Information Systems that Support Organizations

Chapter Outline

- Transaction Processing Systems
- Functional Area Management Information Systems
- Enterprise Resource Planning Systems
- Supply Chain Management Systems
- Customer Relationship Management Systems

Learning Objectives

- Describe transaction processing system.
- Describe management information systems and the support they provide for each functional area of the organization.
- Describe enterprise resource planning systems.

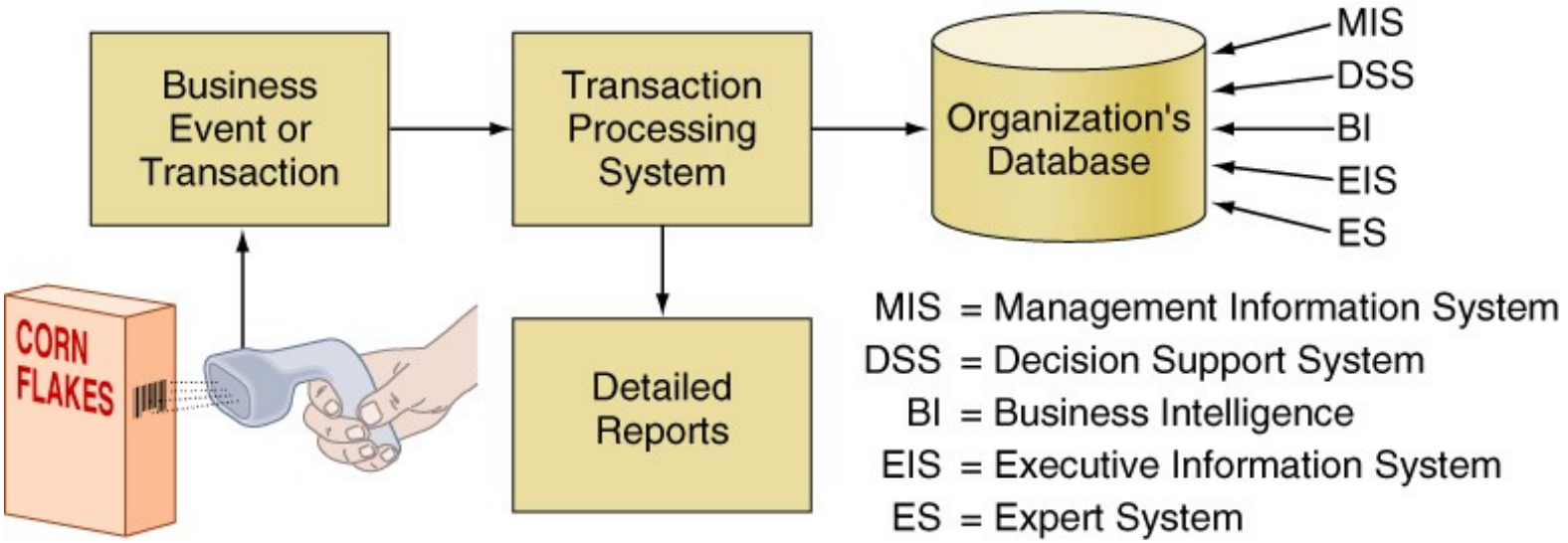
Learning Objectives (continued)

- Describe customer relationship management systems.
- Describe supply chain management systems.
- Discuss electronic data interchange, extranets, and Web services.

Transaction Processing Systems

- **Transaction Processing System (TPS)** monitors, collects, stores and processes data generated from all business transactions.
  - Enable core operations of an organization
  - Typically involves high amount of data, and transactions rates, regular basis, high level of detail, high integrity and security concerns,...
- ***Source data automation*** is the process of automating the TPS data entry as much as possible because of the large volume involved.

