Accounting Information Systems 14th edition Romney Solutions Manual

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CHAPTER 2

OVERVIEW OF TRANSACTION PROCESSING AND ENTERPRISE RESOURCE PLANNING SYSTEMS

SUGGESTED ANSWERS TO DISCUSSION QUESTIONS

2.1 Table 2-1 lists some of the documents used in the revenue, expenditure, and human resources cycle. What kinds of input or output documents or forms would you find in the production (also referred to as the conversion cycle)?

Students will not know the names of the documents but they should be able to identify the tasks about which information needs to be gathered. Here are some of those tasks

- Requests for items to be produced
- Documents to plan production
- Schedule of items to be produced
- List of items produced, including quantity and quality
- Form to allocate costs to products
- Form to collect time spent on production jobs
- Form requesting raw materials for production process
- Documents showing how much raw materials are on hand
- Documents showing how much raw materials went into production
- List of production processes
- List of items needed to produce each product
- Documents to control movement of goods from one location to another

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2.2 With respect to the data processing cycle, explain the phrase "garbage in, garbage out." How can you prevent this from happening?

When garbage, defined as errors, is allowed into a system that error is processed and the resultant data stored. The stored data at some point will become output. Thus, the phrase garbage in, garbage out. Data errors are even more problematic in ERP systems because the error can affect many more applications than an error in a non-integrated database.

Companies go to great lengths to make sure that errors are not entered into a system. To prevent data input errors:

- Data captured on source documents and keyed into the system are edited by the computer to detect and correct errors and critical data is sometimes double keyed.
- Companies use turnaround documents to avoid the keying process.
- Companies use source data automation devices to capture data electronically to avoid the keying and some of the editing process.
- Well-designed documents and screens improve accuracy and completeness by providing instructions or prompts about what data to collect, grouping logically related pieces of information close together, using check off boxes or pull-down menus to present the available options, and using appropriate shading and borders to clearly separate data items.
- Data input screens are preformatted to list all the data the user needs to enter.
- Prenumbered source documents are used or the system automatically assigns a sequential number to each new transaction. This simplifies verifying that all transactions have been recorded and that none of the documents has been misplaced.
- The system is programmed to make sure company policies are followed, such as approving or verifying a transaction. For example, the system can be programmed to check a customer's credit limit and payment history, as well as inventory status, before confirming a sale to a customer.

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2.3 What kinds of documents are most likely to be turnaround documents? Do an internet search to find the answer and to find example turnaround documents.

Documents that are commonly used as turnaround documents include the following:

- Utility bills
- Meter cards for collecting readings from gas meters, photocopiers, water meters etc
- Subscription renewal notices
- Inventory stock cards
- Invoices
- Checks (banks encode account info on the bottom of checks)
- Annual emissions inventory forms (http://www.deq.state.ok.us/aqdnew/Emissions/TurnAroundDocs.htm)

Students will find many other turnaround documents.

Here are some URLs for turnaround document definitions and examples:
http://en.wikipedia.org/wiki/Turnaround_document
http://www.pcmag.com/encyclopedia_term/0,2542,t=turnaround+document&i=53248,00.asp
http://www.answers.com/topic/turnaround-document-1

Here are some turnaround document images (1 long URL):
http://images.google.com/images?q=turnaround+document&oe=utf-8&rls=org.mozilla:en-US:official&client=firefox-a&um=1&ie=UTF-8&ei=N7yBSpbAF4KiswO39JnwCA&sa=X&oi=image_result_group&ct=title&resnum=4

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2.4 The data processing cycle in Figure 2-1 is an example of a basic process found throughout nature. Relate the basic input/process/store/output model to the functions of the human body.

There are a number of ways to relate the input/process/store/output model to the human body. Here are a few of them

- Brain. We read, see, hear, and feel things. We process that input in order to understand what it is and how it relates to us. We store that data in our brains and then process it again in order to produce solve problems, make decisions, etc., which represent output.
- Stomach. We take food in as input. It is processed to produce energy to fuel all bodily functions. If we eat more food than the body needs at any one time it is stored as fat. The output is walking, talking, thinking – all functions fueled by the energy produced. Human waste is also an output of that process.

Students will come up with other examples of how the input/process/store/output model applies to the human body

2.5 Some individuals argue that accountants should focus on producing financial statements and leave the design and production of managerial reports to information systems specialists. What are the advantages and disadvantages of following this advice? To what extent should accountants be involved in producing reports that include more than just financial measures of performance? Why?

There are no advantages to accountants focusing only on financial information. Both the accountant and the organization would suffer if this occurred. Moreover, it would be very costly to have two systems rather than one that captures and processes operational facts at the same time as it captures and reports financial facts.

The main disadvantage of this is that accountants would ignore much relevant information about the organization's activities. To the extent that such nonfinancial information (e.g., market share, customer satisfaction, measures of quality, etc.) is important to management, the value of the accounting function would decline. Moreover, accountants have been trained in how to design systems to maximize the reliability of the information produced. If relevant information is not produced by the AIS, there is danger that the information may be unreliable because the people responsible for its production have not been trained in, or adequately aware of, the potential threats to reliability and the best measures for dealing with those threats.

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SUGGESTED ANSWERS TO THE PROBLEMS

2.1 The chart of accounts must be tailored to an organization's specific needs. Discuss how the chart of accounts for the following organizations would differ from the one presented for S&S in Table 2-4.

Some of the changes in the chart of accounts for each type of entity include the following:

a. University

- No equity or summary drawing accounts. Instead, have a fund balances section for each type of fund.
- Several types of funds, with a separate chart of accounts for each. The current fund is used for operating expenses, but not capital expenditures. Loan funds are used to account for scholarships and loans. Endowment funds are used to account for resources obtained from specific donors, generally with the objective that principal be preserved and that income be used for a specific purpose. Plant funds are used for major capital expenditures. Most fund categories would be further divided into restricted and unrestricted categories.
- Unlikely to have Notes Receivable, but may have Accounts Receivable for students who pay tuition in installment payments.
- Tuition and fees would be one source of revenue. Others include gifts, investment income, sales of services, and, for public universities, state appropriations.
- Student loans are an asset; student deposits are a liability.

b. Bank

- Loans to customers would be an asset, some current others noncurrent, depending upon the length of the loan.
- No inventory
- Customer accounts would be liabilities.
- Classification of revenue would be among loans, investments, service charges, etc.
- No cost of goods sold.

c. Government Unit

- No equity or summary drawing accounts. Instead, have fund balances.
- Balance sheet shows two major categories: (1) assets and (2) liabilities and fund equity.
- Separate chart of accounts for each fund (general fund, special revenue fund, capital projects fund, and debt service fund).
- Revenue and expenditure accounts would be grouped by purpose (e.g., police, highways, sanitation, education, etc.).

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- Encumbrance accounts
- Revenues would include taxes, licenses and permits, fines, and charges for specific services.
- Taxes receivable as a separate category due to importance.
- No cost of goods sold.

d. Manufacturing Company
- Several types of inventory accounts (raw materials, work-in-process, and finished goods).
- Additional digits to code revenues and expenses by products and to code assets/liabilities by divisions.

e. Expansion of S&S
- Additional digits to code:
  - Revenues and expenses by products and by stores
  - Assets/liabilities by stores.

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2.2 Design a chart of accounts for SDC. Explain how you structured the chart of accounts to meet the company's needs and operating characteristics. Keep total account code length to a minimum, while still satisfying all of Mace's desires.

(Adapted from the CMA Exam)

A six-digit code (represented by letters ABCDEF) is sufficient to meet SDC's needs:

A This digit identifies the 4 divisions plus the corporate office

B This digit represents major account types (asset, liability, equity, revenue, expense).

C This digit represents the major classification within account type:

- For balance sheet accounts, this represents specific sub-categories (current assets, plant and equipment, etc.), as only six categories are needed.
- For expense and revenue accounts, this digit represents the product group, as again there are only five products plus general costs.

D This digit represents specific accounts or cost centers:

- For balance sheet accounts, this is the control account; one digit is adequate because the problem says no more than 10 categories.
- For expense accounts, this is the cost center; one digit is adequate because the problem indicates no more than 6 cost centers.

