ACCOUNTING INFORMATION SYSTEMS

Chapter One

Fundamentals of Accounting Information Systems

Unit Introduction

Accounting information systems (AIS) are an essential component of the successful operation of any commercial enterprise. They are meant to gather, analyze, retain, and transmit financial and accounting data in order to assist decision-making and control activities. They are designed to do so in a variety of ways. Understanding the principles of AIS is necessary to have a complete comprehension of how these systems function and how they might enhance the efficacy and efficiency of financial and accounting operations (Romney et al., 2012).

Artificial intelligence and security have progressed from manual to computer-based systems throughout history, and they continue to expand with the introduction of new technologies, such as cloud computing and artificial intelligence. An AIS must have the hardware, software, data, personnel, and procedures to function properly. The term "hardware" refers to the physical components of a system, including servers and computers, that are employed in the data collection and processing processes (Bagranoff, 2007). Accounting software is one example of the types of applications included in the software. These programs are used to organize data and carry out computations. Data contains the accounting and finance statistics used by the system, such as sales data, inventory data, and financial statements. People are the system's utilizers, such as managers, accountants, and external auditors. Internal controls and audit processes are examples of the methods included in procedures. These methods are used to guarantee that the data are accurate and complete (Doost et al., 2003).

The three main elements involved in AIS are the accounting cycle, the data flow diagram, and the system development life cycle. The recording, categorizing, and summarizing of financial transactions is the process that makes up the accounting cycle, which is used to prepare financial reports. The data flow diagram is a graphical representation of the data flow through the system, including all of the system's inputs, processes, and outputs. The process of planning, creating, validating, and implementing an AIS is known as the system development life cycle (Daigle et al., 2007).

Figure 1.1. Illustration of Accounting Information System (Source: Scott Parry, Creative Commons License).

A system is a set of comprehensive processes that perform particular operations, execute tasks, accomplish goals or address problems. The majority of systems comprise numerous subsystems that maintain the overarching system. For instance, a business institution can be considered a system comprising many departments, each of which can be considered a subsystem. In addition, the college is a component of the larger university system (Anandarajan et al., 2004).

One or more organizational goals are incorporated into the development of each individual subsystem. Before making any changes to a subsystem, one must first analyze how those changes would influence the system and the other subsystems. A goal conflict arises when the objectives of one subsystem are incompatible with those of another subsystem or the system as a whole. Goal congruence is the achievement of a subsystem's goals while progressing toward the organization's overarching objective. It becomes increasingly difficult to accomplish goal congruence within an AIS in proportion to the organization's size and the system's complexity level (Cugueró & Rosanas, 2013).

Data are information gathered, recorded, saved, and processed by a computer or other information system. Companies must gather various data, including information regarding the activities, the resources impacted by the activities, and the employees participating in the activities. For instance, the company has to gather information on a sale, the sold resource, and the individuals who took part in the sale (customer, salesperson) (Kaplan et al., 1998).

Data that have been arranged and processed in such a way as to provide context and meaning that can aid in decision-making are referred to as information. Generally, users can make better decisions when

presented with a greater variety and quality of data. The factors that make the information helpful and consequential are presented in Table 1-1 below.

Table 1.1. Characteristics of Helpful Data

Characteristics	**Information**
Access restrained	Able to limit access to authorized stakeholders
Accurate	Free of error; accurately represent events
Available	Available to users when needed
Reputable	Seen as truthful and believable because of a reliable source
Complete	Does not exclude information about events or activities; of enough breadth and depth
Concise	The clear, suitable volume is presented briefly but broadly
Consistent	Presented in the same format over time
Current	Comprises up-to-the-minute information on past and contemporary happenings
Objective	equitable; neutral
Relevant	Eliminates unreliability; improves decision-making; relevant
Timely	Provided in time for decision-makers to make decisions
Useable	Easy to use for various tasks; human and machine-readable
Understandable	Organized in a way that is both useful and easy to understand, easily comprehended
Verifiable	Two independent, well-informed people generated the same information

When data is presented in a format that a computer can read and process, it is in its most useful form; this type of format is known as machine-readable (Xu, 2009). This processing may comprise collecting, recording, storing, updating, and broadcasting collected data. For instance, public corporations must now use XBRL (eXtensible Business Reporting Language) to encode their financial statements, a programming language created to improve the flow of financial and other business data. Without XBRL, digital documents are merely digital renditions of paper reports. Humans can read information, but computers can't understand it without being entered by hand. XBRL will alter that by encoding the meaning of data items so that other computers know what to do with them (Chen & Sun, 2009).

