MONASH University

FIT2090
BUSINESS INFORMATION SYSTEMS AND PROCESSES

Lecture 2 Enterprise Systems

CLAYTON, FACULTY OF INFORMATION TECHNOLOGY
MONASH UNIVERSITY

CENGAGE Learning

GROUP OF EIGHT AUSTRALIA

Stair & Reynolds (2016) Chapter 8: Enterprise Systems

Objectives

At the end of this lecture, students will be able to:

1. Identify the basic activities and business objectives common to all transaction processing systems
2. Describe the transaction processing systems associated with the order processing, purchasing, and accounting business functions
3. Identify the basic functions performed and the benefits derived from the implementation of an enterprise resource planning system, customer relationship management, and product lifecycle management system
4. Describe the hosted software model for enterprise systems and explain why this approach is so appealing to SMEs
5. Identify the challenges that multinational corporations face in planning, building, and operating their enterprise systems
6. Identify tips for avoiding many of the common causes for failed enterprise system implementations

Why Learn About Enterprise Systems?

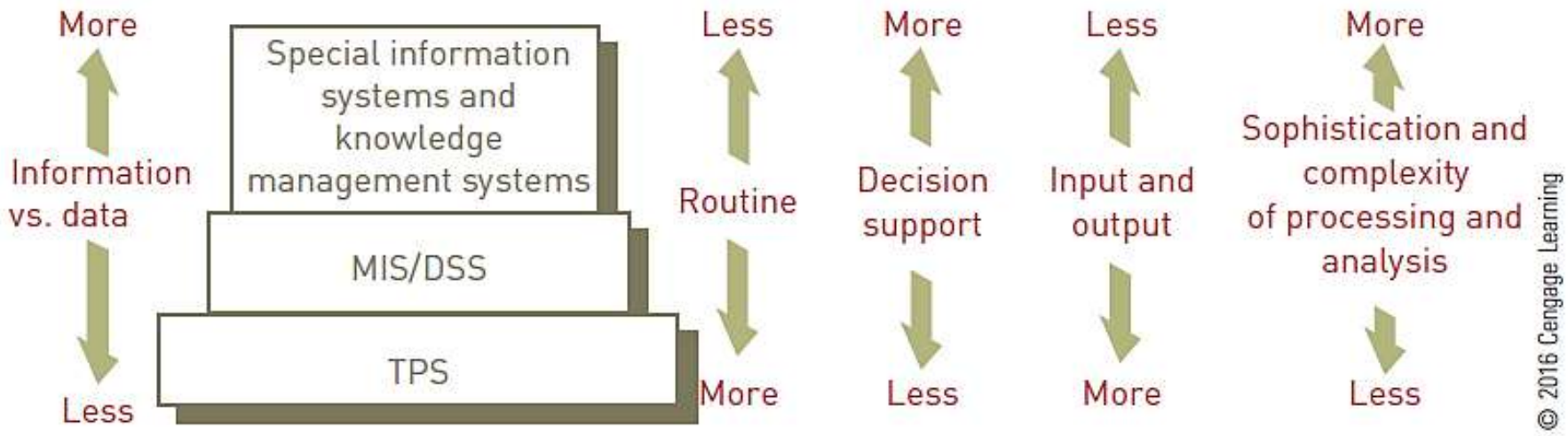
- In our service-oriented economy, outstanding customer service is a goal of virtually all companies
- Effective use of enterprise systems:
  - Raises the productivity of firms
  - Improves customer service
  - Enables better decision making

An Overview of Transaction Processing Systems

Transaction processing systems (TPSs):

- Capture and process detailed data necessary to update the organization's records about fundamental business operations
- Include order entry, inventory control, payroll, accounts payable, accounts receivable, general ledger, etc.
- Provide valuable input to MIS(Management Information Systems), DSS (Decision Support Systems), and KM (Knowledge Management) systems

TPS, MIS/DSS, and Special Information Systems in Perspective



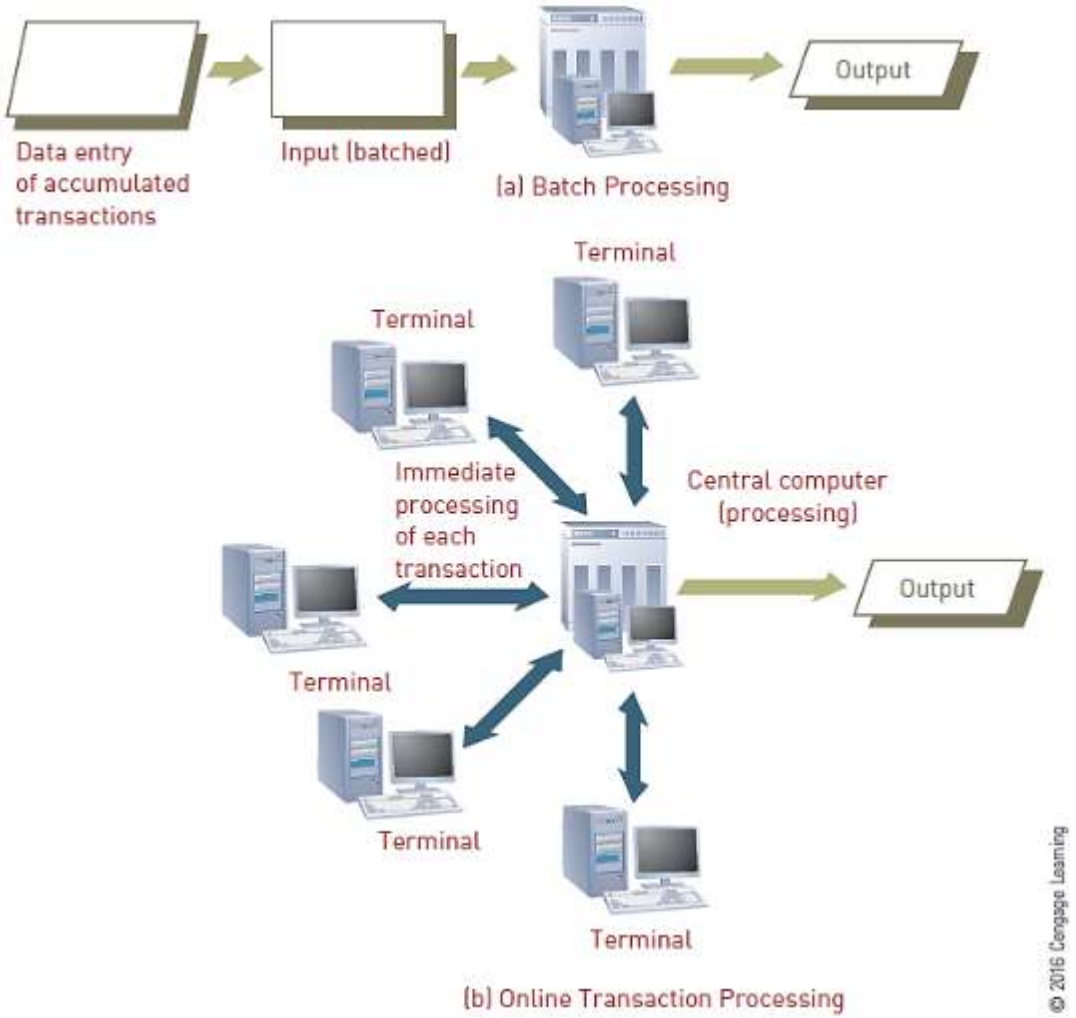
Traditional Transaction Processing Methods and Objectives