EF These two digits represent the subsidiary accounts and natural expense categories:

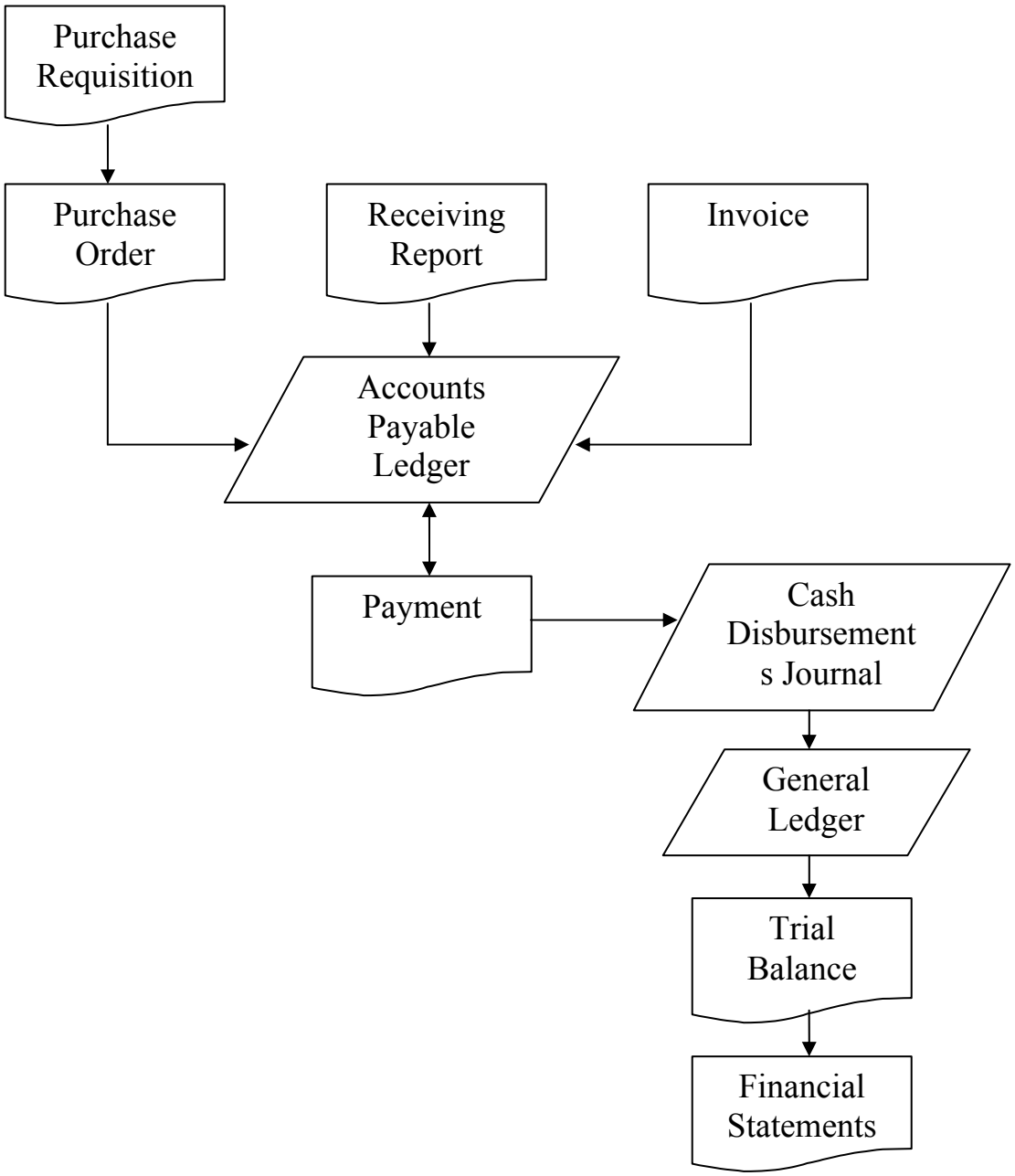
- For expense accounts, these represent the 56 natural expense categories and variances for each cost center.
- For the balance sheet, these two digits accommodate up to 100 subsidiary accounts.

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2.3 An audit trail enables a person to trace a source document to its ultimate effect on the financial statements or work back from amounts in the financial statements to source documents. Describe in detail the audit trail for the following:

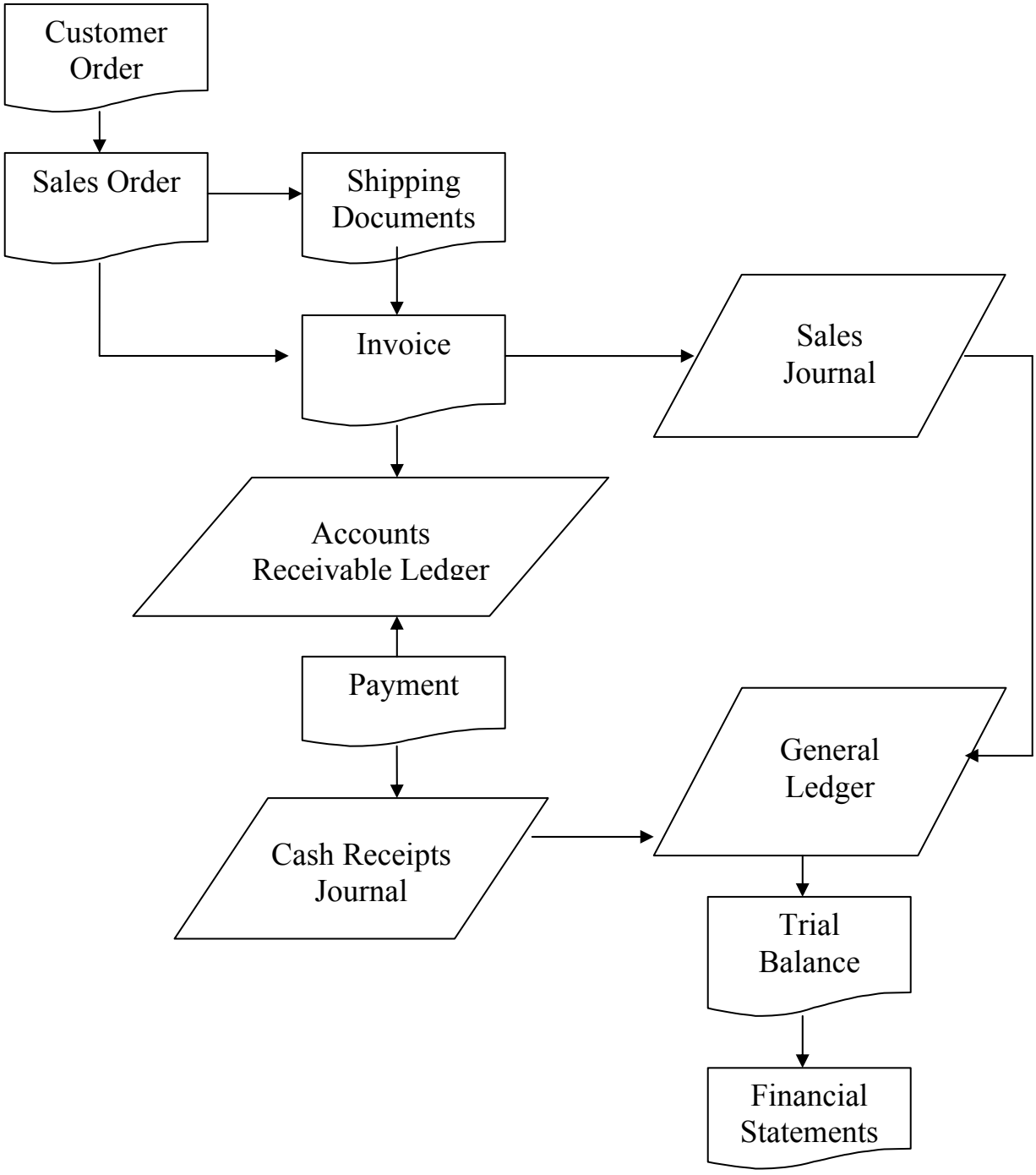
a. The audit trail for inventory purchases includes linking purchase requisitions, purchase orders, and receiving reports to vendor invoices for payment. All these documents would be linked to the check or EFT transaction used to pay for an invoice and recorded in the Cash Disbursements Journal. In addition, these documents would all be linked to the journal entry made to record that purchase. There would be a general ledger account number at the bottom of each column in the journal. The journal reference would appear in the General Ledger, Inventory Ledger, and Accounts Payable ledger.