Many other 14 factors that make data useful are enhanced when presented in machine-readable formats like XBRL. For example, XBRL greatly enhances the following:

1. **Reliability.** It is achieved through reducing human error and implementing standard taxonomies. A relevant interpretation is given to the data so that it may be compared to similar data from other companies (Reyes et al., 2007).
2. **Accessibility.** Accessibility is achieved by facilitating automatic data importation into decision-making models and other computer systems (Taylor & Dzuranin, 2010).
3. **Continuity of service.** It is enhanced by shortening the time required to import, create, and disseminate information (Arnold & Sutton, 2001).

Data that is machine readable makes it easier to utilize more recent technologies such as data analytics and artificial intelligence, both of which will be covered further in this chapter.

However, there is a limit to the quantity of information that can be taken in and processed by the human mind. When certain boundaries are exceeded, information overload occurs, which leads to a decrease in the quality of decision-making and a rise in the cost of delivering that information. Information system designers use IT (information technology) to assist decision-makers in more efficient filtering and condensing of information. For instance, Walmart has made significant investments in information technology, enabling the company to collect and analyze approximately 50 petabytes of transaction records daily and analyze more than 200 internal and external databases for useful information (Feltham, 1968).

The value of information can be calculated by deducting the benefits gained from using the information from the expenses incurred in gathering the information. Information has several advantages, including reducing unpredictability, improving decision-making, and an enhanced capacity to organize tasks. The costs encompass the resources utilized throughout the content's production and dissemination. It can be challenging to estimate the costs and benefits of information, and it is even more challenging to determine the value of data before it has been

collected and put to use. However, the estimated value of the information should be computed as precisely as possible so that its expenses do not outweigh its advantages. This will ensure that the expenses do not outweigh the benefits (Templeton & Burney, 2017).

Consider the convenience store chain 7-Eleven as an example of how valuable knowledge can be. After acquiring a license from Southland Corporation to use the extremely popular 7-Eleven brand name, a Japanese company made significant investments in information technology. Every single 7-Eleven location in Japan was provided with a computer that was able to (Repo, 1989):

1. Record the 3,000 things sold in each store and determine which products were moving and under what weather circumstances they were moving.
2. Remember what customers buy and when they buy it so that it always has available supplies of the most frequently purchased items.
3. Automatically place orders for rice dishes and sandwiches with the various vendors. Orders were placed and fulfilled three times daily to ensure that stores always had access to fresh food. Suppliers could electronically access 7-Eleven's sales data to anticipate customer needs in a better way.
4. Work with the vendors to coordinate the delivery of goods. Because of this, the number of deliveries daily was cut from 34 to 12, resulting in less time spent on clerical receiving.
5. Create a full-color graphic display that identifies the store's sections that contributed the most to overall sales and profitability (Mock, 1971).

Learning Objectives

At the end of this chapter, readers will be able to:

1. Explain why information is more than just facts, what makes information valuable, and how to evaluate information.
2. Describe the main business processes found in most organizations and the information required to make choices within that organization.
3. Describe the value an AIS brings to a company, its interaction with corporate strategy, and its part in the value chain.
4. Understand the role and importance of accounting information systems in organizations.
5. Learn the basic components and architecture of an accounting information system.

6. Develop skills in identifying and analyzing business transactions and events for their impact on the organization's financial statements.
7. Learn the data flow and information flow process in an accounting information system.
8. Understand the concepts of internal control, risk management, and ethical considerations about accounting information systems.

Key Terms

1. Accounting
2. Accounting Information
3. Accounting Information Systems
4. Artificial intelligence
5. Data Analysis
6. Value Chain
7. Cloud Computing
8. Blockchain
9. Business Process
10. Transaction Cycle

1.1. Information Needs and Business Processes

All organizations require data so that they can make sound decisions. Furthermore, all organizations are constantly engaged in certain business processes. A business process is a collection of relevant, synchronized, and well-organized tasks and activities carried out by a person or a computer to achieve a specific organizational target (Chan, 2000).

Organizations must choose the decisions they must make, the information they need to make the decisions, and the best methods for collecting and processing the data necessary to produce the information if they are to make the best decisions. This data collection and processing is linked to an organization's basic business processes (Malhotra, 2005).

Tip: QuickBooks and Sage are two of the most popular accounting software programmes.

Figure 1.2. Diagram of the Components of an Information System (Source: Susan Gonzalez, Creative Commons License).

1.1. Information Needs

Scott and Susan decide they must first learn how S&S works to recognize the information they require to operate S&S. Then they can decide what data and methods will be required to gather and generate that information. Scott and Susan recognize that the list is not comprehensive. Still, they believe it provides a comprehensive summary of S&S. They know that S&S will not be able to meet all of the information needs mentioned in the right-hand column. Vendors, for example, will provide information on payment plans for merchandise purchases. As a result, S&S must successfully coordinate external data with self-generated data so that Scott and Susan can run S&S using both types of information (Wilson, 1981).