- Batch processing system
  - Business transactions are accumulated over a period of time and prepared for processing as a single unit or batch
  - Essential characteristic: the delay between an event and the processing of the related transaction to update the organization's records

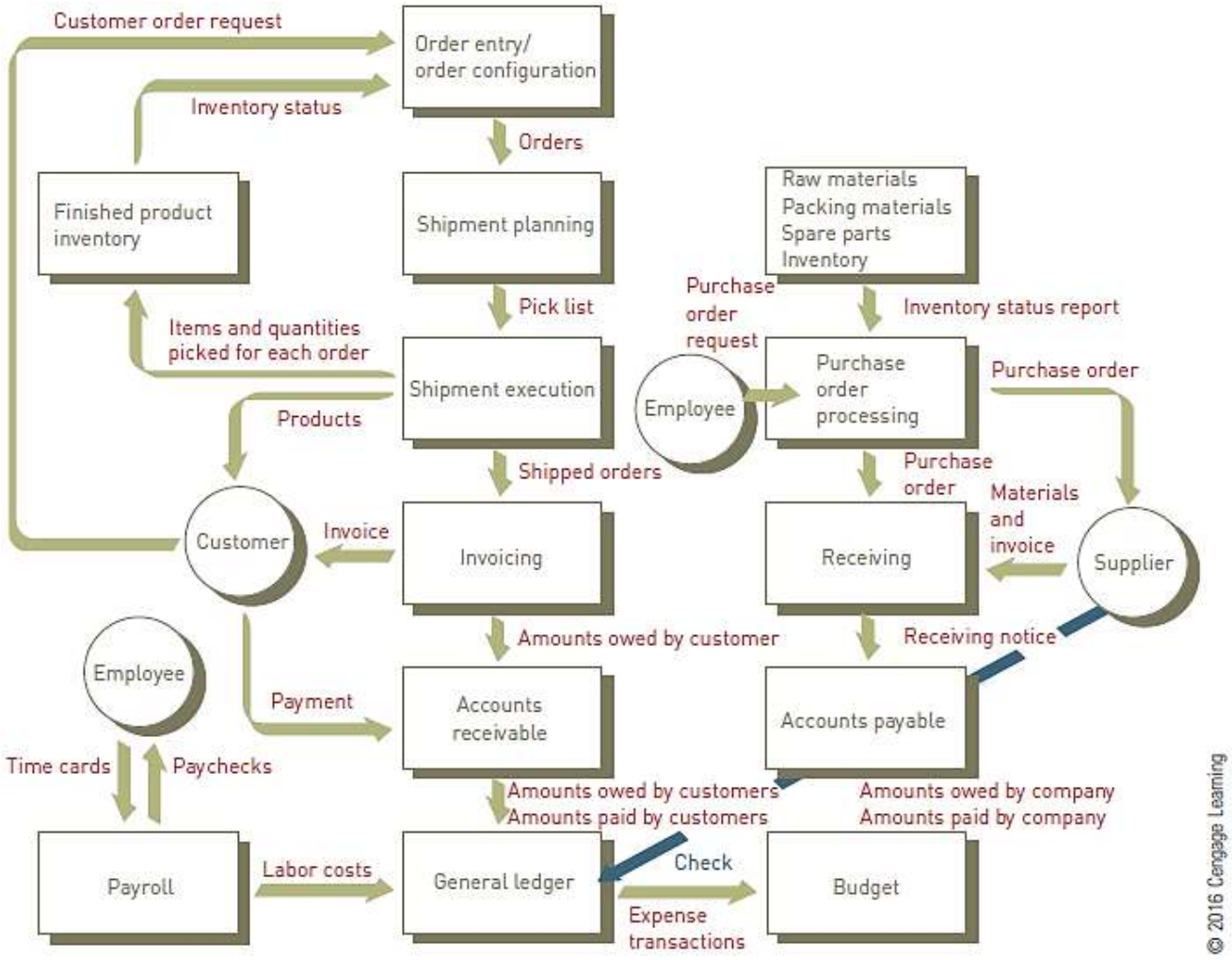
Traditional Transaction Processing Methods and Objectives (cont'd.)

- Online transaction processing (OLTP)
  - Data processing in which each transaction is processed immediately
  - At any time, the data in an online system reflects the current status
  - Many organizations find that OLTP enables them to provide faster, more efficient service

Batch Versus Online Transaction Processing



Integration of a Firm's TPS



Traditional Transaction Processing Methods and Objectives (cont'd.)

- Organizations expect their TPSs to:
  - Capture, process, and update databases
  - Ensure that the data is processed accurately and completely
  - Avoid processing fraudulent transactions
  - Produce timely user responses and reports
  - Reduce clerical and other labor requirements
  - Help improve customer service
  - Achieve competitive advantage

Expectations of TPSs

- A TPS includes:
  - Order processing systems
  - Accounting systems
  - Purchasing systems

Table 9.1 Examples of TPSs Yielding Significant Benefits

Competitive Advantage	Example
Better relationship with suppliers	Internet marketplace to allow the company to purchase products from suppliers at discounted prices
Costs dramatically reduced	Warehouse management system employing RFID technology to reduce labor hours and improve inventory accuracy
Customer loyalty increased	Customer interaction system to monitor and track each customer interaction with the company
Inventory levels reduced	Collaborative planning, forecasting, and replenishing to ensure the right amount of inventory is in stores
Superior information gathering	Order configuration system to ensure that products ordered will meet customer's objectives
Superior service provided to customers	Tracking systems that customers can access to determine shipping status

Transaction Processing Systems for Small and Medium-Size Enterprises (or SMEs)

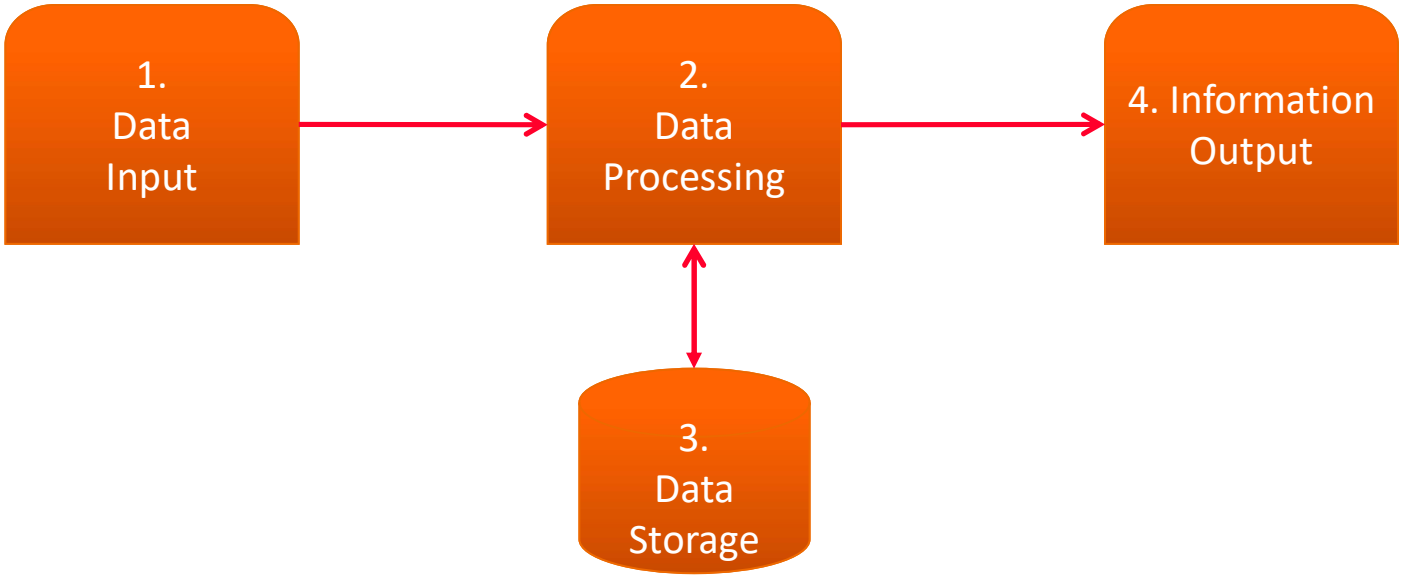
- Many software packages:
  - Provide integrated transaction processing system solutions for small and medium-size enterprises (SMEs)
  - Are easy to install and operate with a low total cost of ownership
  - Have an initial cost of a few hundred to a few thousand dollars

