**CHAPTER 1**

**ACCOUNTING INFORMATION SYSTEMS: AN OVERVIEW**

**Instructor’s Manual**

**Learning Objectives**:

1. Distinguish between data and information, discuss the characteristics of useful information, and explain how to determine the value of information.
2. Explain the decisions an organization makes and the information needed to make them, and the major business processes present in most companies.
3. Explain how an AIS adds value to an organization, how it affects and is affected by corporate strategy, and its role in a value chain.

**Learning Objective One**

**Distinguish data from information, discuss the characteristics of useful information, and explain how to determine the value of information.**

**Systems, Data, and Information**

**Systems**

A **system** is a set of detailed methods, procedures, and routines that carry out specific activities, perform a duty, achieve goals or objectives, or solve problems.

Systems are almost always composed of smaller subsystems

Each subsystem is designed to achieve one or more organizational goals.

For example, the college of business is a system composed of various subsystems known as departments (e.g., Marketing, Management, Accounting, etc.).

Each subsystem is designed to achieve one or more organizational goals, changes in subsystems cannot be made without considering the effect on other subsystems and the system as a whole.

**Goal conflict** occurs when a subsystem’s goals are inconsistent with the goals of another subsystem or the system as a whole.

**Goal congruence** isachieved when a subsystem achieves its goals while contributing to the organization’s overall goal.

**Data**

**Data** are facts that are collected, recorded, stored, and processed by an information system.

Several kinds of data need to be collected in businesses, such as:

1. Facts about the activities that take place (e.g., date, total amount).
2. The resources affected by the activities (e.g., number of units).
3. The people who participate in the activity (e.g., S&S).

**Information**

**Information** is data that have been organized and processed to provide meaning and context that can improve the decision-making process.

If using the example of data provided above—date, number of units, and S&S—would you be able to determine if this is a sales transaction, purchase transaction, or any other type of transaction? No, because it is not organized and contextual, meaning it is not determinable. You would need to know that the context of the transaction is a sales transaction and S&S is a customer (as opposed to a vendor). Number of units are number of units sold.

Data is most useful when it is machine-readable and standardized such that it can be processed by a computer with little human intervention.

For example, digital transaction information such as “IR144, $12.95, Infrared reader, 3, $38.85” might be presented digitally, but the meaning of that data is not clear. This might be a purchase transaction or a sales transaction. IR144 might represent a transaction ID, employee ID, vendor ID, or customer ID.

Taxonomies have been created to embed meaning in digital data. XBRL is a taxonomy that structures business information for communication between business systems. Using the XBRL taxonomy is quite complex and embeds a lot of information about the characteristics and constraints of each data field. An XBRL presentation of Cash of 11,000 from a balance sheet for 2022 may be represented in XBRL as

<iascf-pfs:CashCashEquivalents numericContext="Group2022AsOf">11000</iascf-pfs:CashCashEquivalents>

Note the tag name of CashCashEquivalents. Tag names have to be created in XBRL for all financial statement elements. Also, note the attribute numericContext that has a value of Group2020AsOf. This provides additional context to the value of 11,000. The XBRL taxonomy does not have elements for tagging individual transactions. Thus XBRL cannot effectively ‘tag’ the transaction noted above. The UBL taxonomy, an open source taxonomy for tagging business transactions has a schema for invoices. <http://docs.oasis-open.org/ubl/os-UBL-2.2/UBL-2.2.html> Below is an example of how the data above might be tagged in that taxonomy.

<cac:InvoiceLine>

<cbc:ID>1</cbc:ID>

<cbc:InvoicedQuantity>3</cbc:InvoicedQuantity>

<cbc:LineExtensionAmount currencyID="USD">38.85</cbc:LineExtensionAmount>

<cac:Item>

<cbc:Name>Infrared reader</cbc:Name>

<cac:SellersItemIdentification>

<cbc:ID>IR144</cbc:ID>

</cac:SellersItemIdentification>

</cac:Item>

<cac:Price>

<cbc:PriceAmount currencyID="USD">12.95</cbc:PriceAmount>

</cac:Price>

</cac:InvoiceLine>

Tagging data with agreed upon taxonomies allows data elements and their context to be transmitted between systems. It also improves reliability, relevance, accessibility, understandability, and timeliness.