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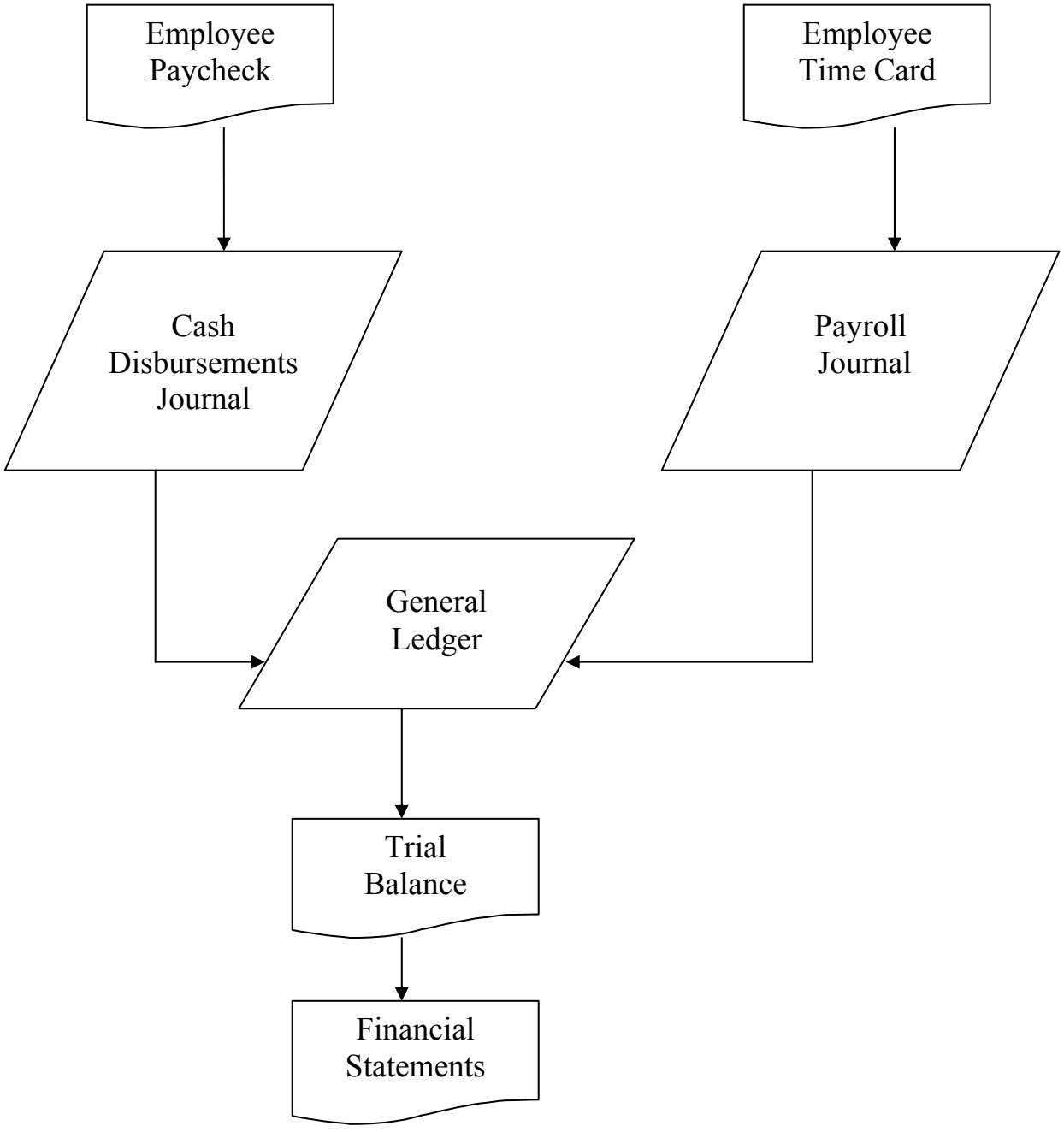
b. The audit trail for the sale of inventory links the customer order, sales order, and shipping document to the sales invoice. These documents are linked to the journal entry recording the sale of that merchandise. The invoice would also be linked to the cash received from the customer and to the journal entry to record that receipt.



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c. The audit trail for employee payroll links records of employee activity (time cards, time sheets, etc.) to paychecks and to the journal entry to record payment of payroll. In a manufacturing company, there would also be links to the job-time tickets used to allocate labor costs to specific products or processes.



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2.4 Your nursery sells various types and sizes of trees, bedding plants, vegetable plants, and shrubs. It also sells fertilizer and potting soil. Design a coding scheme for your nursery.

Grading depends upon the instructor's judgment about the quality of the coding scheme. The coding scheme should be either a group or block coding. In addition, the student's solutions should provide sufficient detail in order to determine whether the solution represents a group or block coding scheme.

2.5 Match the following terms with their definitions

a. 10
b. 23
c. 7
d. 16
e. 1
f. 13
g. 26
h. 21
i. 2
j. 25
k. 19
l. 22
m. 4
n. 8
o. 17
p. 3
q. 11
r. 9
s. 6
t. 24
u. 5
v. 12
w. 14
x. 18
y. 20
z. 15

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2.6 For each of the following scenarios identify which data processing method (batch or online, real-time) would be the most appropriate.

Some students will respond that all can and ought to be done with online-real time processing. While all can certainly be done that way, batch processing does have its advantages (cheaper, more efficient, etc.). In making the decision between batch and online-real time processing, designers must consider the need for current and accurate data. Batch processing is often used for data that does not need frequent updating and naturally occurs or is processed at fixed times. For example, while employee check in and checkout times may be gathered in real time, payroll is usually only processed at a fixed interval such as weekly, biweekly, or monthly.

a. online-real time
b. online-real time
c. batch
d. online-real time
e. batch
f. batch
g. batch
h. on-line real time

2.7 After viewing the Web sites, and based on your reading of the chapter, write a 2 page paper that describes how an ERP can connect and integrate the revenue, expenditure, human resources/payroll, and financing cycles of a business.

Student solutions will vary depending on the demonstrations they observe. However, the demonstrations should give the students a more concrete and visual understanding of what an ERP system is and does. Student solutions should at least discuss how an ERP could integrate all of the various cycle activities of a business into one integrated system.

2.8 Identify whether the following transactions belong in a master file or a transaction file.

a. Update customer address change – Master file
b. Update unit pricing information – Master file
c. Record daily sales – Transaction file
d. Record payroll checks – Transaction file
e. Change employee pay rates – Master file
f. Record production run variances – Transaction file
g. Record Sales Commissions – Transaction file
h. Change employee office location – Master file
i. Update accounts payable balance – Master file
j. Change customer credit limit – Master file
k. Change vendor payment discount terms – Master file
l. Record purchases – Transaction file

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2.9 You were hired to assist Ashton Fleming in designing an accounting system for S&S. Ashton has developed a list of the journals, ledgers, reports, and documents that he thinks S&S needs (see Table 2-6). He asks you to complete the following tasks:

a. Specify what data you think should be collected on each of the following four documents: sales invoice, purchase order, receiving report, employee time card
b. Design a report to manage inventory.
c. Design a report to assist in managing credit sales and cash collections.
d. Visit a local office supply store and identify what types of journals, ledgers, and blank forms for various documents (sales invoices, purchase orders, etc.) are available. Describe how easily they could be adapted to meet S&S's needs.

No single answer exists with this case. Indeed, solutions will vary depending upon student ingenuity and creativity. Student answers can be compared to examples of these documents found in chapters 10 and 11.

a. A sample invoice is presented in the Revenue Cycle chapter. A sample purchase order is presented in the Expenditure Cycle chapter. A sample receiving report also appears in the Expenditure Cycle chapter. Although student designs will vary, each document should contain the following data items:

<u>Sales Invoice</u>

Customer name and address	Product code or number
Customer account number	Product description
Customer order number	Quantity ordered
Salesperson code	Quantity shipped
Shipping Address	Unit price
Shipper and date shipped	Extended price
Terms of sale	Taxes, if applicable
Total Amount due	

<u>Purchase Order</u>

Ship to address	Item numbers ordered
Bill to address	Payment terms
Purchasing agent number	Shipping instructions
Quantity of parts ordered	Supplier name or number
Prices of parts ordered	Date of purchase
Taxes, if any	Total amount of purchase

<u>Receiving Report</u>

Vendor name	Vendor number
Vendor address	Date received
Shipper	Receiving clerk number
Quantity received	Part number received
Description/quality remarks	Purchase order number
Inspected by	

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Employee Time Card

Employee name	Total regular hours
Employee number	Time in/ Time out
Pay period	Total overtime hours
Department number	Approved by
Employee signature	

b. The report to manage inventory should contain the following information:

- Preferred vendor
- Product number
- Description
- Reorder point
- Quantity on Hand
- Quantity Available
- Vendor performance history
- Quantity on order
- Lead time

c. The report to manage credit sales and cash collections should include:

- Credit sales per period
- Cash collections per period
- Aging of accounts receivable
- Customers by geographic region
- Uncollectible accounts per period

d. The answers to this will vary depending upon the types of documents carried in the office supplies stores visited by the students.

A fruitful topic for class discussion, or a possible additional case assignment, is to compare the design of paper documents to the data entry screen layouts used in various popular accounting packages.

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2.10 Correct answers bolded

1. Which of the following statements is (are) true?
    a. **Turnaround documents are company output sent to an external party and returned as an input document**.
    b. Data is one of a company's most important resources but to function properly most organizations do not have to have the data readily and easily accessible.
    c. **Each type of entity possesses the same set of attributes or characteristics of interest that are stored, but the specific data values for those attributes will differ depending on the entity**.
    d. On-line data processing is almost always cheaper and more efficient than batch processing,
    e. **Reaping the potential benefits of ERP systems and mitigating their disadvantages requires conscious effort and involvement by top management**.

2. Which of the following statements is (are) true?
    a. The data capture or input process is usually triggered by a top management decision.
    b. With sequence codes, items are numbered consecutively to account for all items and missing items cause a gap in the numerical sequence.
    c. Cumulative accounting information is stored in general and subsidiary journals.
    d. Computers store data in a field; the fields containing data about entity attributes constitute a record.
    e. **Updating done periodically, such as daily or weekly, is referred to as batch processing**.

3. Which of the following statements is (are) true?
    a. Source data automation devices capture transaction data in paper form at the time and place of their origin.
    b. General ledgers are often used for accounts receivable, inventory, fixed assets, and accounts payable.
    c. **Master files are permanent and exist across fiscal periods; individual master file records may change frequently**.
    d. **When choosing an ERP system, make sure it has a module for every critical company process and that you are not paying for modules that you do not need**.
    e. If an ERP system does not meet your needs, it can almost always be inexpensively modified to meet your unique needs

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4. Which of the following statements is (are) true?
   a. **Using source data automation or well-designed turnaround documents and data entry screens helps ensure captured data are accurate and complete**
   b. **If the sum of all subsidiary ledger account balances does not equal its general ledger control account balance, a recording error has occurred.**
   c. **Online, real-time processing updates transactions as they occur, helping ensure stored information is current and useful in making decision**.
   d. It is usually best to let a user determine what data to input rather than have data input screens list the data the user needs to enter
   e. A group codes is derived from the description of the item and is usually easy to memorize.