Table 9.2 Sample of Integrated TPS Solutions for SMEs

Vendor	Software	Type of TPS Offered	Target Customers
AccuFund	AccuFund	Financial reporting and accounting	Nonprofit, municipal, and government organizations
OpenPro	OpenPro	Complete ERP solution, including financials, supply chain management, e-commerce, customer relationship management, and retail POS system	Manufacturers, distributors, and retailers
Intuit	QuickBooks	Financial reporting and accounting	Manufacturers, professional services, contractors, nonprofits, and retailers
Sage	Timberline	Financial reporting, accounting, and operations	Contractors, real estate developers, and residential builders
Redwing	TurningPoint	Financial reporting and accounting	Professional services, banks, and retailers

A Typical Transaction Processing Cycle

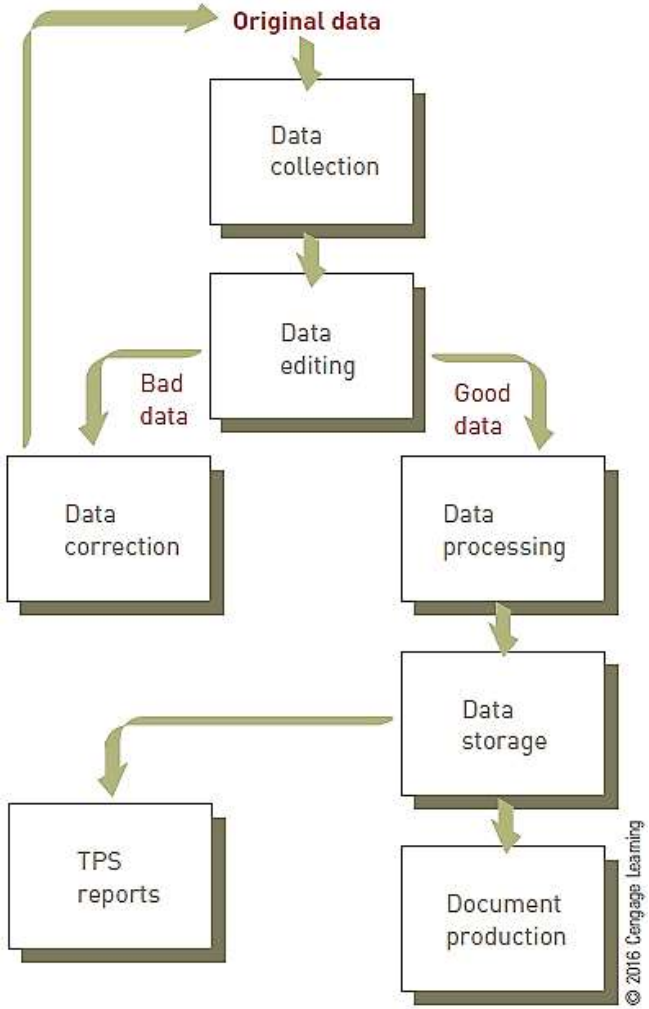
- What data should be entered and stored by an organisation, and who should have access to them?
- How should data be organised, updated, stored, accessed and retrieved?
- How can scheduled and unanticipated information needs be met?



Transaction Processing Activities

- The transaction processing cycle
  - Data collection (Data Input)
  - Data editing
  - Data correction
  - Data manipulation (Data Processing)
  - Data storage
  - Document production (Information Output)

Transaction Processing Activities (cont'd.)



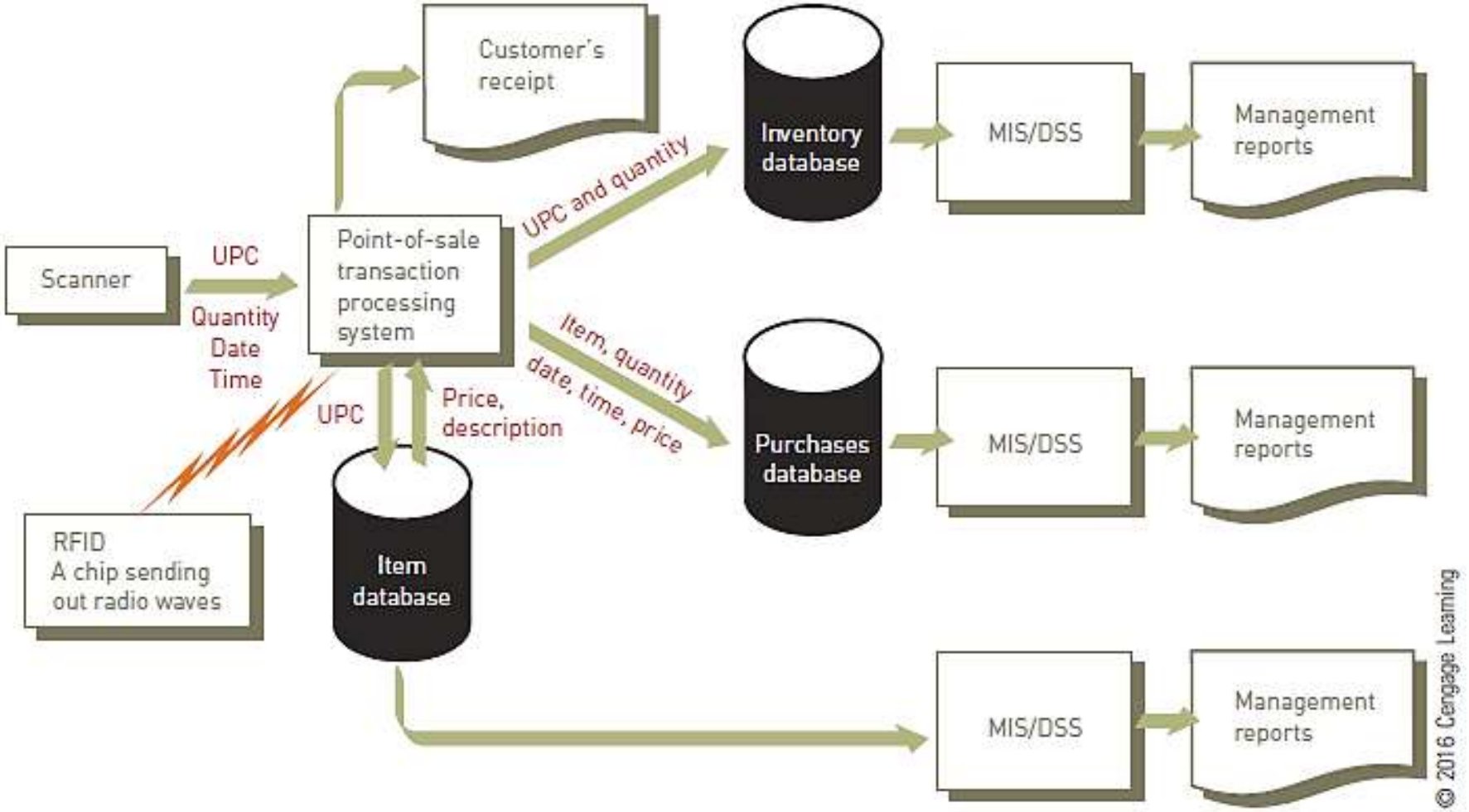
Data Collection

- Capturing and gathering all data necessary to complete the processing of transactions
- Data collection can be:
  - Manual
  - Automated via special input devices

Data Collection (cont'd.)