There are limits to the amount of information the human mind can effectively absorb and process.

**Information overload** occurs when those limits are passed.

When you get more information than you can effectively assimilate, you suffer from information overload.

* + - Example: Final exams week!

When you have reached the overload point, the quality of decisions declines while the costs of producing the information increases.

**Information Technology (IT)** are computers and other electronic devices used to store, retrieve, transmit, and manipulate data to help decision makers more effectively filter and condense information.

The value of information is the benefit produced by the information minus the cost of producing it. Benefits include reduced uncertainty, improved decisions, and improved ability to plan and schedule activities. Costs include the time and resources spent to produce and distribute information.

A good example of the value of information is provided on page 5 for the 7-Eleven stores in Japan. Each store uses information for:

1. Keeping track of the 3,000 items sold in each store and determining what products are moving, at what time of the day, and under what weather conditions.
2. Keeping track of customers (what and when they buy). If their best customers are single men, for example, the store makes sure it has the fresh rice dishes they purchase on their lunch hour and at the end of the workday.
3. Ordering sandwiches and rice dishes from suppliers automatically. Orders are placed and filled three times a day so stores can always have fresh food. 7-Eleven allows its suppliers to access sales data in their computers so they can forecast demand.
4. Coordinating deliveries with suppliers. This allows the stores to reduce the number of deliveries from 34 to 12 a day, resulting in less clerical receiving time.
5. Preparing a color graphic display that indicates which store areas contribute the most to sales and profits.

**Table 1-1** on **page 4** provides the fourteen characteristics that make information useful and meaningful for decision making.

1. Access Restricted
2. Accurate
3. Available
4. Reputable
5. Complete
6. Concise
7. Consistent
8. Current
9. Objective
10. Relevant
11. Timely
12. Useable
13. Understandable
14. Verifiable

**Multiple Choice 1**

Data differ from information in which way?

a. Data are facts about a sale

b. Information is data organized to provide meaning

c. Data are meaningful bits of information

d. There is no difference

**Multiple Choice 2**

Which of the following is *not* a characteristic that makes information useful?

a. It is reputable

b. It is timely

c. It is inexpensive

d. It is relevant

**Learning Objective Two**

**Explain the decisions an organization makes and the information needed to make them, and the major business processes present in most companies.**

**.**

**Key Decisions and Information Needs**

Using the S&S case, we can determine what information will be needed to make better decisions. An information system is comprised of the people and technology that produce information. Information in an organization is organized through a set of related, coordinated, and structured activities and tasks, performed by a person, a computer, or a machine that help accomplish a specific organizational goal known as a **business process**. The case will help students to understand that before collecting data and processing it into information, the decisions that management and other external users will be making need to be known first. Only after this is known can we begin designing and using the AIS to capture, collect, and process the correct data as needed by decision makers. These information needs and key decisions are provided in **Table 1-2** on **page 6.**

**Multiple Choice 3**

What information needs are generally associated with the acquire inventory business process?

a. Market Analysis

b. Vendor Performance

c. Inventory status reports

d. All of the above

**Learning Objective Three**

**Explain how an AIS adds value to an organization, how it affects and is affected by corporate strategy, and its role in a value chain.**

**Business Processes**

Taking the list of specific business processes from S&S it is easier to group them into related transactions. A **transaction** is an agreement between two entities to exchange goods or services or any other event that can be measured in economic terms by an organization. **Transaction processing** is the process of capturing transaction data, processing it, storing it for later use, and producing information output such as a financial statement. The activities between two entities are pairs of events involved in **give-get exchange** (e.g., give inventory to a customer, get cash from the customer). These frequent give-get exchanges that occur in companies are grouped around **business processes or transaction cycles** and are:

1. The **Revenue Cycle (AKA customer to cash (C2C)**—Activities associated with selling goods and services in exchange for cash or future promise to receive cash (Accounts Receivable).
2. The **Expenditure Cycle**—(AKA purchase to pay (P2P))Purchase of inventory for resale or raw materials for use in production in exchange for cash or a promise to pay cash in the future (Accounts Payable).
3. The Production or Conversion Cycle—Raw materials are converted into finished goods.
4. The Human Resource/Payroll Cycle—Employees are hired, trained, compensated, evaluated, promoted, and terminated.
5. The Financing Cycle—Companies acquire capital by selling shares or borrowing money and where investors are paid dividends or interest.