5. Which of the following statements is (are) true?
   a. Online batch processing is where transaction data are entered, edited, and processed as they occur.
   b. ERP implementation costs for large companies with multiple sites are usually about half the cost of the ERP user license.
   c. **Well-designed documents and screens improve accuracy and completeness by providing instructions or prompts about what data to collect**
   d. **Data in ledgers is organized logically using coding techniques that assign numbers or letters to items to classify and organize them**.
   e. In an ERP system, data entry controls such as validating data item and checking them for accuracy at the time of initial entry are not needed.

6. Which of the following statements is (are) true?
   a. **Input controls are improved by using pre-numbered source documents or by the system automatically assigning a sequential number to each transaction**.
   b. With mnemonic codes, blocks of numbers are reserved for specific categories of data.
   c. As ERP modules do not automatically trigger additional actions in other modules, it is less important to understand business processes and their interactions.
   d. **In an integrated ERP system, undetected data entry errors can automatically propagate throughout the system**
   e. A purchase to pay ERP module facilitates, production scheduling, work-in-process, quality control, cost management, and manufacturing processes

7. Which of the following statements is (are) true?
   a. **To ensure credit sales policies are followed, the system can be programmed to check a customer's credit limit and payment history**.
   b. A transaction file contains records of individual business transactions and is similar to a general ledger in a manual AIS.
   c. **An ERP system uses a centralized database to share information across business processes and coordinate activities**.

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d. It is difficult for an ERP system to provide management with the up-to-date information needed to plan, control, and evaluate an organization's business
e. Use of pre-numbered documents makes it harder to verify that all transactions have been recorded and that none has been misplaced.

8. Which of the following statements is (are) true?
   a. **A chart of accounts facilitates preparing financial statements because data stored in individual accounts can easily be summed for presentation**.
   b. A database query can provide the information needed to deal with problems and questions that need rapid action or answers.
   c. Repetitive and frequently used database queries are usually developed by users; one-time queries are usually developed by information systems specialists.
   d. Transaction files are permanent and must be maintained for several years for backup purposes.
   e. **A journal entry shows the accounts and amounts to be debited and credited**.

9. Which of the following statements is (are) true?
   a. Transaction data are almost always recorded in a ledger before they are entered into a journal
   b. Documents are records of transaction or other company data that can be printed out or stored as electronic images in a computer
   c. ERP systems are not effective in integrating nonfinancial company operations with a traditional accounting system.
   d. **Since batch processing data are current and accurate only immediately after processing it is used for applications that do not need frequent updating**.
   e. Well-designed screens improve accuracy and completeness by using checkoff boxes or pull-down menus to present the available options

10. Which of the following statements is (are) true?
    a. An audit trail is a transaction path through a data processing system from point of origin to final output, but not backward from final output to point of origin.
    b. The need for reports should be periodically assessed, because they are often prepared long after they are needed, wasting time, money, and resources
    c. **An AIS has traditionally been referred to as a transaction processing system because its only concern was financial data and accounting transactions**.
    d. Accountants and systems developers do not need to understand how data are captured, organized, stored, processed, or accessed.
    e. **A master file, like a ledger in a manual AIS, stores cumulative information about an organization**.

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SUGGESTED ANSWERS TO THE CASES

2.1 Bar Harbor Blueberry Farm

Data from Case

Date	Supplier Invoice	Supplier Name	Supplier Address	Amount
March 7	AJ34	Bud's Soil Prep	PO Box 34	$2,067.85
March 11	14568	Osto Farmers Supply	45 Main	$ 67.50
March 14	893V	Whalers Fertilizer	Route 34	$5,000.00
March 21	14699	Osto Farmers Supply	45 Main	$3,450.37
March 21	10102	IFM Wholesale	587 Longview	$4,005.00
March 24	10145	IFM Wholesale	587 Longview	$ 267.88

Purchases Journal

Page 1

Date	Supplier	Supplier Invoice	Account Number	Post Ref	Amount
March 7	Bud's Soil Prep	AJ34	23	√	$2,067.85
March 11	Osto Farmers Supply	14568	24	√	$ 67.50
March 14	Whalers Fertilizer	893V	36	√	$5,000.00
March 21	Osto Farmers Supply	14699	24	√	$3,450.37
March 21	IFM Wholesale	10102	38	√	$4,005.00
March 24	IFM Wholesale	10145	38	√	$ 267.88
March 31	TOTAL				14,858.60

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General Ledger

Accounts Payable **Account Number: 300**

Date	Description	Post Ref	Debit	Credit	Balance
March 1	Balance Forward				$18,735.55
March 31		√		14,858.60	33,594.15

Purchases **Account Number: 605**

Date	Description	Post Ref	Debit	Credit	Balance
March 1	Balance Forward				$54,688.49
March 31		√	14,858.60		69,547.09

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Account Payable Subsidiary Ledger

Account No: 23	**Bud's Soil Prep**	**PO Box 34**		**Terms: 2/10, Net 30**
Date	Description	Debit	Credit	Balance
March 1	Balance Forward			0.00
March 7	Supplier invoice AJ34		2,067.85	2,067.85

Account No: 24	**Osto Farmers Supply**	**45 Main**		**Terms: 2/10, Net 30**
Date	Description	Debit	Credit	Balance
March 1	Balance Forward			0.00
Mar 11	Supplier invoice 14568		67.50	67.50
Mar 21	Supplier invoice 14699		3,450.37	3,517,87

Account No: 36	**Whalers Fertilizer**	**Route 34**		**Terms: 2/10, Net 30**
Date	Description	Debit	Credit	Balance
March 1	Balance Forward			0.00
March 14	Supplier invoice 893V		5,000.00	5,000.00

Account No: 38	**IFM Wholesale**	**587 Longview**		**Terms: 2/10, Net 30**
Date	Description	Debit	Credit	Balance
March 1	Balance Forward			0.00
Mar 21	Supplier invoice 10102		4,005.00	4,005.00
Mar 24	Supplier invoice 10145		267.88	4,272.88

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CHAPTER 2
OVERVIEW OF TRANSACTION PROCESSING AND ENTERPRISE RESOURCE PLANNING SYSTEMS

Instructor's Manual

Learning Objectives:

1. Describe the data processing cycle used to process transactions, including how data is input, stored, and processed and how information is output.

2. Discuss how organizations use enterprise resource planning (ERP) systems to process transactions and provide information.

Questions to be addressed in this chapter include:

1. How should I organize the accounting records so that financial statements can be easily produced?

2. How am I going to collect and process data about all of S&S's transactions?

3. How do I organize all the data that will be collected?

4. How should I design the AIS so that the information provided is reliable and accurate?

5. How can I design procedures to ensure that they meet all government obligations, such as remitting sales, income, and payroll taxes?

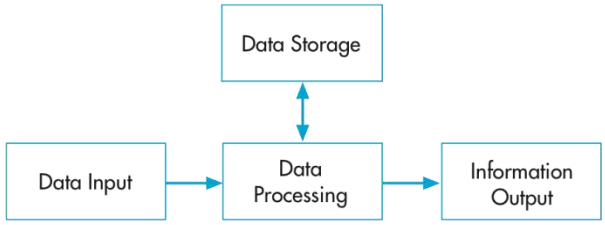
Learning Objective One

Describe the data processing cycle used to process transactions, including how data is input, stored, and processed and how information is output.

Transaction Processing: The Data Processing Cycle

Four Major Steps in the Data Processing Cycle

FIGURE 2-1
The Data Processing Cycle



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1) Data Input
2) Data Storage
3) Data Processing
4) Information Output

The first step in processing transactions is to capture the data for each transaction that takes place and enter them into the system.

Data Input

Data must be collected about **three facets** of each business activity:

1. Each activity of interest
2. The resource(s) affected by each activity
3. The people who participate in each activity

For example, collect the following data about a sales transaction:

1. Date and time of day the sale occurred
2. Employee who made the sale and the checkout clerk who processed the sale
3. Checkout register where the sale was processed
4. Item(s) sold
5. Quantity of each item sold
6. List price and actual price of each item sold
7. Total amount of the sale
8. For credit sales: delivery instructions, customer bill-to and ship-to addresses, customer name

For the above example, the activity of interest is the sales activity. A sales activity involves resources of inventory and cash (the company gives inventory and in exchange receives cash). The people who participated in this activity are the salesperson and the customer.

Source documents are used to capture data at the beginning of the transaction. **Table 2-1 (p. 27)** provides details as to various business activities and related source documents.

Many times this data is automatically captured such as point-of-sale (POS) scanners or even automated invoice scanning that uses scanners that will automatically capture common items from a vendor invoice and processes it to accounts payable. These types of examples are known as source data automation.

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Source documents are documents used to collect data about their business activities. Source documents are also used to support the validity of the business activities.

If paper documents are exchanged with customers or suppliers, data input accuracy and efficiency is improved by using **turnaround documents,** which are records of company data sent to an external party and then returned to the system as input (e.g., remittance slip).

Data Storage

A company's data are one of its most important resources.

Accountants need to know how to manage data for maximum corporate use.

Ledgers

General ledger contains summary-level data for every asset, liability, equity, revenue, and expense account of the organization.

