**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:**

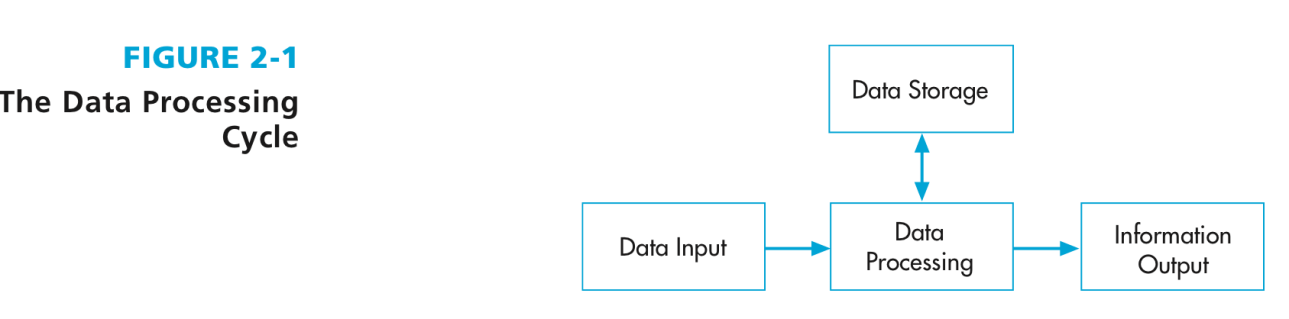
1. How should I organize the accounting records so that financial statements can be easily produced?
2. How am I going to collect and process data about all of S&S’s transactions?
3. How do I organize all the data that will be collected?
4. How should I design the AIS so that the information provided 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**

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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. 53)** 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.

**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 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

1. **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. Product line, size, style

3 Color

4-5 Year of manufacture

6-7 Operational features

1. **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.

**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 audittrail provides a means to check the accuracy and validity of ledger postings.

In auditing, this technique would becalled **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 58** 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.

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 59).
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.

**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 ofthe **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?

1. Creating
2. Updating
3. Recording
4. 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 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?

1. Better access control
2. Standardization of procedures and reports
3. Improved monitoring capabilities
4. 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 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.nytimes.com/2004/11/14/business/yourmoney/14wal.html?_r=1&)

[*www.ibmbigdatahub.com/blog/business-value-weather-data*](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** |