For each of these processes there is a basic give-get relationship. **Figure 1-2** on **page 7** provides a description of the basic give-get exchanges.

1. Revenue Cycle—Give goods, get cash or A/R.
2. Expenditure Cycle—Give cash or A/P, get goods or raw materials.
3. Production Cycle—Give labor and raw materials, get finished goods.
4. Human Resource—Give cash, get labor.
5. Financing Cycle—Give cash, get cash.

Figure 1-3 on **page** 8 shows the relationship between these cycles and the **general ledger and reporting system** function which is used to generate information for both management and external parties.

**Multiple Choice 4**

Which transaction cycle includes interactions between an organization and its suppliers?

a. Revenue cycle

b. Expenditure cycle

c. Human resources/payroll cycle

d. General ledger and reporting system

**Multiple Choice 5**

In which cycle does a company ship goods to customers?

a. Production cycle

b. Financing cycle

c. Revenue cycle

d. Expenditure cycle

**Accounting Information Systems**

An **accounting information system (AIS)** is a system that collects, records, stores, and processes data to produce information for decision makers.

This is illustrated in **Figure 1-4 on** **page 11.**

An AIS can be a pencil and paper manual system or one that involves the latest technology.

**Six components of an AIS**

1. The **people** who operate the system and perform various functions.
2. The **procedures and instructions,** both manual and automated, involved in collecting, processing, and storing data about the organization’s activities.
3. The **data** about the organization and its business processes.
4. The **software** used to process the organization’s data.
5. The **information technology infrastructure,** including computers, peripheral devices, and network communications devices used to collect, store, process, and transmit data and information.
6. The **internal controls** and **security measures** that safeguard the data in the AIS.

These six components enable an AIS to fulfill **three important business functions:**

1. **Collect and store data** about organizational activities, resources, and personnel.
2. **Transform data into information** that is useful for making decisions so management can plan, execute, control, and evaluate activities, resources, and personnel.
3. **Provide adequate controls** to safeguard the organization’s assets, including its data, to ensure that the assets and data are available when needed and the data are accurate and reliable.

**Multiple Choice 6**

Which of the following is a function of an AIS?

a. Reducing the need to identify a strategy and strategic position.

b. Transforming data into useful information.

c. Allocating organizational resources.

d. Automating all decision making.

**How an AIS Can Add Value to an Organization**

1. **Improve the quality** and **reduce the costs** of products or services.
2. **Improve efficiency.** A well-designed AIS can make operations more efficient by providing more timely information.
3. **Share knowledge.** A well-designed AIS can make it easier to share knowledge and expertise, perhaps thereby improving operations and even providing a competitive advantage.
4. **Improve** the **efficiency** and **effectiveness** of its supply chain.
5. **Improve** the internal control structure.
6. **Improve** decision making.

**Multiple Choice 7**

An AIS provides value by:

a. improving products or services through information that increases quality and reduces costs

b. providing timely and reliable information to decision makers

c. creating new products

d. both A and B

**An AIS Can Use Artificial Intelligence and Data Analytics to Improve Decision Making**

Artificial Intelligence uses computer systems to simulate human intelligence processes such as learning, reasoning, and self-improvement. Within accounting AI may be used to automate parts of the financial reporting process, the audit, and many operational decisions.

Data Analytics is the use of software and algorithms to discover, describe, interpret, communicate, and apply meaningful patterns to improve business performance. Data analytics have long been used to analyze past performance. Increasingly data analytics are designed to focus on the future.

A data dashboard is an essential part of most analytic tools. It displays important data points, key metrics, and key performance indicators in the form of graphs, tables, and gauges.

**The AIS and Blockchain**

Blockchain is appropriately named as it chains blocks of data together through the use of cryptography algorithms that create hashes. The hash of a prior block is included in the latest block, creating the chain. At a high level a blockchain repeatedly executes the following 5 steps:

1. Initiate transaction
2. Validate transaction
3. Create a block
4. Calculate and insert a hash
5. Complete transaction

A detailed discussion of the processes of using and maintaining a blockchain are covered in Chapter 11.