Subsidiary ledger records all the detailed data for any general ledger account that has many individual subaccounts.

These subsidiary ledgers would be used for **accounts receivable** and **accounts payable.**

Accounts receivable subsidiary ledger would record detailed data for customers whom buy products or services on credit.

The accounts receivable subsidiary ledger would support the accounts receivable general ledger controlling account.

Accounts payable subsidiary ledger would record detailed data for the individual vendor credit purchases of merchandise or supplies made by the company.

The accounts payable subsidiary ledger would support the accounts payable general ledger controlling account.

Coding Techniques

Coding is the systematic assignment of numbers or letters to items to classify and organize them.

1. With **sequence codes,** items are numbered consecutively to ensure that there will be no gaps in the sequence.

2. With a **block code,** blocks of numbers within a

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numerical sequence are reserved for categories having meaning to the user.

S&S had the specific range of code numbers for their following major product categories:

Product Code	Product Type
1000000-1999999	Electric range
2000000-2999999	Refrigerator
3000000-3999999	Washer
4000000-4999999	Dryer

3. **Group codes** are often used in conjunction with the block code. S&S uses a seven-digit product code number, for example, the group coding technique might be applied as follows:

Digit Position	Meaning
1-2	Product line, size, style
3	Color
4-5	Year of manufacture
6-7	Operational features

4. **Mnemonic codes** are letters and numbers used in a combination to identify an item. The code is derived from the description of the item and is usually easy to memorize. For example, Dry300W05 could represent a low end (300), white (W) dryer (Dry) made by Sears (05).

In designing a coding system, the following **guidelines** will result in a better coding system:

1. The code should be consistent with its intended use, which requires the code designer to determine the types of system outputs desired by users prior to selecting the code.

2. Make sure the code allows for growth in the number of items to be coded.

3. Make the coding system as simple as possible in order to minimize costs, facilitate memorization and interpretation of coding categories, and ensure employee acceptance.

Make sure the coding system is consistent (1) with the company's organizational structure and (2) across the different divisions of an organization.

Chart of Accounts

A chart of accounts is a list of all general ledger accounts an organization uses with each general ledger account being assigned a specific number.

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Audit Trail: The accounting data and records should provide a trail starting with the source document that supports the transaction (e.g., let's use credit sales) all the way through to the final posting in the general ledger accounts to the financial statements. An audit trail provides a means to check the accuracy and validity of ledger postings.

In auditing, this technique would be called **tracing.** In the opposite direction; from the general ledger to the journals and subsidiary ledgers to the source document; this is called **vouching** for auditors. This is covered in more detail in Auditing Theory and Practice courses.

Computer-Based Storage Concepts

An **entity** is something about which information is stored (e.g., employees, inventory items, and customers).

Each entity has **attributes**, or characteristics of interest, which need to be stored. For example, an employee's hourly rate of pay, unit cost of an inventory item, and a customer's address.

Figure 2-3 on page 32 provides examples of data storage elements:

1. Data values are stored in a physical space called a **field.** In the figure the fields are Customer number, Customer name, Address, Credit limit, and Balance.

2. A row of fields that contain data about various attributes (values) of the same entity forms a **record.** In the figure the records are represented by each of the three rows; so there are three records.

3. The contents of each field within a record are called a **data value.** Sometimes, not mentioned in this book, the contents of each field are called a specific **data element** which contains value the data.

4. In turn, data elements/data value is composed of **characters** such as letters, numbers, and symbols.

5. Related records are grouped to form a **file.**

6. Two basic types of files exist:

   - A **master file** is conceptually similar to a ledger in a manual AIS.

   - The second basic type of file is called a **transaction file**, which is conceptually similar to a journal in manual AIS.

Data Processing

Once data about a business activity have been collected and entered into the system they must be processed.

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Data processing implies the execution of certain procedures, usually involving a series of tasks.

There are four different types of file processing, referred to as CRUD:

1. **Creating** new data records, such as adding a new employee to the payroll master file or database after they have been hired

2. **Reading**, retrieving, or viewing existing data.

3. **Updating data** previously stored about the activity, the resources affected by the activity, or the people who performed the activity (see Figure 2-4, page 33).

4. **Deleting data**, such as purging the vendor master file of all vendors that the company no longer does business with

Periodic updating of data is referred to as **batch processing.** This approach may be combined with either the offline or online entry of data.

Under the **online entry**, **real-time processing** method of processing, individual transactions are entered directly into the computer via a terminal as they occur; thus, ensuring that stored information is always current.

Information Output

This is the **final step** in the data processing cycle.

Forms of Information Output

Documents are records of transaction or other company data, such as checks and invoices.

Documents generated at the end of transaction processing activities are called **operational documents** to distinguish them from **source documents**, which are used at the beginning of the process.

Reports are prepared for both internal and external users. We are all familiar with the external reports called financial statements.

Information needs cannot always be satisfied strictly by documents or periodic reports. Instead, problems and questions constantly arise that need rapid action or answers. To respond to this problem, personal computers or terminals are used to **query** the system. For example, it is much easier for a customer service employee to help solve a customer billing problem by looking up the information instead of looking through several different reports.

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Purpose of Output

There are **four main types** of **financial reports** that were covered in Principles of Accounting I & II courses, the **balance sheet, income statement, statement of owner's equity**, or **statement of stockholder's equity**, and the **statement of cash flows**. Sometimes a **statement of retained earnings** is used instead of the **statement of stockholder's equity**. These financial statements are used by both external and internal users.

Budgets are used by the management of the firm. Budgets require estimating future revenue/sales, cost, and expenses. This is the **operational budget.** There are also **cash budgets** and **capital expenditure budgets.**

Multiple Choice 1

Which of the following is NOT a step in the data processing cycle?
a. Data collection

b. Data input
c. Data storage
d. Data processing

Multiple Choice 2

Recording and processing information about a transaction at the time it occurs is referred to as which of the following?
a. Batch processing
b. Online, real-time processing
c. Captured transaction processing
d. Chart of accounts processing

Multiple Choice 3

How does the chart of accounts list general ledger accounts?
a. Alphabetical order
b. Chronological order
c. Size order
d. The order in which they appear in financial statements

Multiple Choice 4

Which one below is not a type of data processing activity?
a. Creating
b. Updating
c. Recording
d. Reading

For class discussion:
Why is it important for an accountant to understand their business and industry as well as managements informational needs in addition to

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knowing how to generate financial statements? (You may use S&S as the context while asking this question.)

This discussion question is useful to get students to understand that accounting information is not just about knowing debits and credits. The role of an accountant is an important role in understanding the business information, how to incorporate controls for that information, and how to help management measure performance by providing insight, foresight, and oversight to the business. Hence, an accountant can be an active member of the business management team.

Learning Objective Two

Discuss how organizations use enterprise resource planning (ERP) systems to process transactions and provide information.

ERP systems are designed to overcome problems as they integrate all aspects of a company's operations with its traditional AIS.

A key feature of ERP systems is the integration of financial with other nonfinancial operating data. More sophisticated ERP systems are using tools to integrate external information with their internal information to be more proactive in managing the business.

Multiple Choice 5

Which of the following is NOT an advantage of an ERP system?
a. Better access control
b. Standardization of procedures and reports
c. Improved monitoring capabilities
d. Simplicity and reduced costs

Class Discussion Question:

Think about the various forms of social media (e.g., Twitter, Facebook) would this nonfinancial information external to the company be of use? What other nonfinancial information would be useful? Could you think of financial information that is external to the organization that might be useful to management as well?

This discussion question is to get the students thinking in a "data analytic mindset" because organizations need to compete in a global market which requires synthesizing information that is both internal and external to the organization. For example, Walmart uses sales information as well as weather forecasts to predict which items stores should be stocked up on during a hurricane (NYtimes.com 2004). This allows the company to use past information from within the organization and synthesize it with external information to be more proactive. In

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addition, IBM purchased weather.com specifically so weather data analytics can be used by organizations to better predict their inventory needs (Thurai, November 9, 2015)

Source: www.nytimes.com/2004/11/14/business/yourmoney/14wal.html?_r=1&

www.ibmbigdatahub.com/blog/business-value-weather-data

Answers to Multiple Choice Questions:

