business Information Systems

Voyage-Estimating Decision-Support System

This DSS operates on a powerful PC. It is used daily by managers who must develop bids on shipping contracts.

Figure 2-8

- **Executive support systems**

  – Support senior management

  – Address nonroutine decisions requiring judgment, evaluation, and insight

  – Incorporate data about external events (e.g. new tax laws or competitors) as well as summarized information from internal MIS and DSS

  – E.g. ESS that provides minute-to-minute view of firm's financial performance as measured by working capital, accounts receivable, accounts payable, cash flow, and inventory.
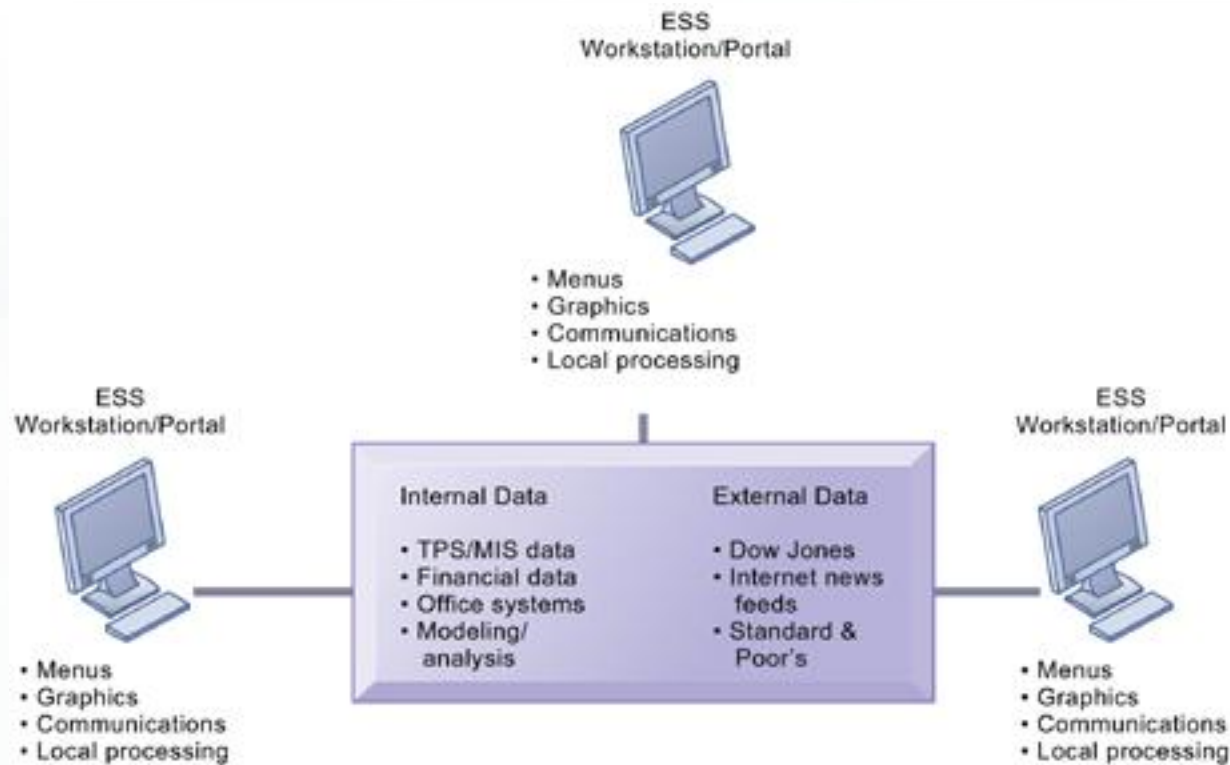
Model of an Executive Support System

This system pools data from diverse internal and external sources and makes them available to executives in an easy-to-use form.