- Source data automation
  - Involves capturing data at its source and recording it accurately in a timely fashion with minimal manual effort and in an electronic or digital form so that it can be directly entered into the computer
  - Example: a scanner reading a UPC barcode

Point-of-Sale Transaction Processing System



Data Editing

- Checking data for validity and completeness to detect any problems
- Examples
  - Quantity and cost data must be numeric
  - Names must be alphabetic
  - Codes associated with an individual transaction are edited against a database containing valid codes

Data Correction

- Error messages must specify the problem so proper corrections can be made
- Correction involves reentering data that was not typed or scanned properly

Data Manipulation

- Performing calculations and other data transformations related to business transactions including:
  - Classifying data
  - Sorting data into categories
  - Performing calculations
  - Summarizing results
  - Storing data in the organization's database for further processing

Data Processing

Four Main Activities in data processing:

- Create new data records.
- Read, retrieve or view existing data records.
- Update existing stored data records.
- Delete data or records.

Data Storage

- Updating one or more databases with new transactions
- After being updated, this data can be further processed and manipulated by other systems

Document Production

- Generating output records, documents, and reports
  - Hard-copy paper reports
  - Displays on computer screens (soft copy)
- Results from one TPS can be inputs to another system

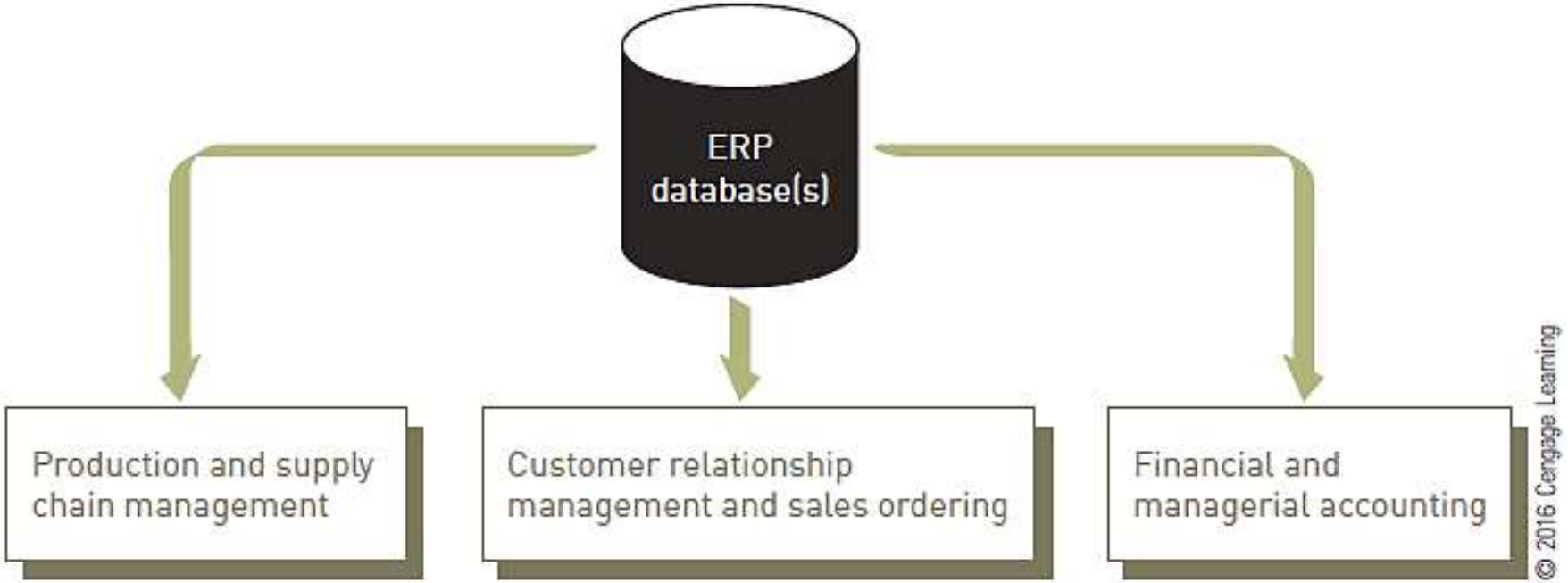
Enterprise Systems

- Central to individuals and organizations of all sizes
  - Ensure that information can be shared across all business functions and all levels of management to support the running and managing of a business
- The ultimate goal is to satisfy customers and provide significant benefits by reducing costs and improving service

Enterprise Resource Planning (ERP)

- ERP: a set of integrated programs that manage a company's vital business operations for an entire organization
- Business process: a set of coordinated and related activities that takes one or more kinds of input and creates an output of value to the customer of that process