The flow of information in TPS



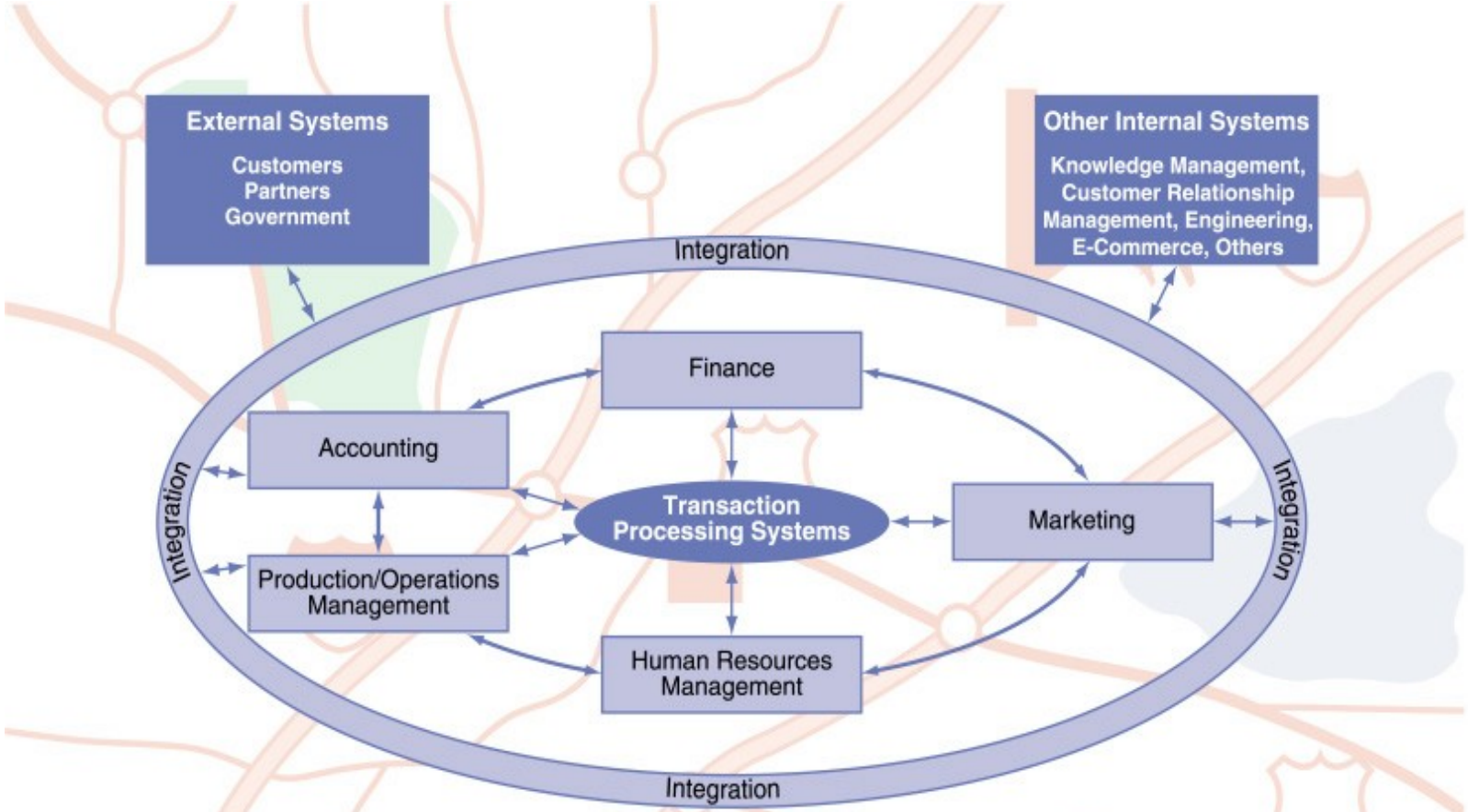
TPSs (continued)

- **Batch Processing** is when the firm collects data from transactions as they occur, placing them in group or *batches*, then prepares and processes the batches periodically (e.g. every night).
- **Online Transaction Processing (OLTP)** is when business transactions are processed online as soon as they occur.

Functional Information Systems

- **Functional Information Systems** also called **Management Information Systems (MISs)** or **Functional Area IS** provide information to managers (usually middle-level managers) in the functional areas.
- MISs support planning, organizing, and controlling operations.

Functional Information Systems



Information Systems for Specific Functional Areas

- Information Systems that are designed to support a functional area by increasing its internal effectiveness and efficiency in the following areas: accounting, finance, marketing, operations (POM), and human resources management functional areas.

Functional Information Systems

- Functional information Systems can be divided into two general categories: function-specific and function- general . The most common type of function-general system, is management information systems (MISs)

Management Information System (MIS)

- A system that provides information to managers in the functional areas, in order to support managerial tasks of planning, organizing, and controlling operations.

An MIS produces routine, ad-hoc (on-demand) and exception report:

- Ad-hoc (on-demand) reports: Non-routine reports.
- Drilldown report: Reports that show a greater level of detail than is included in routine reports.
- Key-indicator reports. Reports that summarize the performance of critical activities.
- Comparative reports. Reports that compare performance of different business units or time periods.
- Exception report. Report that include only information that exceeds certain threshold standard

Financial planning and budgeting

- Financial and economic forecasting
- Budgeting
- Expense Management Automation (EMA). Systems that automate data entry and processing of travel and entertainment expenses.
- Investment management
  - Access to financial and economic reports
  - Financial analysis

Control and auditing

- Budgetary control
- Auditing
- Product pricing
- Contract management
- Profitability analysis and cost control

Marketing

- Customer profile and preference analysis
- Prospective customer lists and marketing databases
- Mass customization
- Personalization
- Planning advertising and promotions

Marketing ct'd

- Pricing of products or services
- Salesperson productivity (sales force automation, sales productivity software)
- Profitability analysis
- Sales Analysis and trends
- New products, services and marketing planning

Production/ operations and logistics

- In-house logistics and materials management
- Inventory management
- Quality control

Planning production and operations

- Material requirement planning: A planning process that integrates production, purchasing and inventory management of interdependent items.
- Manufacturing resource planning: A planning process that integrates an enterprise's production, inventory management, purchasing, financing and labor activities.
- Just- in- time systems: Inventory scheduling system in which materials and parts arrive at a workplace just when needed

Computer-integrated manufacturing

- Computer-integrated manufacturing (CIM). Manufacturing approach that integrates several computerized systems such as CAD, CAM, MRP and JIT into a whole, in a factory.