Figure 2-9

- **Relationship of systems to one another**

  – TPS: Major source of data for other systems

  – ESS: Recipient of data from lower-level systems

  – Data may be exchanged between systems

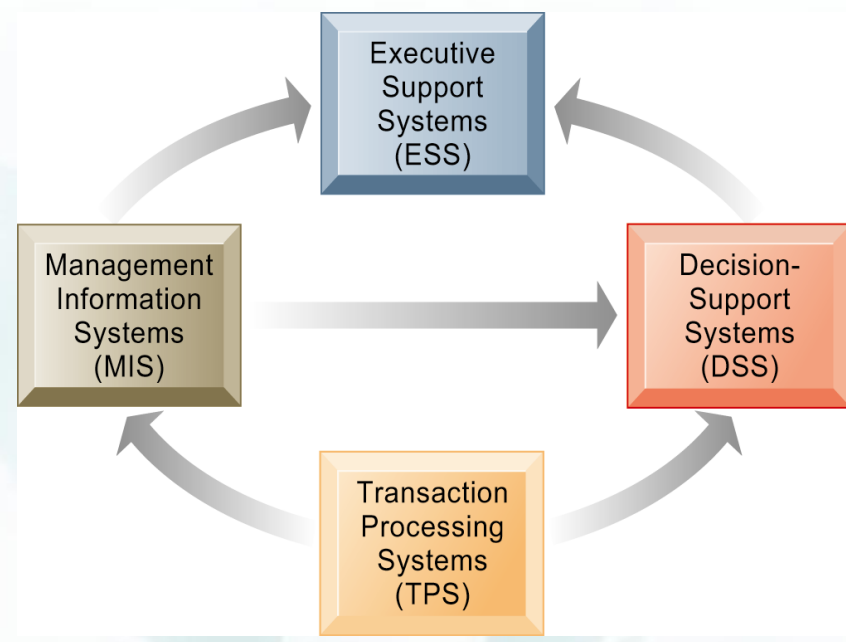 – In reality, most businesses' systems only loosely integrated

Types of Business Information Systems

Interrelationships Among Systems

The various types of systems in the organization have interdependencies. TPS are major producers of information that is required by many other systems in the firm, which, in turn, produce information for other systems. These different types of systems are loosely coupled in most business firms, but increasingly firms are using new technologies to integrate information that resides in many different systems.

Figure 2-10

Systems That Span the Enterprise

- **Enterprise applications**
  - Span functional areas
  - Execute business processes across firm
  - Include all levels of management
  - Four major applications:
    - Enterprise systems
    - Supply chain management systems
    - Customer relationship management systems
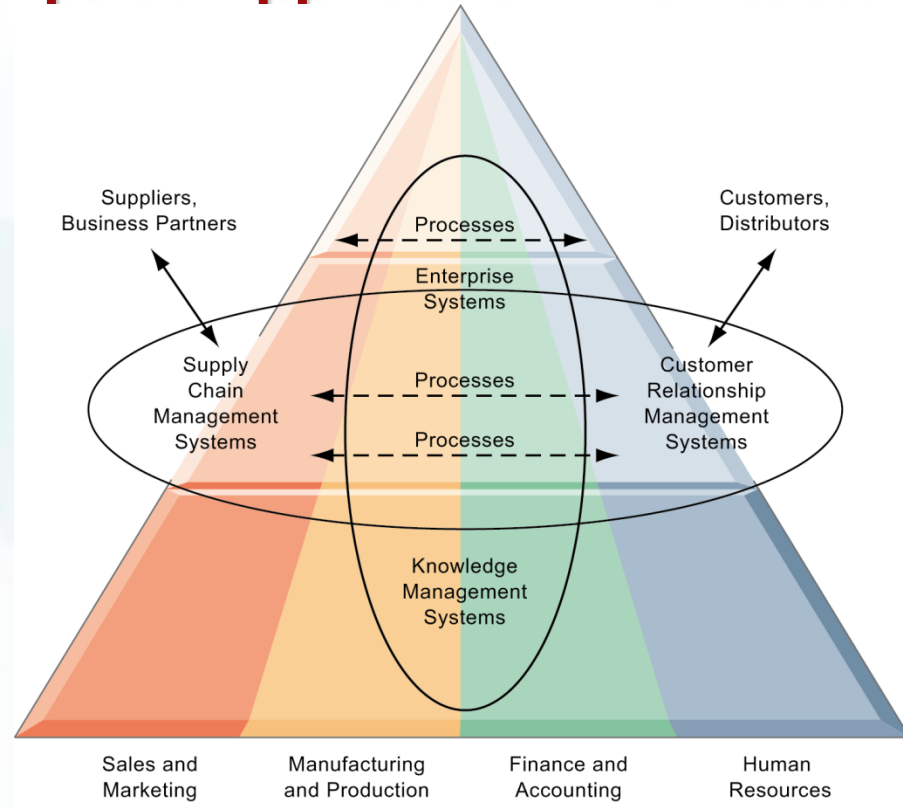   - Knowledge management systems