Blockchain advantages include:

1. Accuracy
2. Transparency
3. Data consistency
4. Trust
5. No need for third parties
6. Single set of books
7. Cost
8. Decentralization
9. Efficiency
10. Privacy
11. Security
12. Provenance

Blockchain disadvantages include:

1. Cost
2. Loss of privacy and confidentiality
3. Susceptibility

**Cloud Computing, Virtualization, and the Internet of Things**

Cloud computing takes advantage of the modern global network to allow individuals to access software (software as a service), hardware (infrastructure as a service), and application environments (platform as a service) remotely. Variations include: public, private, or hybrid clouds, depending on whether the remote resources are owned by the user.

Virtualization is the installation of multiple computing environments in a single physical computer. A corporation might virtualize their database server, email server, and file server (three separate computing environments – each with their own operating system) on a single physical computer. This cuts hardware costs and reduces maintenance costs.

The Internet of Things (IOT) refers to the embedding of sensors in a multitude of devices that are capable of communicating (sharing data) with the internet. IOT allows for monitoring and control of many common devices such as heating, appliances, and lights from any internet connection in the world. There are significant security implications to the IOT.

**The AIS and Corporate Strategy**

**Figure 1-5** on **page 19** shows three factors that influence the design of an AIS: IT developments, business strategy, and organizational culture.

For example, the growth of the internet has affected the way many value chain activities are performed.

The internet makes a company’s products available almost anywhere.

An organization’s AIS play an important role in helping it adopt and maintain a strategic position.

The information system can collect financial and nonfinancial data about the organization’s activities.

**The Role of the AIS in the Value Chain**

The role of an AIS in the **value chain** is detailed in **Figure 1-6** on **page 19** showing the linking together of all the primary and support activities in a business**.** The objective of most organizations is to **provide value** to their **customers.**

**Five primary activities** that directly provide value to its customers:

1. **Inbound logistics** consists of receiving, storing, and distributing the materials an organization uses to create the services and products it sells.
2. **Operations** activities transform inputs into final products or services.
3. **Outbound logistics** activities distribute finished products or services to customers.
4. **Marketing and sales** activities help customers buy the organization’s products or services.
5. **Service** activities provide post-sale support to customers.

**Four Categories of Support Activities**

1. **Firm infrastructure** is the accounting, finance, legal, and general administration activities that allow an organization to function.
2. **Human resources** activities include recruiting, hiring, training, and providing employee benefits and compensation.
3. **Technology** activities improve a product or service.
4. **Purchasing** activities procure raw materials, supplies, machinery, and the buildings used to carry out the primary activities.

**Supply Chain [Figure 1-7 on Page 20]** shows an extended system that includes an organization’s value chain (manufacturer) as well as suppliers, distributers, retailers, and customers.

1. Raw Materials Supplier
2. Manufacturer
3. Distributor
4. Retailer
5. Consumer

**Multiple Choice 8**

The value chain concept is composed of the following two types of activities:

1. Primary and secondary
2. Primary and support
3. Support and value
4. Technology and support

**Multiple Choice 9**

Which of the following is a primary activity in the value chain?

a. Purchasing

b. Accounting

c. Post-sales service

d. Human resource management

**Multiple Choice 10**

Which of the following is a support activity in the value chain?

a. Purchasing

b. Manufacturing

c. Post-sales service

d. Receiving materials

**Answers to Multiple Choice Questions:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Multiple Choice Number** | **Multiple Choice Answer** | **Multiple Choice Number** | **Multiple Choice Answer** |
| **1** | **B** | **6** | **B** |
| **2** | **C** | **7** | **D** |
| **3** | **D** | **8** | **B** |
| **4** | **B** | **9** | **C** |
| **5** | **C** | **10** | **A** |

**References Used:**

1. Michael E. Porter and Victor E. Millar, How Information Gives You Competitive Advantage. *Harvard Business Review*, (July–August 1985), pp. 149–160.
2. Michael E. Porter, What Is Strategy? *Harvard Business Review*, November-December 1996), pp. 61-78.