Human Resources Systems

- Using the web for recruitment,
- HRM portals and salary surveys.
- Human Resources Maintenance and Development
  - Performance evaluation
  - Training and HR development
- Human Resources Management: Payroll and employee records
  - Benefit administration
  - Employee relationship management

Functional Information Systems

- Discussion
  - What could be problems associated with having several function information systems in a company?
  - How could these problems be solved?

Integration: Internal vs. External

- Internal integration refers to integration within a company between (or among) applications, and/or between applications and databases.
- External integration refers to integration of applications and databases among business partners.
- Enterprise Resource Planning (ERP) vs. Supply Chain Management (SCM) and Customer Relationship Management (CRM)

Enterprise Resource Planning Systems

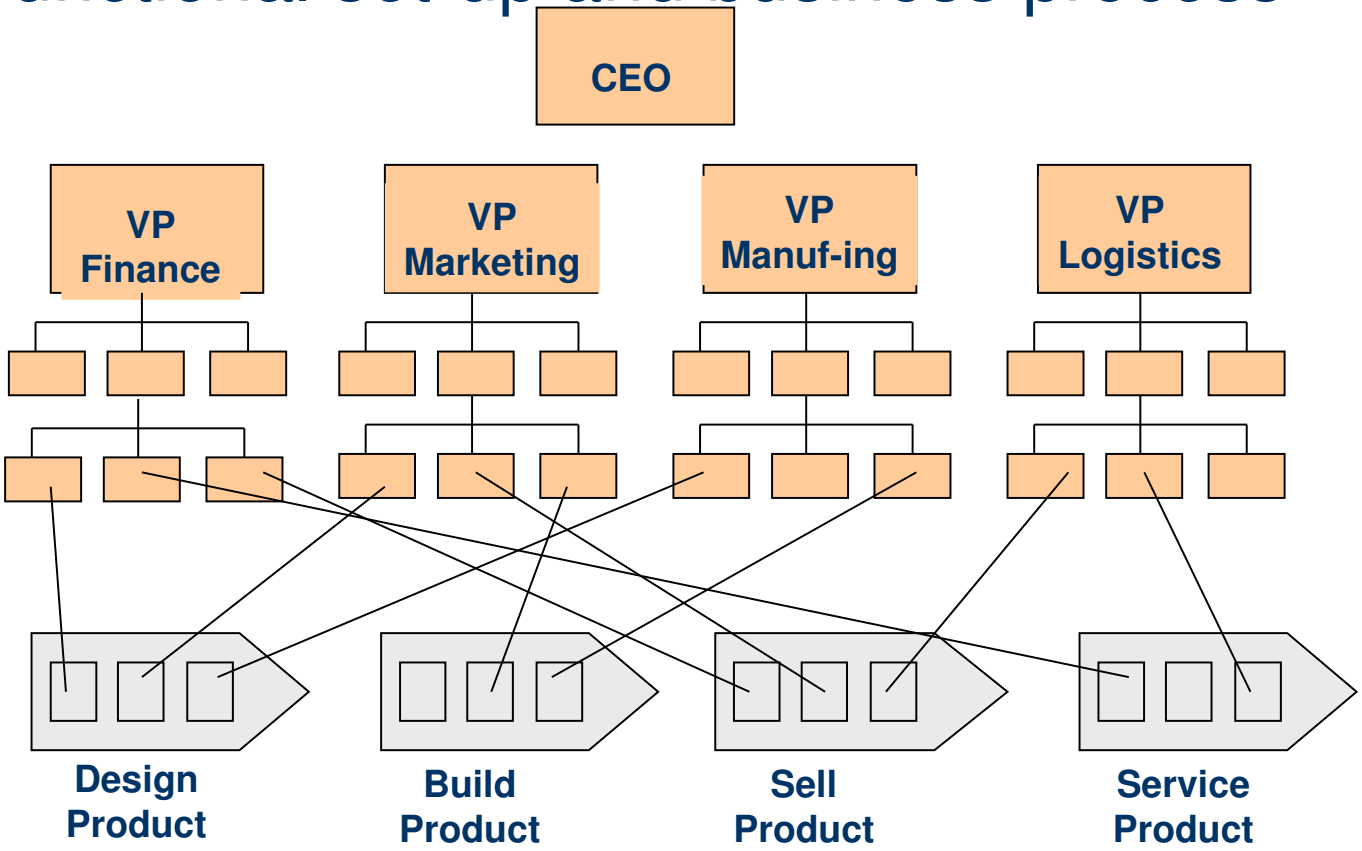
- **Enterprise Resource Planning (ERP) systems** integrate the planning, management and use of all resources of the organization.
- ERP's major objective is to tightly integrate the functional areas of the organization and to enable seamless information flows across the functional areas.
- Allows for some "customizing" (adaptation to specific company).