Systems That Span the Enterprise

Enterprise Application Architecture

Enterprise applications automate processes that span multiple business functions and organizational levels and may extend outside the organization.

Figure 2-11

- **Enterprise systems**
  - Collects data from different firm functions and stores data in single central data repository
  - Resolves problem of fragmented, redundant data sets and systems
  - Enable:
    - Coordination of daily activities
    - Efficient response to customer orders (production, inventory)
    - Provide valuable information for improving management decision making
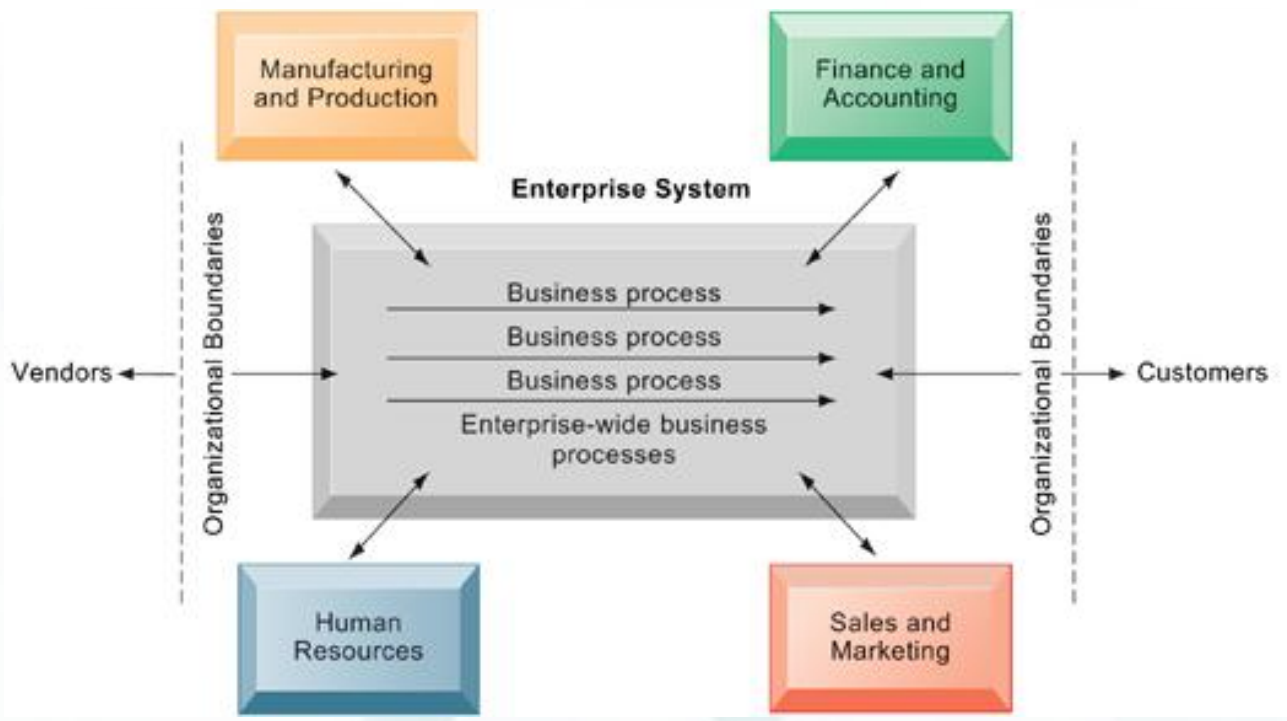
Types of Business Information Systems