Enterprise Resource Planning System



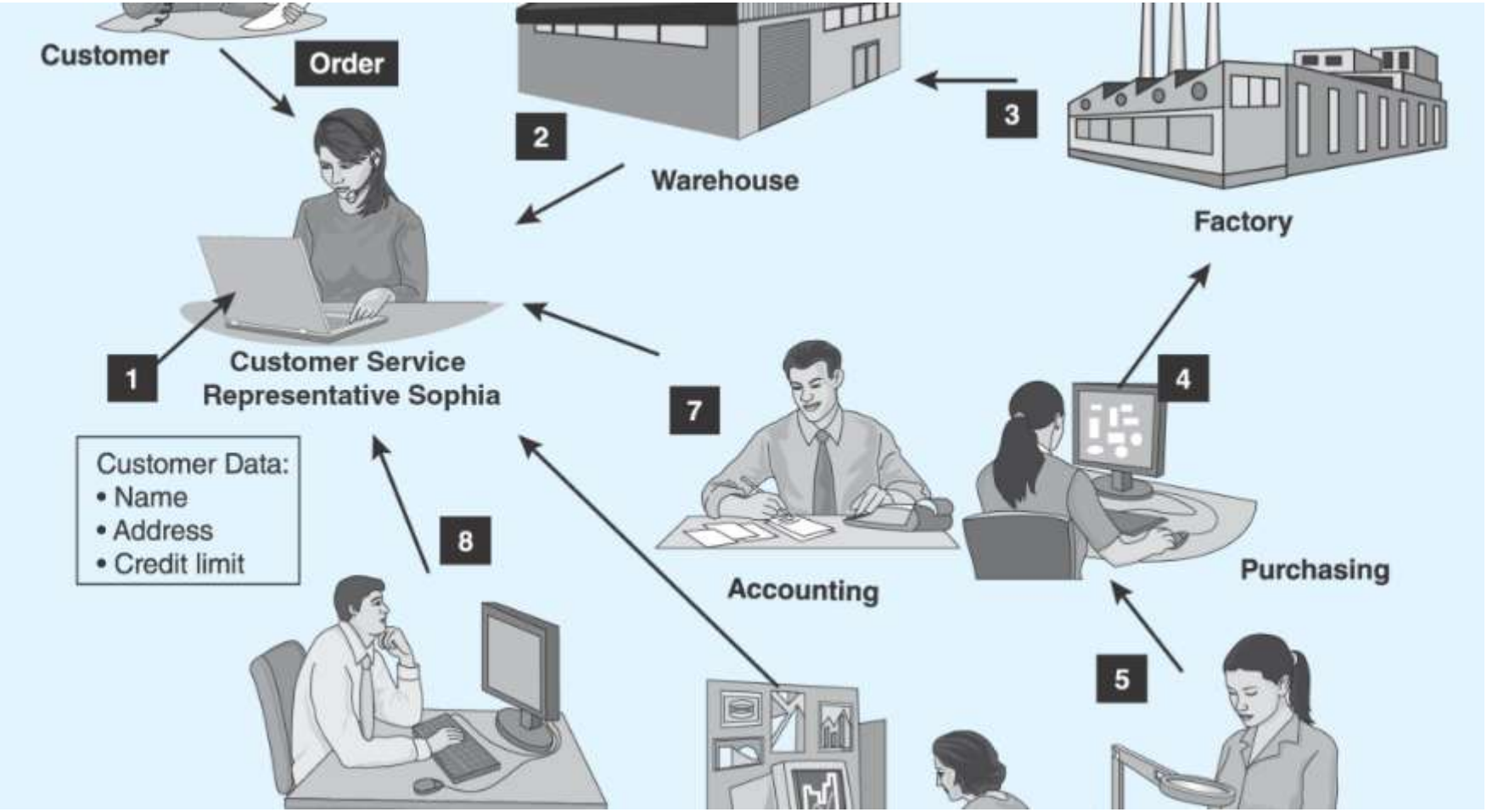
Enterprise Systems Value Chain

- The value chain is the system of activities that transform inputs into outputs valued by the customer.
- Enterprise systems facilitate value chain management.
- The goal of an organization is to add the greatest value at the lowest cost thus increasing competitive advantage.

The Value of Systems Integration

- Coordinate activities in the value chain.
- Perform this coordination by sharing data across business processes.
- The following slides describe what life would be like without integrated systems and how enterprise systems solve some of the problems.