ERP Systems (continued)

- **Business process** is a set of related steps or procedures designed to produce a specific outcome.
- Business processes supported by ERP modules include Financial and Accounting Processes, Sales and Marketing Processes, Manufacturing and Production Processes and Human Resources Processes.

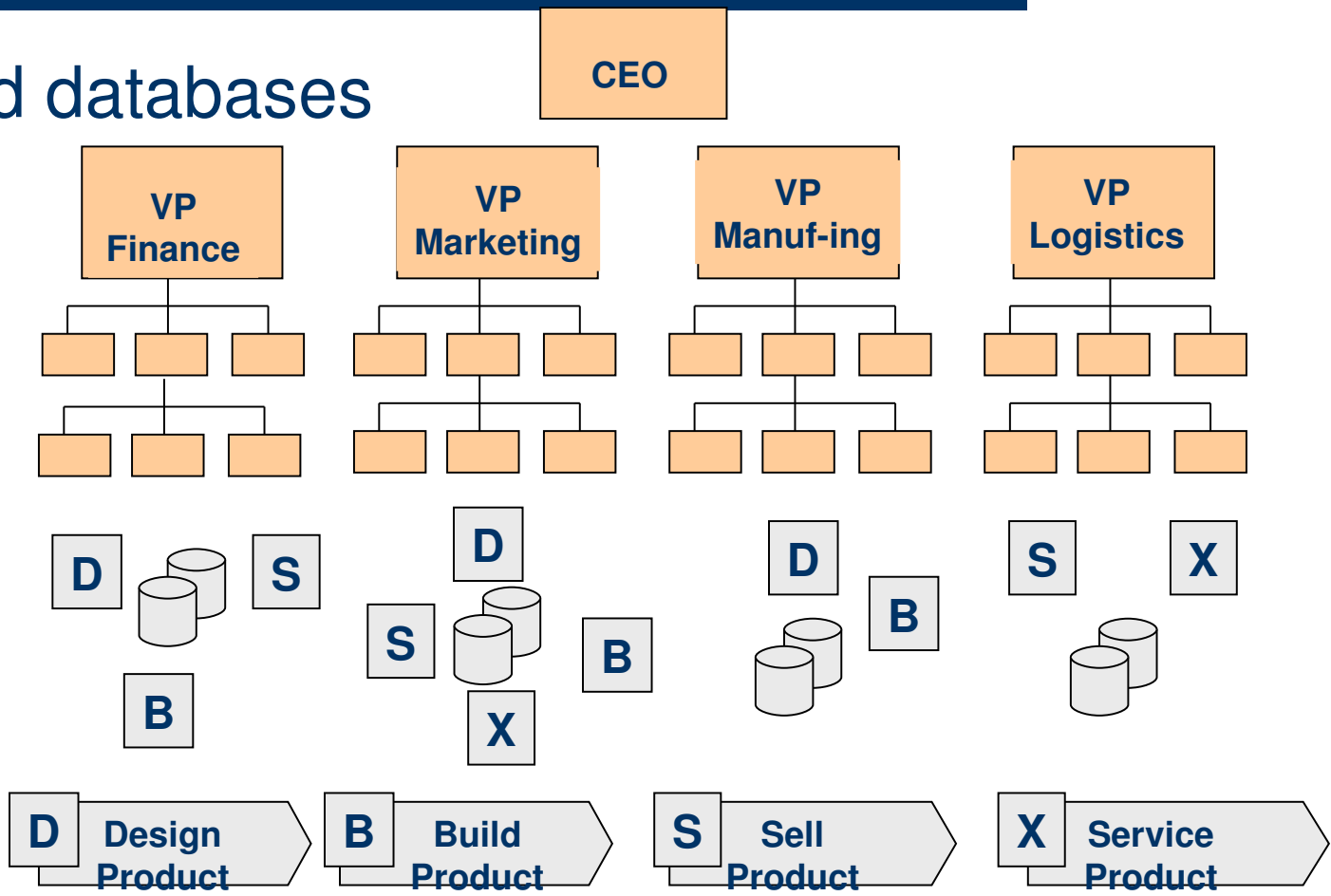
ERP Systems (continued)