Enterprise Systems

Enterprise systems integrate the key business processes of an entire firm into a single software system that enables information to flow seamlessly throughout the organization. These systems focus primarily on internal processes but may include transactions with customers and vendors.

Figure 2-12

- **Supply chain management systems**
  - **Manage firm's relationships with suppliers**
  - **Share information about**
    - **Orders, production, inventory levels, delivery of products and services**
  - **Goal: Right amount of products to destination with least amount of time and lowest cost**
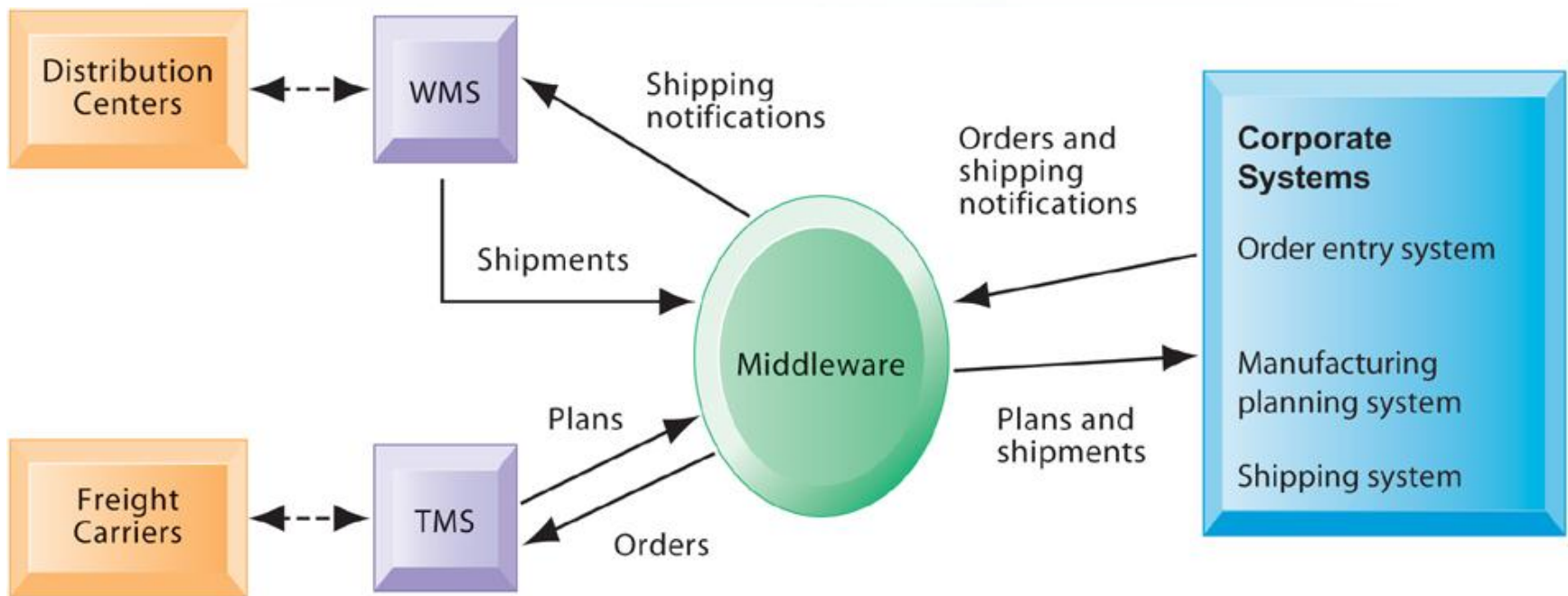
Example of a Supply Chain Management System

Customer orders, shipping notifications, optimized shipping plans, and other supply chain information flow among Haworth's Warehouse Management System (WMS), Transportation Management System (TMS), and its back-end corporate systems.