S&S will interact with external parties, including customers, government agencies, and internal parties, including management and employees. Figure 1.3 was created to help them understand the more significant interactions with these parties (Devadason & Lingam, 1997).

1.2. Business Processes

In order to better streamline the business operations, Scott decided to bundle similar transactions together. A transaction is any arrangement for exchanging goods between two parties or any other occurrence that an organization can value. Examples include paying employees, purchasing inventory from vendors, and selling products to clients. Transaction processing is the procedure that starts with the collection of transaction data and finishes with informational output (Giaglis, 2001).

Many commercial actions consist of two occurrences that trade one for the other. Most organizations participate in few give-get exchanges, yet each exchange occurs frequently. As an illustration, S&S will annually sell thousands of items to clients in return for cash. Similarly, S&S frequently purchases merchandise from vendors in exchange for money (Gebauer & Schober, 2006).

We may classify these interactions into five distinct transaction cycles:

i. **Revenue cycle**. In this cycle, services and goods are offered in exchange for cash or a commitment to pay cash in the future.

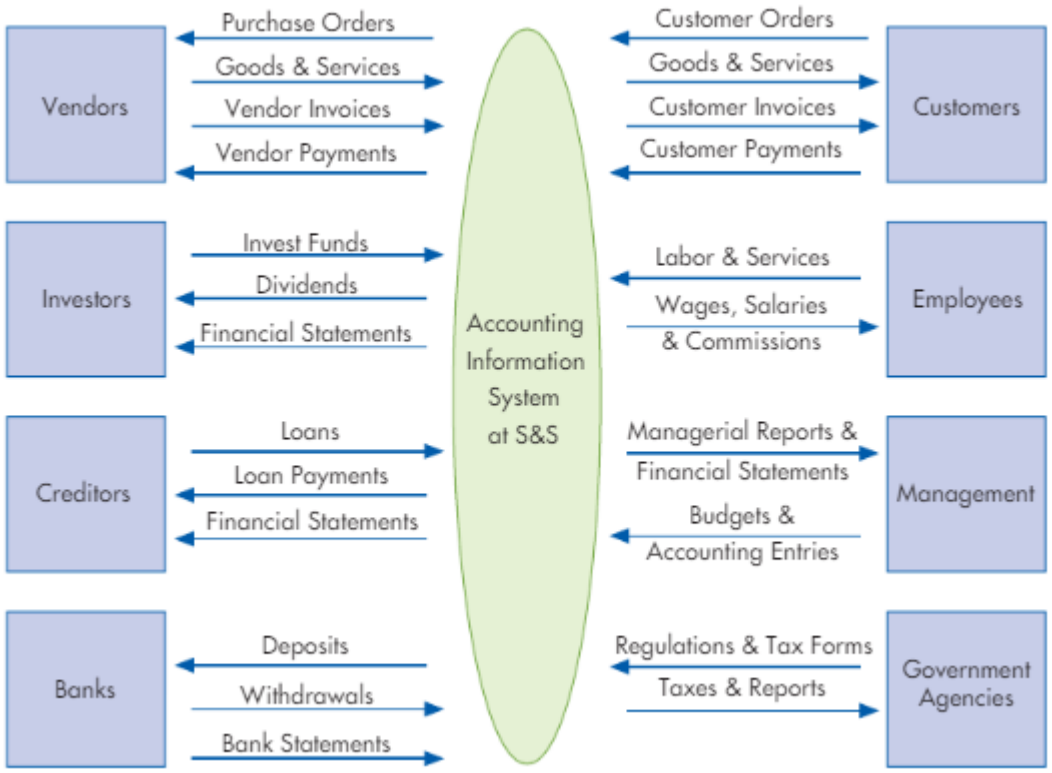

Figure 1.3. Schematic relationships between S&S and internal and external stakeholders (Source: Studocu.com, Creative Commons License).

ii. **Expenditure cycle.** In the expenditure cycle, businesses acquire stock for resale or raw materials for manufacturing goods in exchange for cash or the guarantee to pay cash in the future (Ritchi et al., 2022).

iii. **Production cycle.** The production cycle/conversion cycle transforms raw materials into finished goods.

iv. **Human resource cycle:** The human resources/payroll cycle includes hiring, training, evaluating, promoting, and abolishing employees (Lengnick & Moritz, 2003).

v. **Financing cycle:** In the financing cycle, companies sell stock to investors and make money, and investors receive dividends and interest on loans.