- Functional set-up and business process



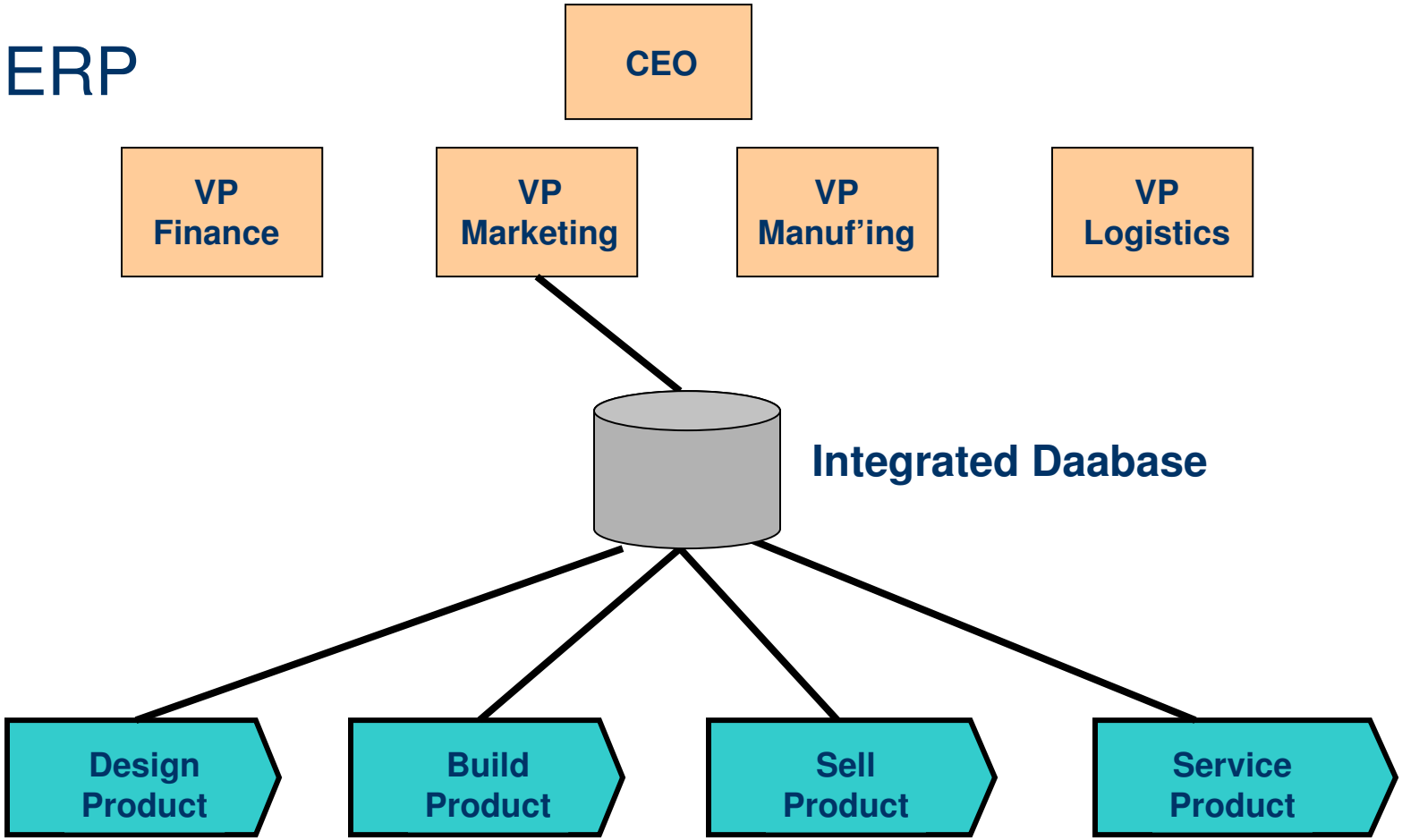
ERP Systems (continued)