Figure 2-13

- **Customer relationship management systems:**
  - Provide information to coordinate all of the business processes that deal with customers in sales, marketing, and service to optimize revenue, customer satisfaction, and customer retention.

  - Integrate firm's customer-related processes and consolidate customer information from multiple communication channels
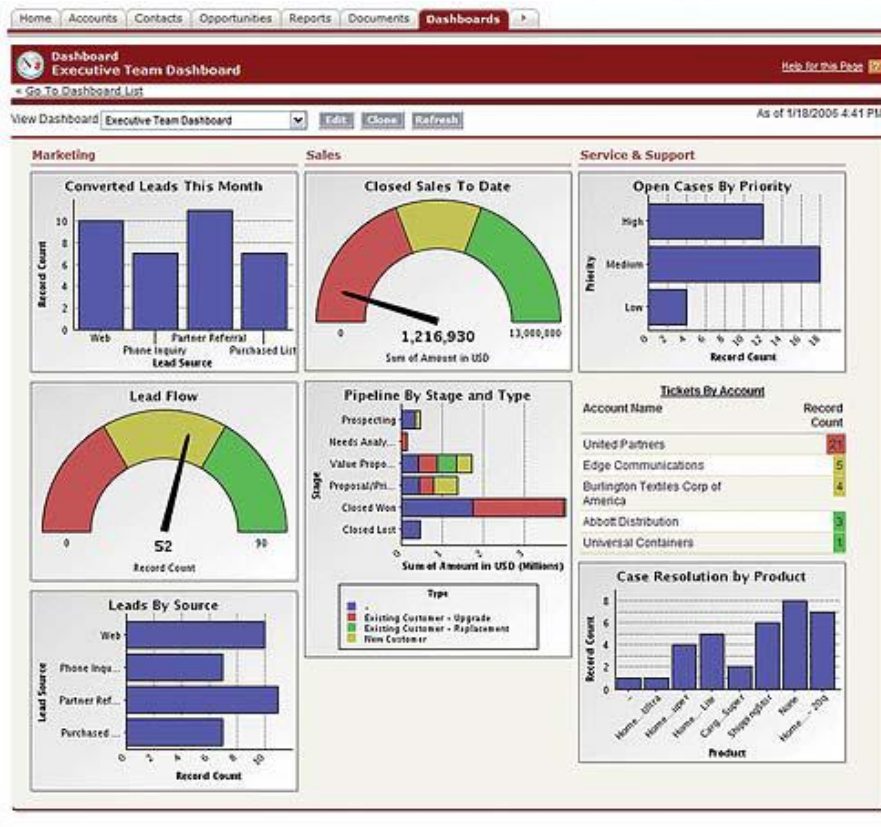
Types of Business Information Systems

Salesforce.com Executive Team Dashboard

Some of the capabilities of salesforce.com, a market-leading provider of on-demand customer relationship management (CRM) software. CRM systems integrate information from sales, marketing, and customer service.

- **Knowledge management systems**
  - Support processes for acquiring, creating, storing, distributing, applying, integrating knowledge
  - Collect internal knowledge and link to external knowledge
  - Include enterprise-wide systems for:
    - Managing documents, graphics and other digital knowledge objects
    - Directories of employees with expertise

- **Intranets:**
  - Internal networks built with same tools and standards as Internet
  - Used for internal distribution of information to employees
  - Typically utilize private portal providing single point of access to several systems
  - May connect to company's transaction systems

- **Extranets:**
  - Intranets extended to authorized users outside the company
  - Expedite flow of information between firm and its suppliers and customers
  - Can be used to allow different firms to collaborate on product design, marketing, and production