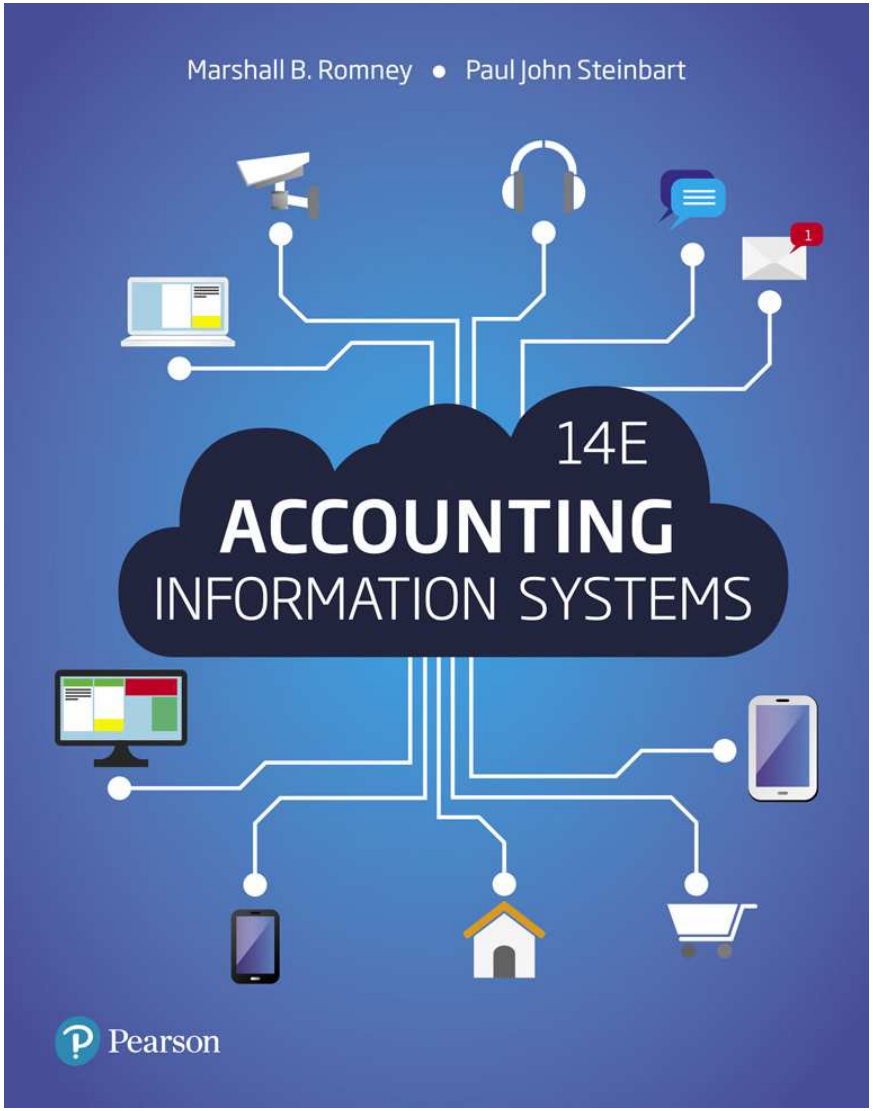
Multiple Choice Number	Multiple Choice Answer
1	A
2	B
3	D
4	C
5	D

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Chapter 2

Overview of Transaction Processing and Enterprise Resource Planning Systems

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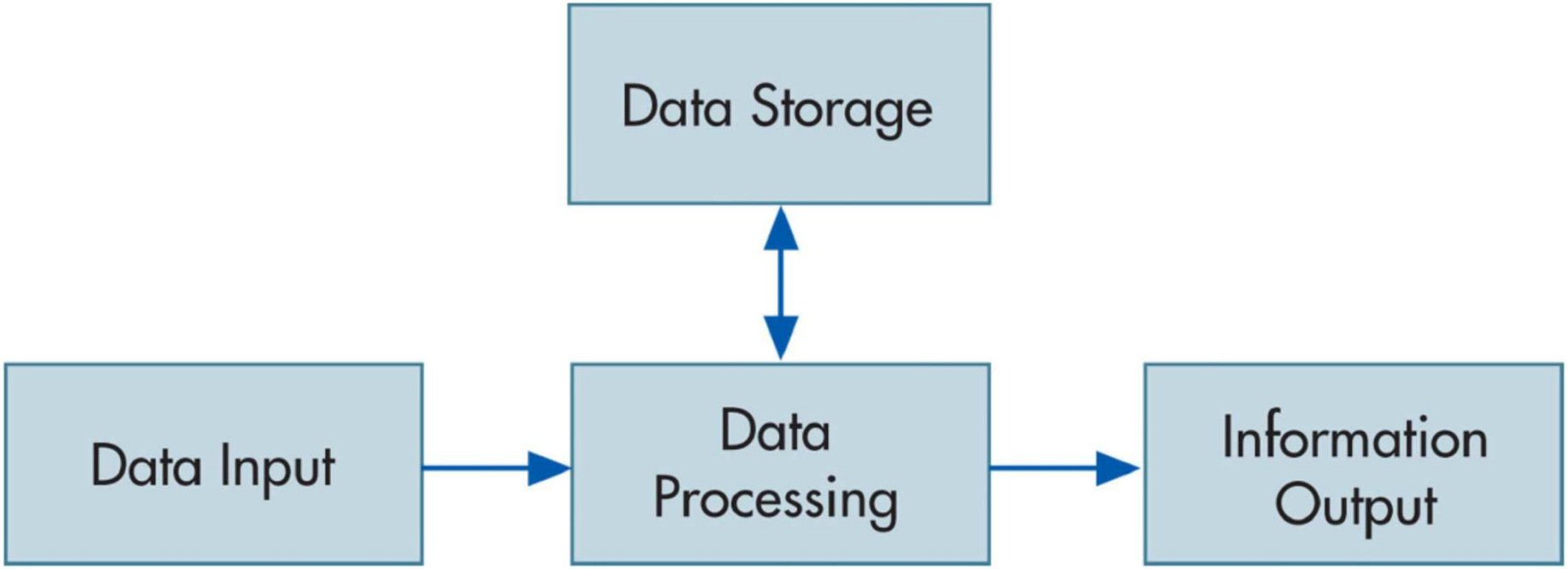
Learning Objectives

- Describe the data processing cycle used to process transactions, including how data is input, stored, and processed and how information is outputted.
- Discuss how organizations use enterprise resource planning (ERP) systems to process transactions and provide information.

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Data Processing Cycle



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Data Input

Steps in Processing Input are:

- Capture transaction data triggered by a business activity (event).
- Make sure captured data are accurate and complete.
- Ensure company policies are followed (e.g., approval of transaction).

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Data Capture

- Information collected for an activity includes:
  - Activity of interest (e.g., sale)
  - Resources affected (e.g., inventory and cash)
  - People who participated in the activity (e.g., customer and employee)
- Information comes from source documents.

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Source Documents

- Captures data at the source when the transaction takes place
  - Paper source documents
  - Turnaround documents
  - Source data automation (captured data from machines, e.g., Point of Sale scanners at grocery store)

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Data Storage

- Important to understand how data is organized
  - Chart of accounts
    - Coding schemas that are well thought out to anticipate management needs are most efficient and effective
  - Transaction journals (e.g., Sales)
  - Subsidiary ledgers (e.g., Accounts receivable)
  - General ledger

  Note: With the above, one can trace the path of the transaction (audit trail)

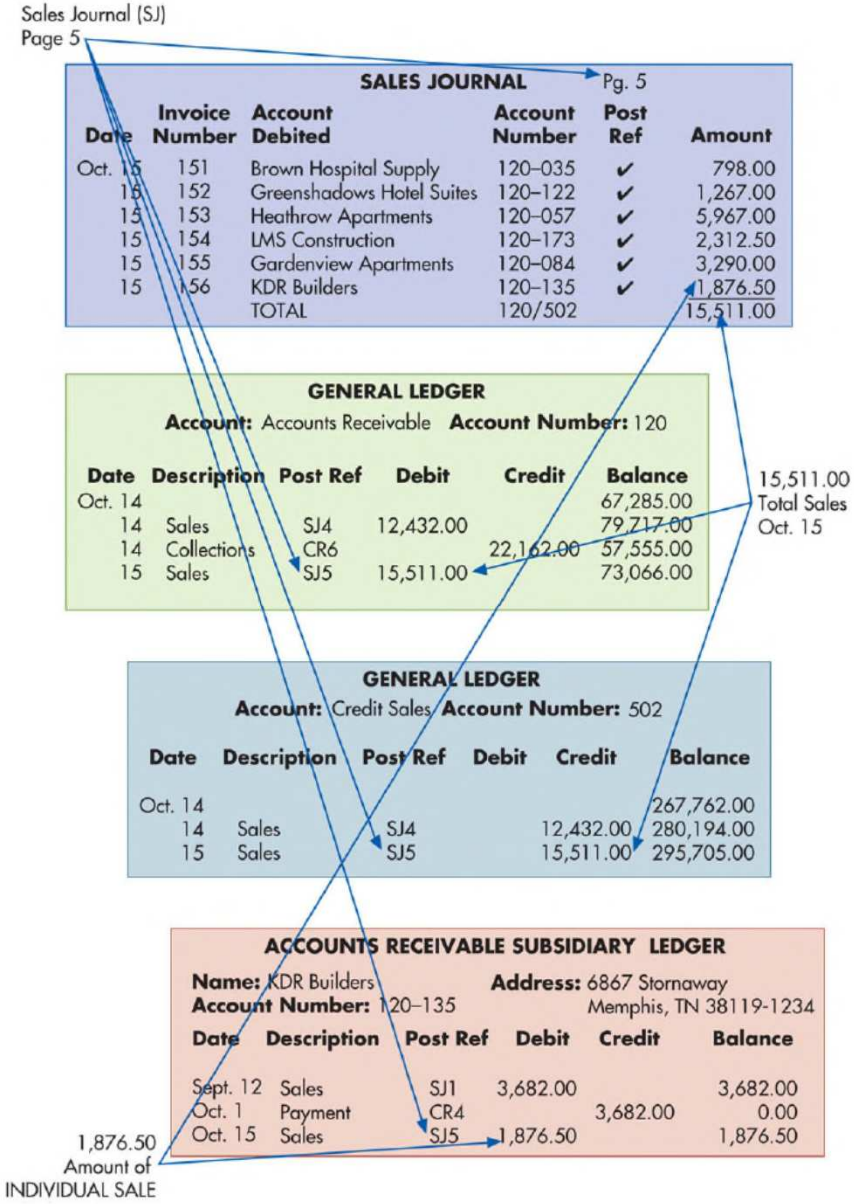
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Coding Techniques