- Isolated databases



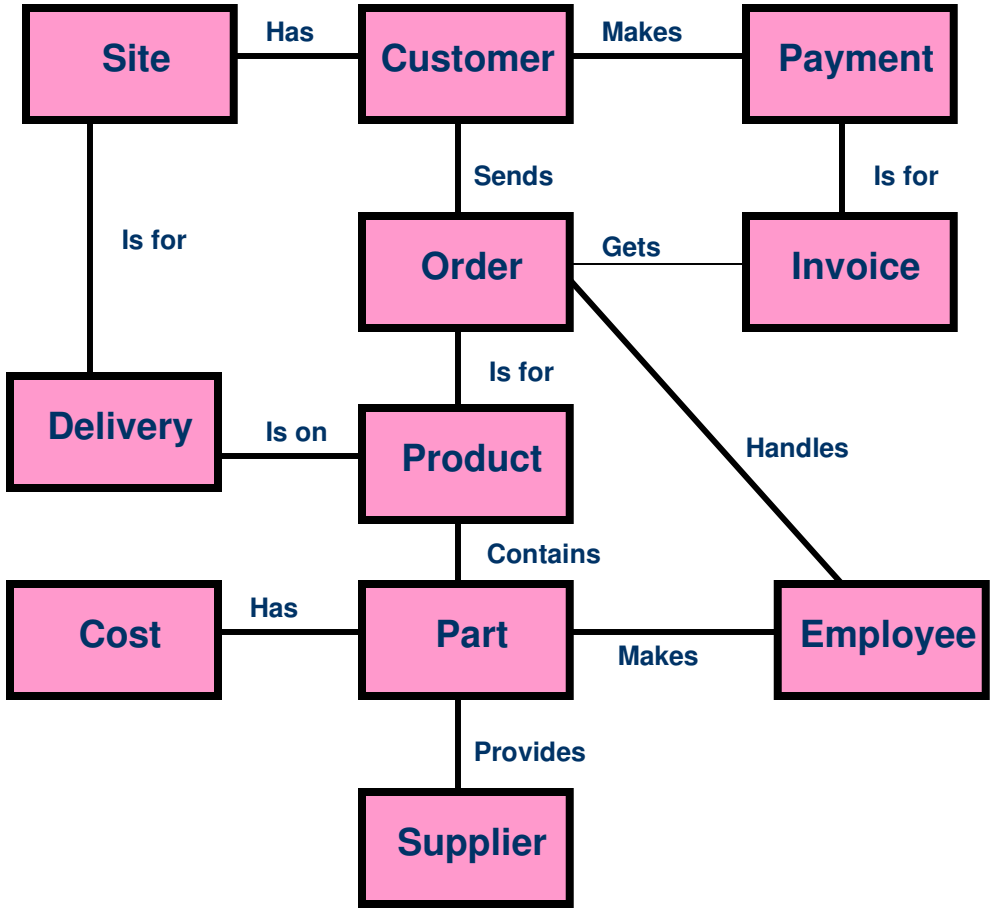
ERP Systems (continued)

- ERP



ERP Systems (continued)

- ERP database based on logical model



ERP Systems (continued)

- **Best practices** are the most successful solutions or problem-solving methods for achieving a business objective.
- Drawbacks to ERP systems are that they can be extremely complex, expensive and time-consuming to implement.
- Leading ERP software vendors include SAP (SAP R/3), Oracle and Microsoft / Navision.

ERP Systems

- Discussion
  - ERP systems implement best practices, and thus allow for learning in management concepts. What might be drawbacks in this?
  - If customizing is not enough to adapt the software to a company's needs, the program code can be changed. What might be problems resulting from this?