- **E-business (Electronic business):**
  - Use of digital technology and Internet to execute major business processes in the enterprise
  - Includes **e-commerce** (electronic commerce):
    - Buying and selling of goods over Internet

- **E-government:**
  - The application of Internet and networking technologies to digitally enable government and public sector agencies' relationships with citizens, businesses, and other arms of government

- **Information systems department:**
  - Formal organizational unit responsible for information technology services
  - Includes programmers, systems analysts, project leaders, information systems managers
  - Often headed by chief information officer (CIO)
- **End-users:**
  - Representatives of other departments, for whom applications are developed

- Small firm may not have formal information systems group
- Larger companies typically have separate department which may be organized along one of several different lines:

  - Decentralized (within each functional area)
  - Separate department under central control
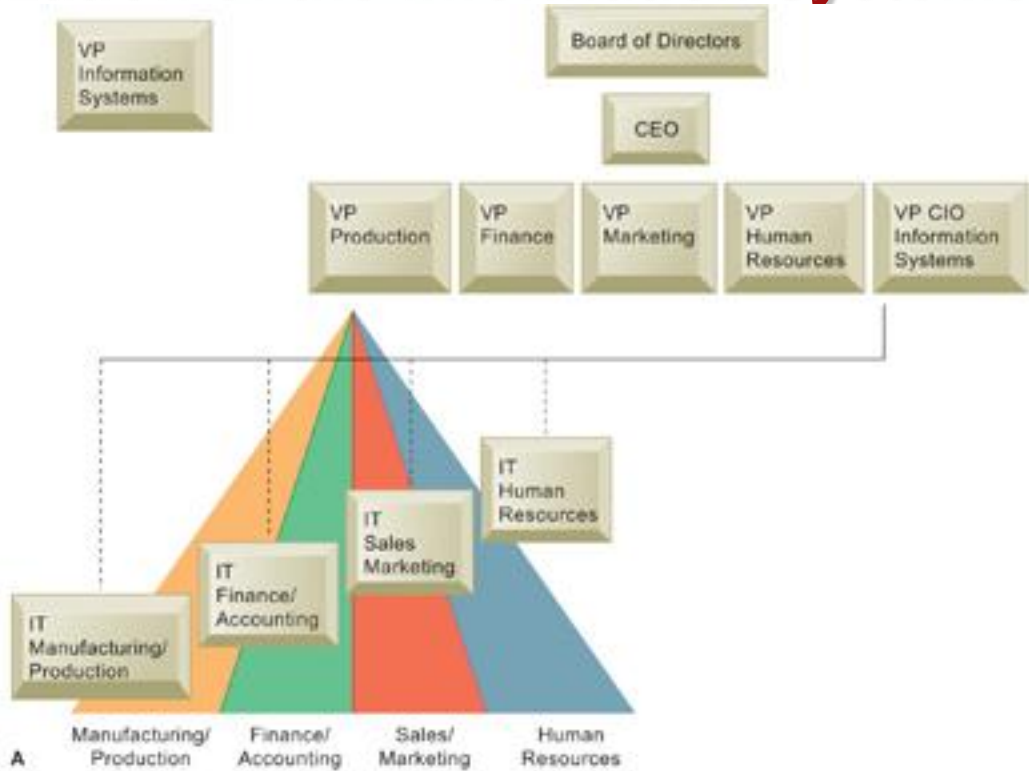 - Each division has separate group but all under central control