Inefficient Customer Service

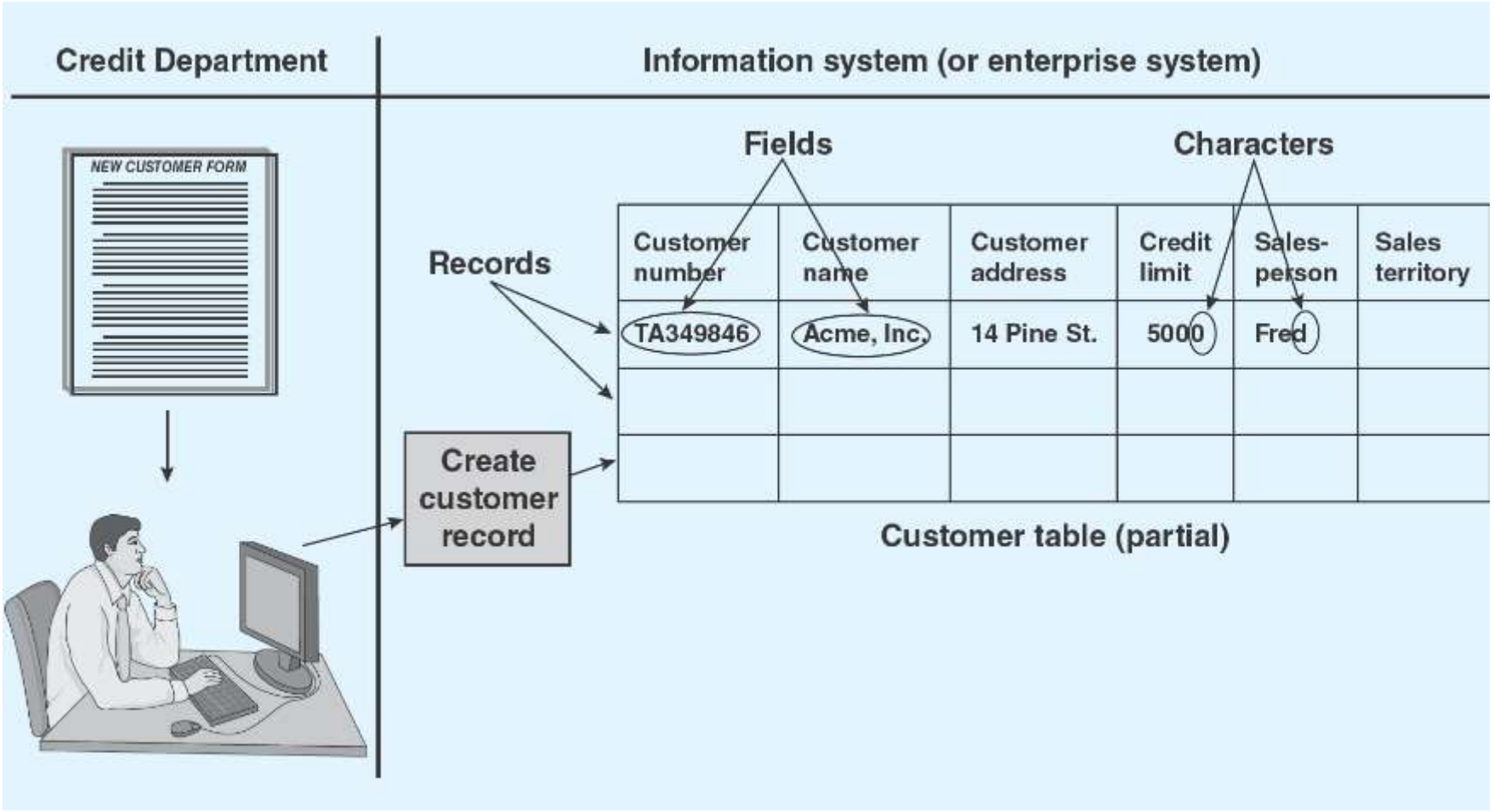


Ref: *Accounting Information Systems 9e*, Gelinas, Dull & Wheeler, pp. 44

Solution to Inefficient Customer Service

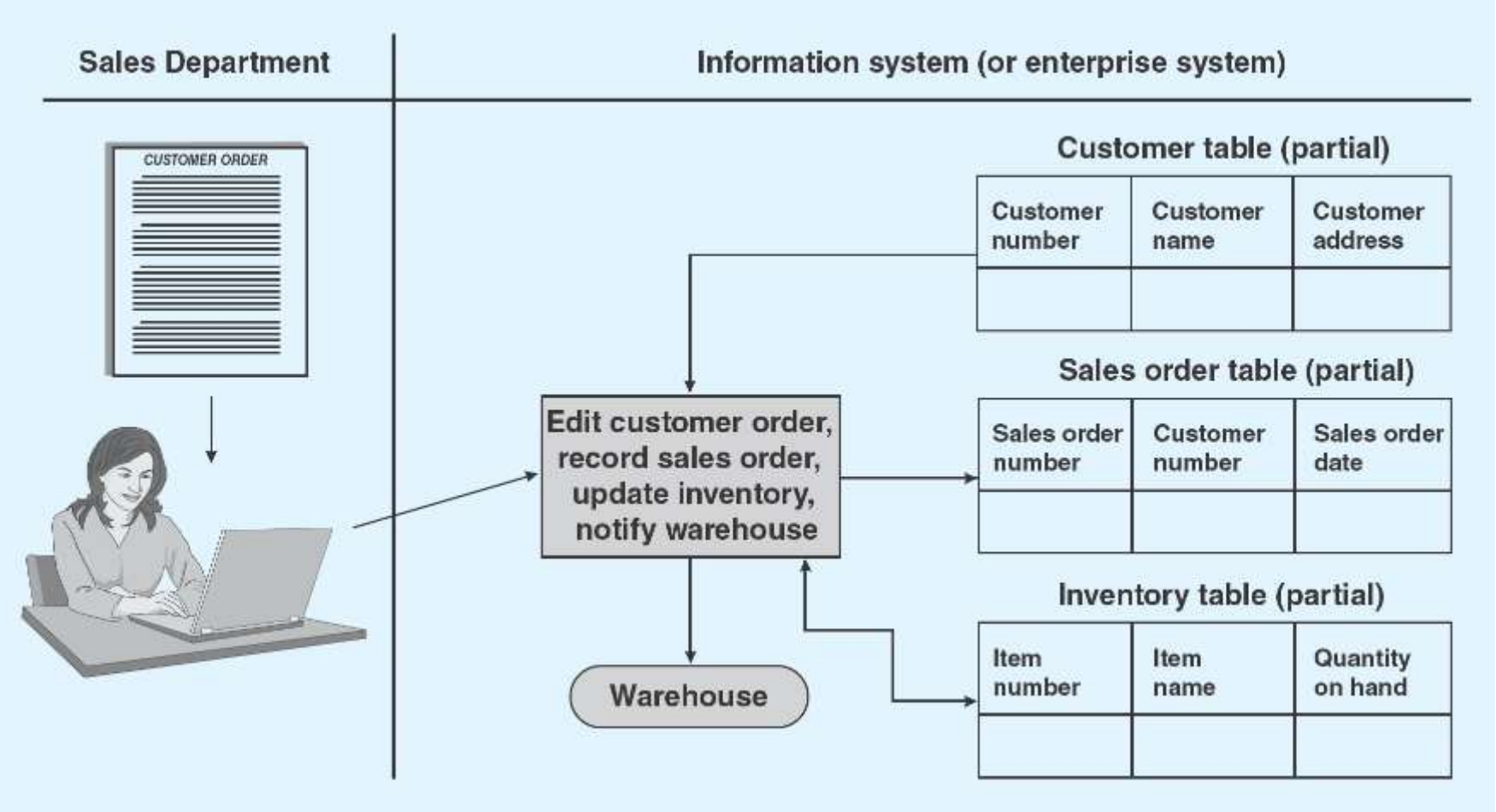
- Enterprise system establishes ATP (available to promise) by checking warehouses and scheduled manufacturing.
- Enterprise system uses the central database to automatically determine price and creditworthiness.

Data Maintenance: Create Customer Record



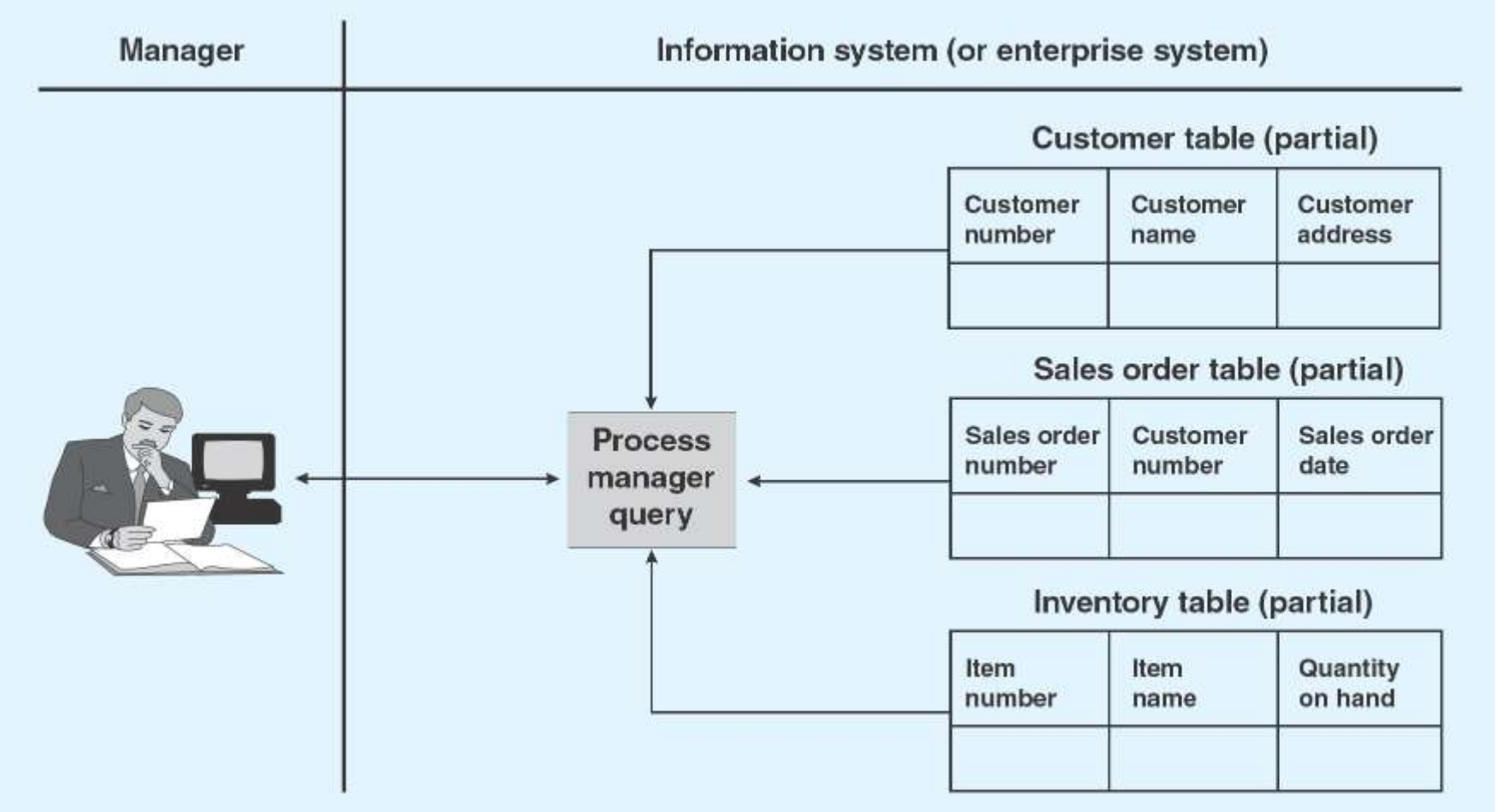
Ref: *Accounting Information Systems 9e*, Gelinas, Dull & Wheeler, pp. 48

Business Event Data Processing: Enter Customer Order



Ref: *Accounting Information Systems 9e*, Gelinas, Dull & Wheeler, pp. 49

Using Stored Data for Decision Making



Ref: *Accounting Information Systems 9e*, Gelinas, Dull & Wheeler, pp. 50

An Overview of Enterprise Resource Planning

- ERP systems evolved from materials requirement planning systems (MRP) developed in the 1970s
- Large organizations were the first to take on the challenge of implementing ERP

Leading ERP Systems

- ERP vendors classified by customer type

Category	Type of Customer	Annual Revenues
Tier I	Large multinational firms with multiple geographic locations	> $1 billion
Tier II	Medium-sized firms operating out of one or more locations	$50 million to $1 billion
Tier III	Smaller firms that operate out of a single location	$10 to $50 million

Leading ERP Systems (cont'd.)