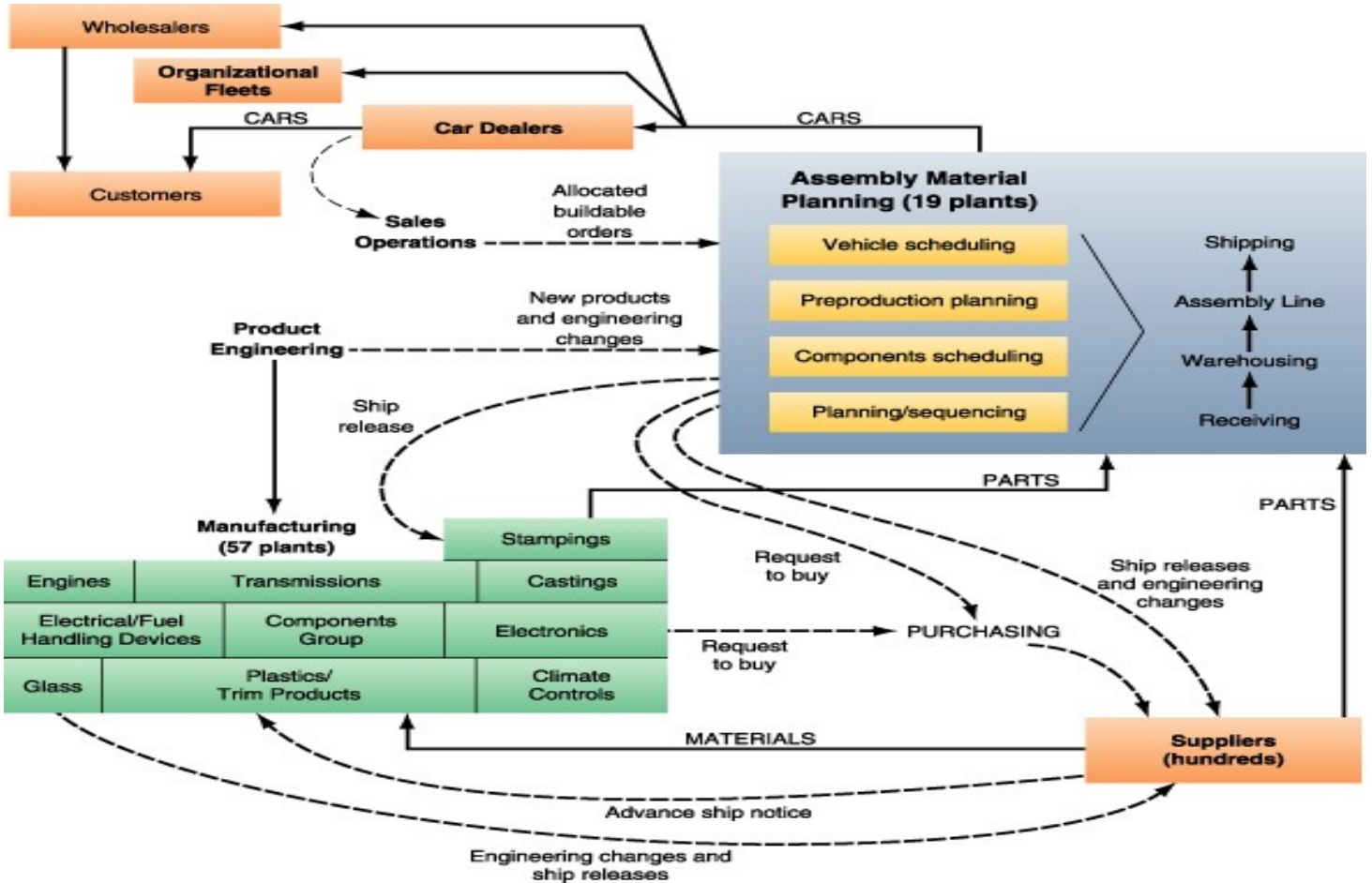
Supply Chain Definitions

- Supply chain: The flow of materials, information, money, and services from raw material suppliers, through factories and warehouses to the end customer; includes the organizations and processes
- Supply chain management (SCM): The planning, organizing and coordinating of all supply chain's activities.
- E-supply chain: A supply chain that is managed electronically usually with Web-based software.

The Flows in the Supply Chain

- Materials flows: These are all physical products, raw materials, supplies, and so forth, that flow along the chain. The concept of materials flows include reverse flows - returned products, recycled products and disposal of materials or products.
- Information flows: All data related to demand, shipments, orders, returns, and schedules.
- Financial flows: All transfers of money, payments, credit card information and authorization, payment schedules, e-payments and credit related data.

An Automotive Supply Chain



Example: American Hospital Supply Corporation (AHSC)

- AHSC sold products through travelling sales people who filled in order forms and mailed to HQ
  - a typical customer: a hospital with 800 beds
    - 30,000 different products
    - about 10 separate purchasing units (pharmacy, cafeteria, etc.)
    - about 50,000 orders per year
  - difficult to process
  - prone to errors

The Problem Customer (early 60s)

- One customer complained heavily about delivery speed and errors
- A creative manager in AHSC developed the following system
  - a dataphone (IBM 1001) was installed at the hospital's purchasing department
  - the dataphone could process preprinted cards and pass the data over the phone line
  - the dataphone was connected to a card printer (IBM 026) at the AHSC distribution center
  - the hospital was given preprinted cards for every single item they purchase from AHSC

The Problem Customer (early 60s)

- these cards were placed in the storage area right above the safety stock of each item
- as items were consumed, when a card was reached, this prompted an order
- the card was taken from the shelf and placed in a box
- at the end of the day, all of the cards in the box were ‘passed’ to AHSC
- these copied cards were fed into a AHSC computer for order processing

- the system was a big hit and was spread to 200 hospitals in a short time

Evolution of ASAP

- 1970s: The system was named ASAP (analytic systems automated purchasing)
  - updated with new electronic equipment
  - allowed for modification of order quantities
- 1977: ASAP 2: terminals connected customers to AHSC
  - could see prices, stocks
  - proposed substitutes for out of stock items
  - supported e-messages

Evolution of ASAP

- 1980 ASAP 3
  - customers can use their own product codes
  - electronic files for repetitive ordering
  - bar code readers (later)
- 1983 ASAP 4
  - linked customer computers to AHSC computers
  - automatic order file preparation
  - confirmation of order
  - updating delivery dates
- 1984 ASAP 5
  - decision support tools for customers

Supply Chain Problems and Solutions

- Problems along the supply chain from two sources
  - Uncertainties
  - Need to coordinate several activities, internal units and business partners
- A major source of supply chain uncertainties is the demand forecast. The actual demand may be influenced by several activities such as competition, prices, weather conditions, technological developments, customers' general confidence, delivery times and more.

Bullwhip Effect

- Erratic shifts in orders up and down the supply chain. It is related to properly setting inventory levels in various parts of the supply chain.

Solutions to Supply Chain Problems

- Vertical integration: integrate with the upstream part of the supply chain, typically by purchasing up-stream suppliers, in order to ensure better coordination (before 1980s).
- Using inventories: The most common solution used by companies to solve supply chain problems is building inventories as an “insurance” against supply chain uncertainties (before 1990s).