- **Sequence codes**—items numbered consecutively to account for all items (i.e., prenumbered forms)
- **Block code**—blocks of numbers reserved for specific categories of data (i.e., product numbers that start with a 2 are refrigerators)
- **Group codes**—two or more subgroups of digits used to code items (i.e., car vin #'s)
- **Mnemonic codes**—letters and numbers interspersed to identify an item (i.e. Dry300W05 is low end (300), white (W) dryer (DRY) made by Sears (05))

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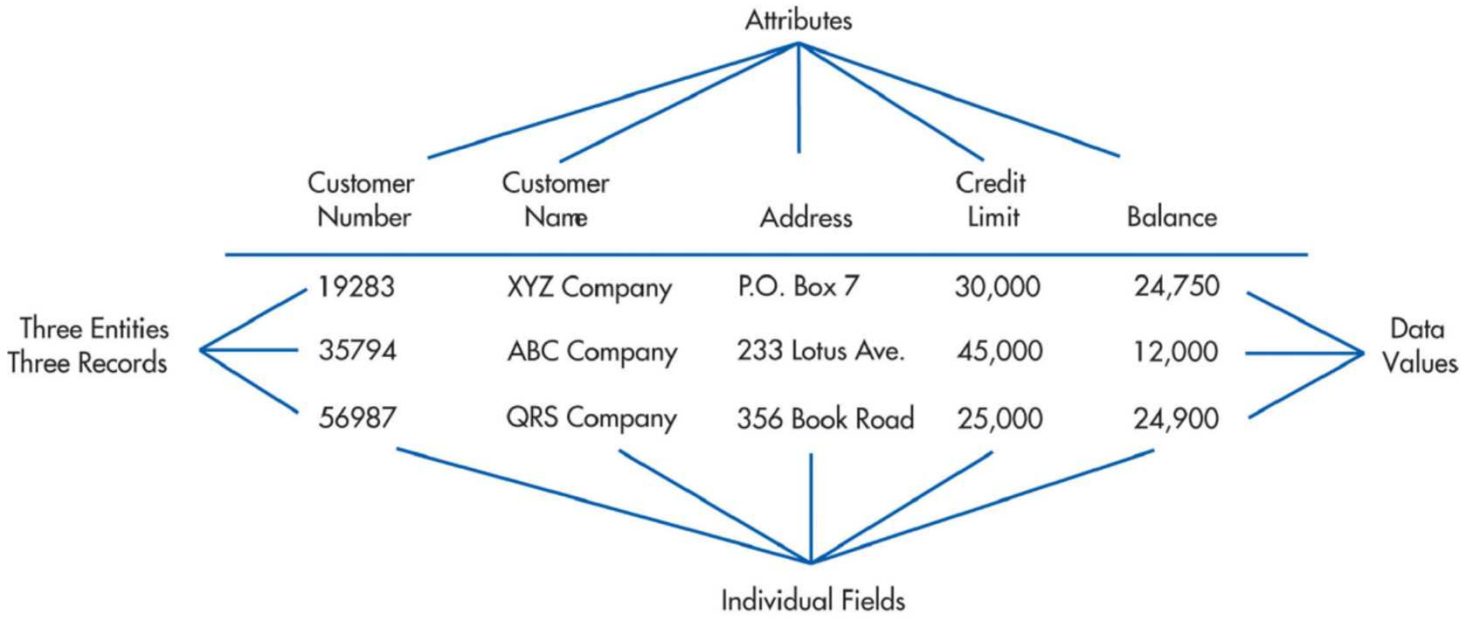
Audit trail for Invoice #156 for $1,876.50 sold to KDR Builders

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Computer-Based Storage

- Data is stored in master files or transaction files.



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Data Processing

Four types of processing (CRUD):

- **C**reating new records (e.g., adding a customer)
- **R**eading existing data
- **U**pdating previous record or data
- **D**eleting data

Data processing can be batch processed (e.g., post records at the end of the business day) or in real-time (process as it occurs).

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Information Output

The data stored in the database files can be viewed

- Online (soft copy)
- Printed out (hard copy)
  - Document (e.g., sales invoice)
  - Report (e.g., monthly sales report)
  - Query (question for specific information in a database, e.g., Which division had the most sales for the month?)

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Enterprise Resource Planning (ERP) Systems

- Integrates activities from the entire organization
  - Revenue Cycle
  - Expenditure Cycle
  - Production Cycle
  - H/R Payroll Cycle
  - General Ledger and Reporting System

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Advantages of ERP System

- Integrated enterprise-wide single view of the organization's data which streamlines the flow of information
- Data captured once (i.e., no longer need sales to enter data about a customer and then accounting to enter same customer data for invoicing)
- Greater visibility and monitoring capabilities for management
- Improve access of control of the data through security settings
- Standardization of procedures and reports
- Improves customer service
- Increases productivity through automation

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Disadvantages of ERP System

- Costly
- Significant amount of time to implement
- Customizing or standardizing a business process
- Complexity
- User resistance (learning new things is sometimes hard for employees)

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Key Terms

- Data processing cycle
- Source documents
- Turnaround documents
- Source data automation
- General ledger
- Subsidiary ledger
- Control account
- Coding
- Sequence code
- Block code
- Group code
- Mnemonic code
- Chart of accounts
- Specialized journal
- Audit trail
- Entity
- Attributes
- Field
- Record
- Data value
- File
- Master file
- Transaction file
- Database
- Batch processing
- Online, real-time processing
- Document
- Report
- Query
- Enterprise resource planning (ERP) system

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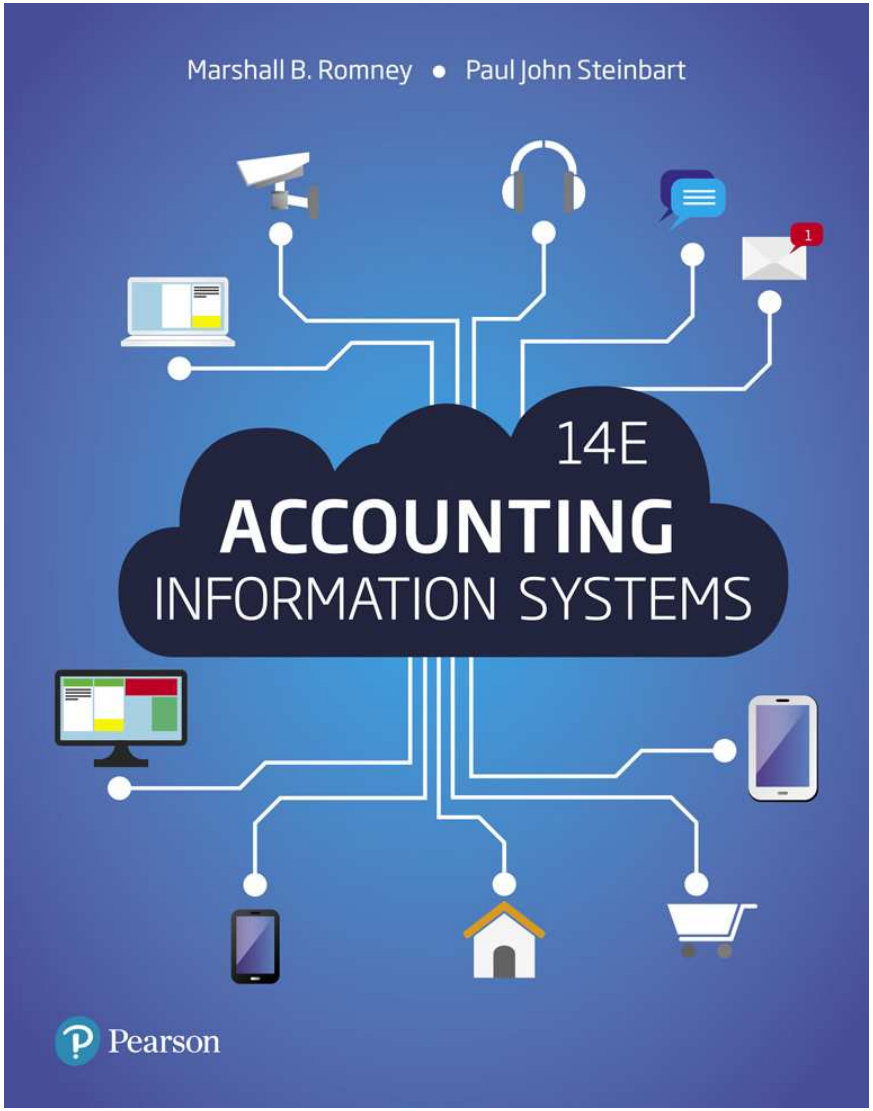