Organization of the Information Systems Function

There are alternative ways of organizing the information systems function within the business: within each functional area (A), as a separate department under central control (B), or represented in each division of a large multidivisional company but under centralized control (C).
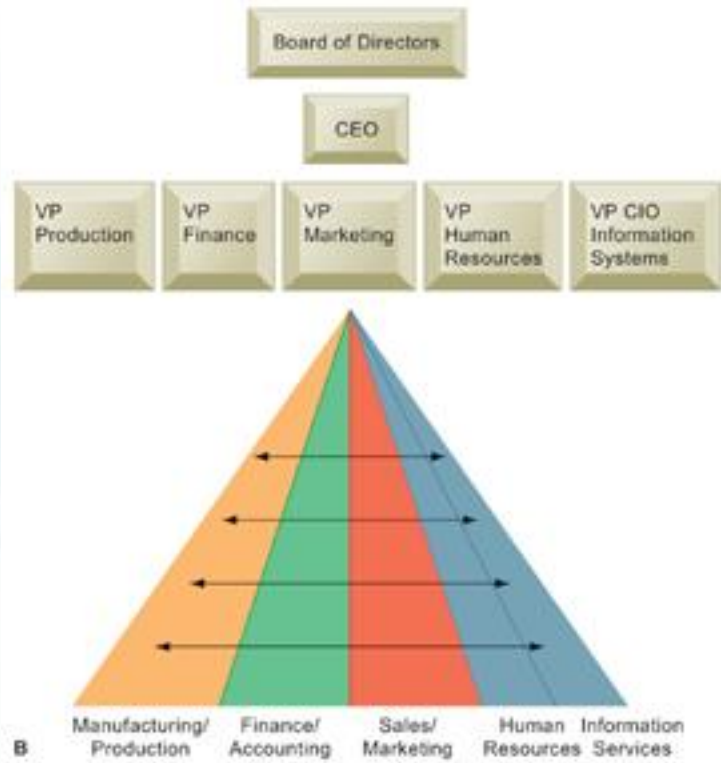
Figure 2-14

Organization of the Information Systems Function

B: A separate department under central control

Figure 2-14 (cont)

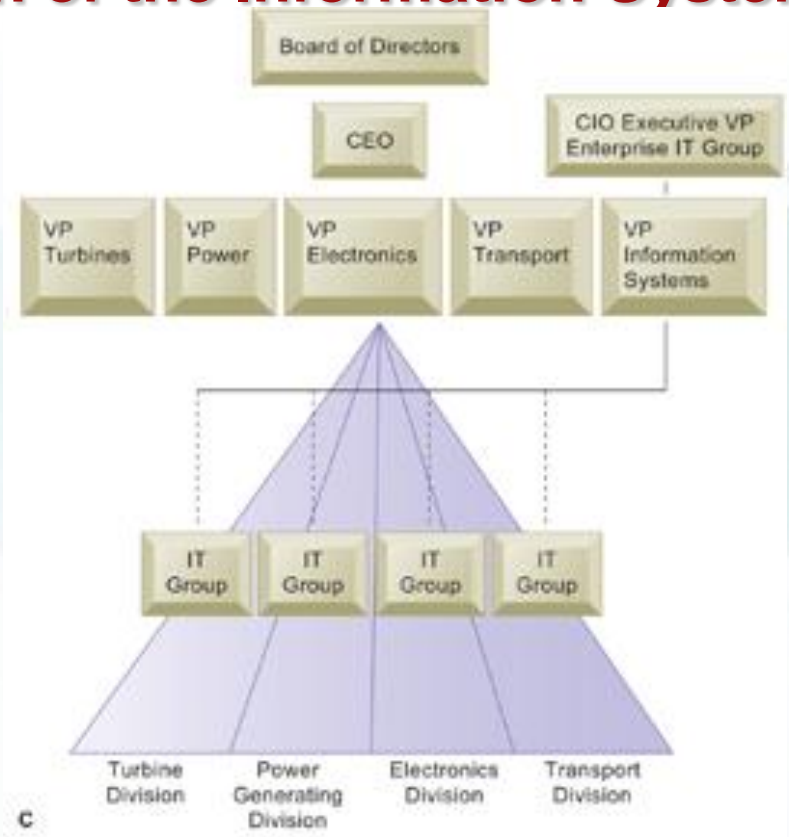# Organization of the Information Systems Function

C: Represented in each division of a large multidivisional company but under centralized control

Figure 2-14 (cont)