Contemporary Solutions to SC Problems

- Information sharing: sharing information along the supply chain can improve demand forecasts. Such sharing can be facilitated by EDI, extranets, and groupware technologies
- Vendor-managed inventories (VMI): allowing suppliers to monitor the inventory levels of their products in the retailers' stores and to replenish inventory when needed.

Supply Chain Management

- Discussion
  - What effects might turn up in asymmetrical relationships (e.g. one customer for many small suppliers)?

Customer Relationship Management

- **Customer Relationship Management (CRM)** is an enterprisewide effort to acquire and retain customers.
  - Includes a *one-to-one* relationship between a customer and a seller.
  - One simple idea "*Treat different customers differently*".
  - Helps keep profitable customers and maximizes lifetime revenue from them.

CRM Applications

- **Customer touch point** is a method of interaction with a customer, such as telephone, e-mail, a customer service or help desk, conventional mail, Web site and store.
- CRM systems provide applications in 3 major areas:
  - **Sales** - *sales force automation (SFA).*
  - **Marketing** – support marketing campaigns & provide opportunities for *cross-selling*, *up-selling* and *bundling*.
  - **Customer service** – can take many Web-based forms.

SFA & Marketing

- **Sales force automation (SFA)** functions provide such data as sales prospect and contact information, product information, product configurations and sales quotes.
- **Marketing**
  - **Cross-selling** refers to the marketing of complementary products to customers.
  - **Up-selling** is the marketing of higher-value products or services to new or existing customers.
  - **Bundling** is a type of cross-selling in which a combination of products is sold together at a lower price than the combined costs of the individual products.

Customer Service

- **Customer service** functions provide information and tools to make call centers, help desks and customer support staff more efficient.
- **Customer service** can take many forms and includes:
  - Technical and other information and services
  - Customized products and services

Customer Service (continued)

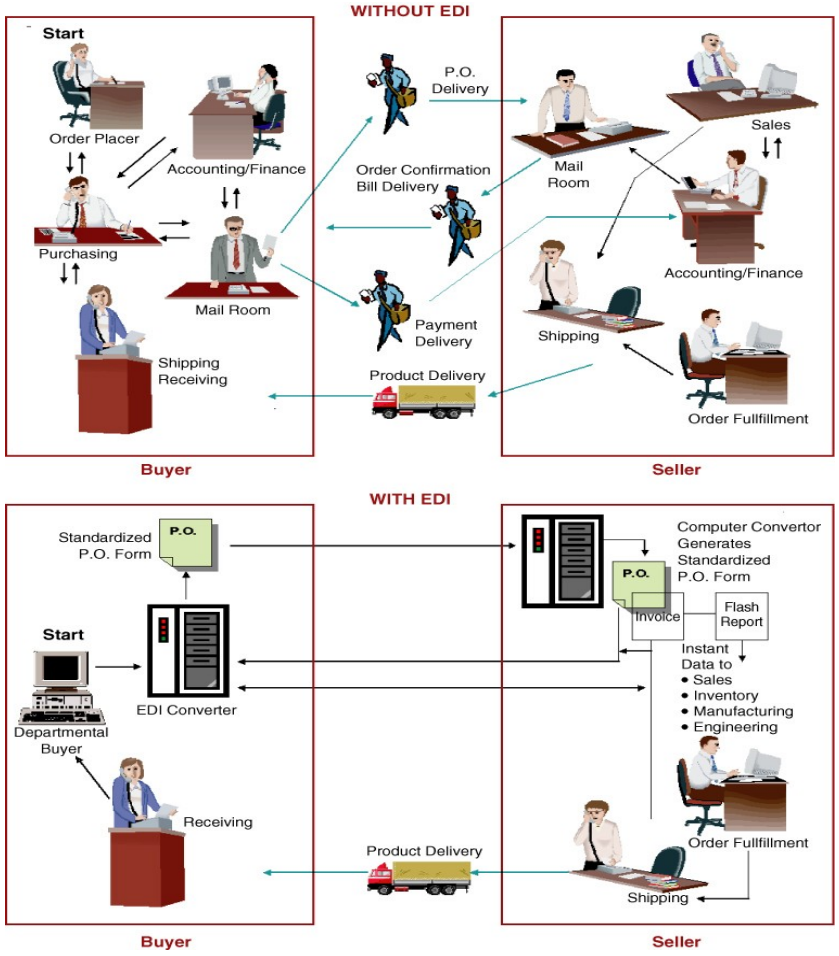
- Tracking account or order status
- Personalized Web pages
- FAQs
- E-mail and automated response
- Call centers

Customer Relationship Management

- Discussion
  - Do universities employ some kind of CRM?
  - If not, how could they introduce this?

Enabling Technology: EDI

- E-procurement
- IOS
- E-supply chain
- Extranet
- Nowadays often substituted by XML



Case Study

- Prepare the case study “Meltdown at JetBlue”, textbook p.256-258, for next class session.