- Many large companies employed ERP on large mainframe computers in the 2000s
- ERP software vendors created new solutions for smaller companies
- Cloud-based solutions are available
  - Examples: Plex and NetSuite
- Compiere offers an open-source ERP system

ERP Systems: Customization

- Vendor's ERP software may require customization to:
  - Integrate other business systems
  - Add data fields or change field sizes from those in the standard system
  - To meet regulatory requirements

Supply Chain Management (SCM)

- A system that includes planning, executing, and controlling all activities involved in:
  - Sourcing and procurement of raw materials
  - Converting raw materials to finished products
  - Warehousing and delivering finished product to customers

Supply Chain Management (cont'd.)

- Process for developing a production plan
  - Sales forecasting
  - Sales and operations plan (S&OP)
  - Demand management
  - Detailed scheduling
  - Materials requirement planning (MRP)
  - Purchasing
  - Production
  - Sales ordering

Supply Chain Management: ERP Accounting

- ERP systems do not work directly with production machines
  - Data must be passed to the ERP accounting modules to keep an accurate count of finished product inventory
- Retailers as well as manufacturers use demand forecasting to:
  - Match production to consumer demand
  - Allocate products to stores

Customer Relationship Management

- Customer relationship management (CRM) system
  - Helps a company manage all aspects of customer encounters, including marketing, sales, distribution, accounting, and customer service
- The goal of CRM is to understand and anticipate the needs of current and potential customers

Customer Relationship Management (cont'd.)

- Used primarily in sales, marketing, and service organizations:
  - To capture and view data about customers and to improve communications
- CRM software:
  - Automates and integrates the functions of sales, marketing, and service in an organization

Customer Relationship Management System

Key Features of a CRM System

- Contact management
- Sales management
- Customer support
- Marketing automation
- Analysis
- Social networking
- Access by smartphones
- Import contact data

Table 9.3 Highest-Rated CRM Systems, 2014

Rank	Vendor	Select Customers	Pricing Starts at
1	Salesforce Sales Cloud	Dell Dr. Pepper Snapple	$5 per user/month
2	OnContact CRM 7	Prudential Carfax	$50 per user/month
3	Sage Software CRM	Panasonic Lockheed Martin	$39 per user/month
4	Prophet CRM	AT&T Century 21	$24 per user/month

Product Lifecycle Management (PLM)

- An enterprise business strategy that creates a common repository of product information and processes
  - Supports the collaborative creation, management, dissemination, and use of product and packaging definition information

PLM Software

- Provides a means for managing the data and processes associated with the various phases of the lifecycle of a product
- The scope of PLM software may include computer-aided design, computer-aided engineering, and computer-aided manufacturing

Scope of PLM Software

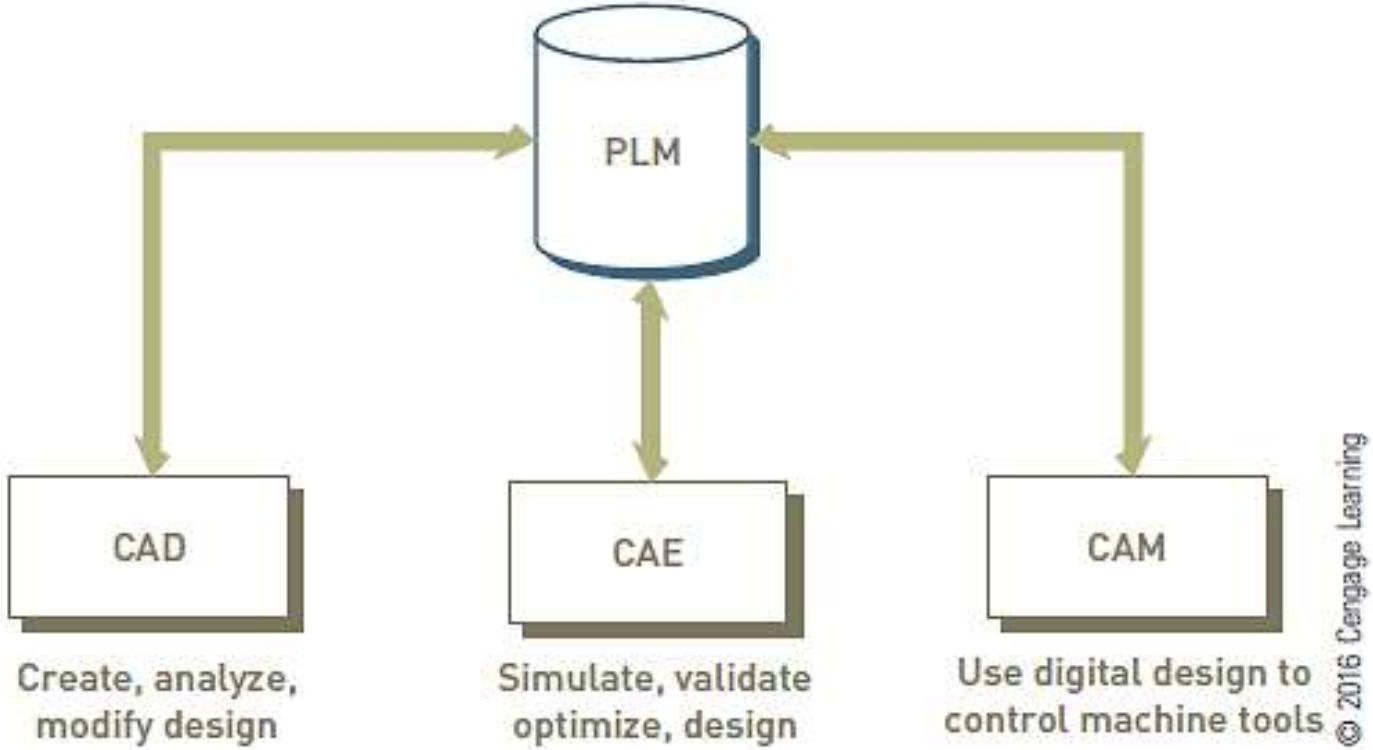
PLM Software: CAD, CAE and CAM Software

- Computer-aided design (CAD):
  - The use of software to assist in the creation, analysis, and modification of the design of a component or product
- Computer-aided engineering (CAE):
  - The use of software to analyze the robustness and performance of components and assemblies