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Chapter 2

Overview of Transaction Processing and Enterprise Resource Planning Systems

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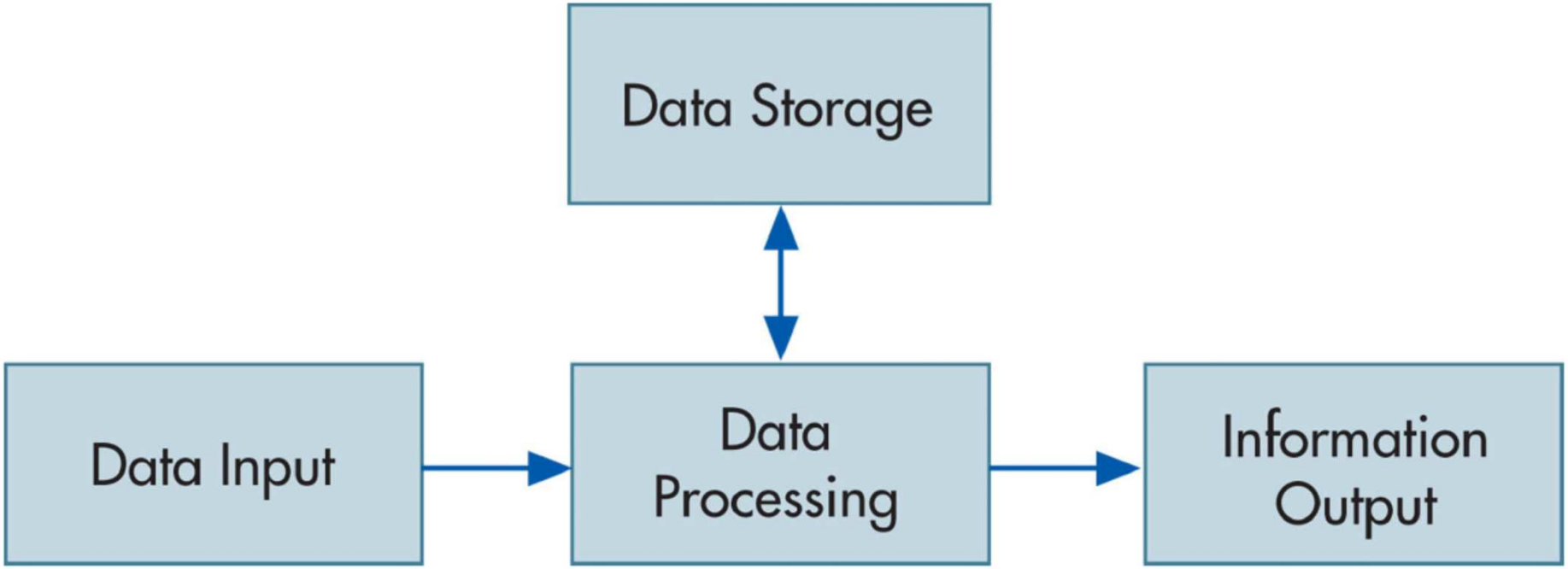
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- Describe the data processing cycle used to process transactions, including how data is input, stored, and processed and how information is outputted.
- Discuss how organizations use enterprise resource planning (ERP) systems to process transactions and provide information.

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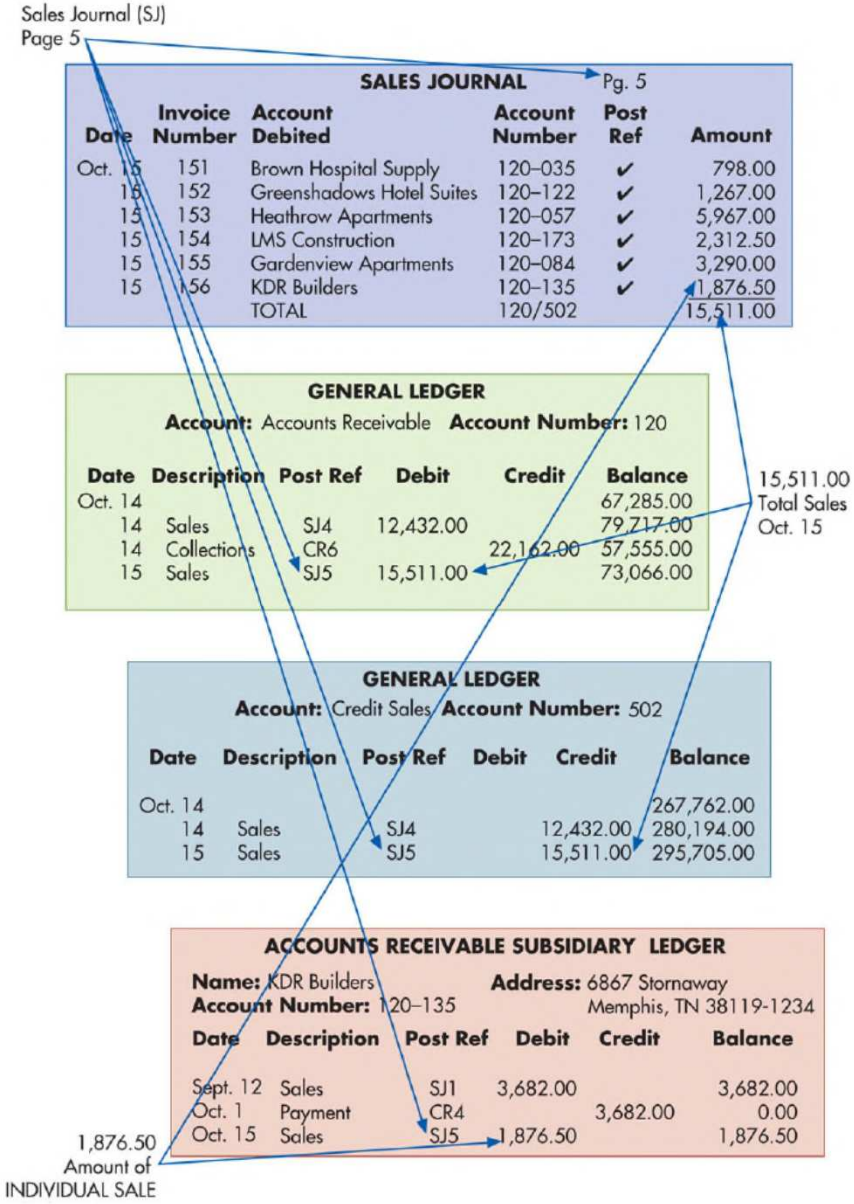
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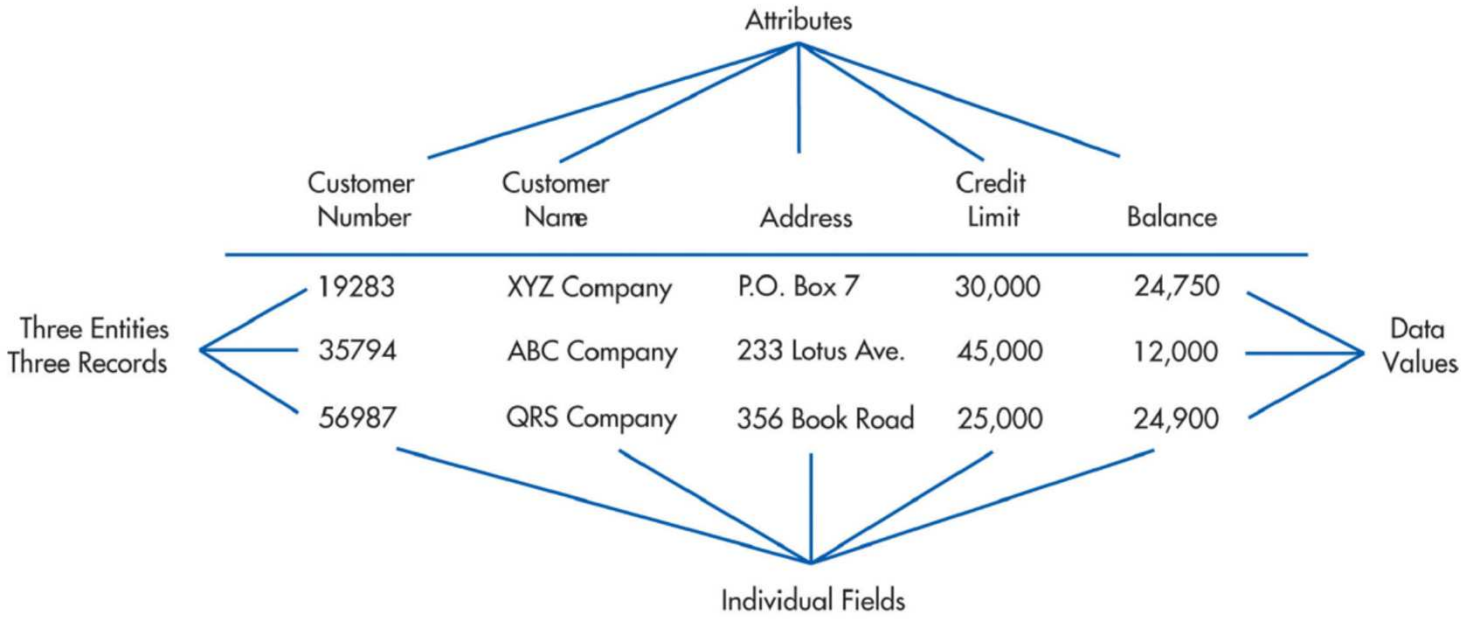
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