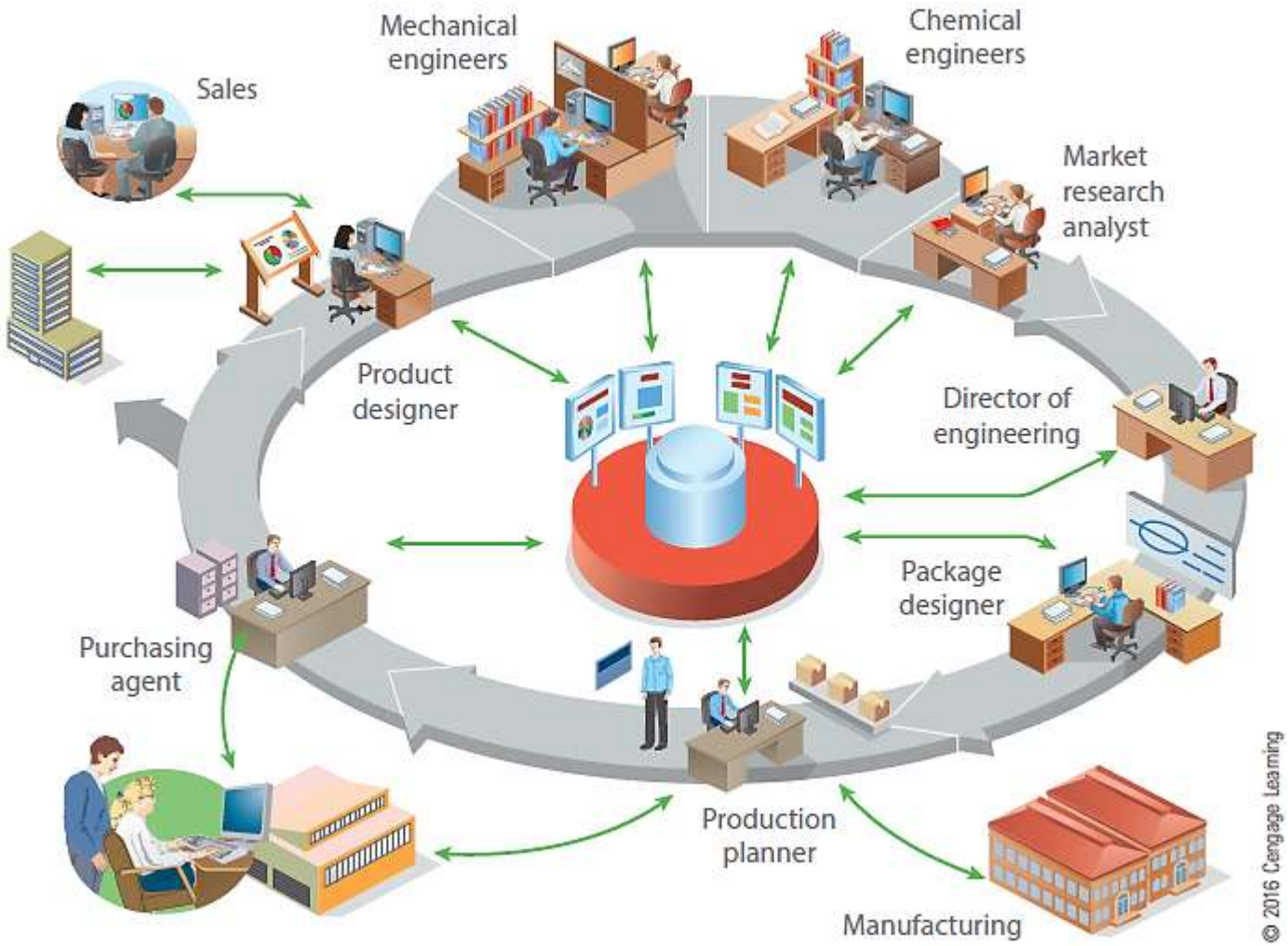
PLM Software: CAD, CAE and CAM Software (cont'd.)

- Computer-aided manufacturing (CAM)
  - The use of software to control machine tools and related machinery in the manufacture of components and products

CAD, CAE, and CAM Software



PLM Business Strategy



PLM Software for Two Broad Categories of Manufacturing

- Discrete manufacturing
  - The production of distinct items e.g., autos, airplanes, furniture, or toys that can be decomposed into their basic components
- Process manufacturing
  - The production of products that are the result of a chemical process, e.g., gasoline and pharmaceutical drugs that cannot be easily decomposed into its basic components

Table 9.5 Benefits of a PLM System

Benefit	How Achieved
Reduce time to market	By connecting design, research and development, procurement, manufacturing, and customer service seamlessly through a flexible collaboration environment By improving collaboration among the organization and its suppliers, contract manufacturers, and OEMs
Reduce costs	By reducing prototyping costs through the use of software simulation By reducing scrap and rework through improved processes By reducing the number of product components through standardization
Ensure regulatory compliance	By providing a secure repository, tracking and audit trails, change and document management controls, workflow and communications, and improved security

Advantages of ERP

- Improved access to quality data for operational decision making
- Elimination of inefficient or outdated systems
- Improvement of work processes
- Technology standardization

Pros of Enterprise Systems

- Single database
- Process orientation (versus function orientation)
- Standardisation of business processes and data, easier to understand across the organisation
- Faster and more efficient business processes
- Timely information
- Better financial management (partly due to integration)
- Productivity improvements
- Catalyst for re-engineering old, inefficient business processes
- Etc.

Pros of ERP Packages

- One package across many functions (if one ERP)
- "Best practices"
- Modular structure (buy what you need)
- No development needed (unless modifications are required)
- Configurable
- Reduced errors (e.g., business rules, enter data once)

Cons of Enterprise Systems and ERP Packages

Cons of Enterprise Systems
• Centralized control versus decentralized empowerment • Inability to support traditional business processes that may be best practices for that organization • Loss of flexibility in rapidly adapting to desired new business processes in the post-implementation period • Increased complexity of maintaining security, control, and access permissions for specific information embedded in central database • The rigidity of "standardization" can impede creative thinking related to ongoing business process improvements
Cons of ERP Packages
• Complex and inflexible • Best practices are shared by all who buy • Difficult to configure • Long implementation • Best of breed might be better (than single ERP package) • Can't meet all needs (i.e., developed for many user types)

Overcoming Challenges in Implementing ERP Systems

- Cost and disruption of upgrades for systems that must integrate with the ERP system
- Cost and long implementation time
- Difficulty in implementing change
- Management of software customization
- User frustration with the new system

Overcoming Challenges in Implementing ERP Systems (cont'd.)

- Tips for avoiding a failed implementation
  - Assign a full-time executive to manage the project
  - Appoint an experienced, independent resource to provide project over- sight and to verify and validate system performance
  - Plan to spend considerable time and money training people

Tips for Avoiding a Failed Implementation (cont'd.)

- Define metrics to assess project progress and to identify project-related risks
- Keep the scope of the project well defined and contained to essential business processes
- Be wary of modifying the enterprise system software to conform to your firm's business practices

Hosted Software Model for Enterprise Software

- Many business application software vendors are pushing the use of the hosted software model for SMEs
- Using the hosted software model enables SMEs to:
  - Experiment with powerful software capabilities without making a major financial investment
  - Avoid employing a full-time IT person to maintain key business applications

Table 9.7 Advantages and Disadvantages of Hosted Software Model

Advantages	Disadvantages
Decreased total cost of ownership	Potential availability and reliability issues
Faster system start-up	Potential data security issues
Lower implementation risk	Potential problems integrating the hosted products of different vendors
Management of systems outsourced to experts	Savings anticipated from outsourcing may be offset by increased effort to manage vendor

Summary

- Transaction processing systems (TPSs) are at the heart of most information systems in businesses today
- The methods of TPSs include batch and online processing
- Basic activities of TPSs
  - Data collection, data editing, data correction, data processing, data storage, and document production
- Enterprise resource planning (ERP) software supports the efficient operation of business processes
- Organizations are implementing CRM systems to manage all aspects of customer encounters
- Manufacturing organizations are implementing product lifecycle management (PLM) software to manage the data and processes associated with the various phases of the product lifecycle
- Business application software vendors are experimenting with the hosted software model to see if the approach meets customer needs