These cycles repeatedly carry out a small number of related transactions. For instance, most revenue cycle transactions include providing consumers with goods or services or receiving payment for those purchases. The key transaction cycles and the give-get trade that occurs in each cycle are depicted in Figure 1.4 (Dietz & Albani, 2005).

Several other economic operations complement these fundamental give-get exchanges. For instance, before S&S can close a deal, it might need to respond to various customer questions and assess the inventory. Similarly, it must assess consumer credit before making a credit sale. Every time a credit sale is made, accounts receivable must be increased, and every time a client payment is received, they must be decreased (Attaran, 2004).

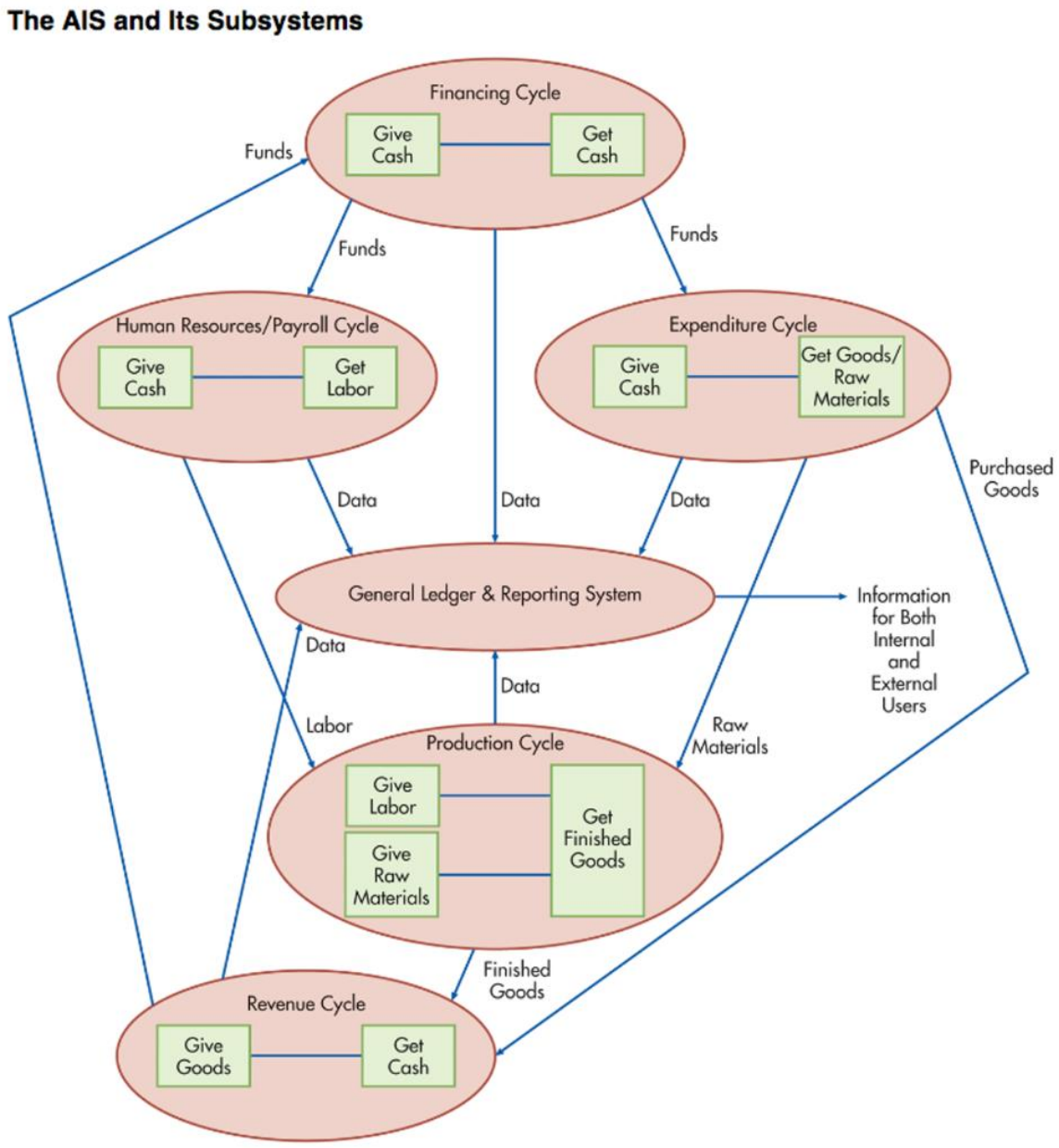

Figure 1.4. Illustration of the AIS and Its Subsystems (Source: Studocu.com, Creative Commons License).

Figure 1.4 depicts the relationships between these numerous transaction cycles and how they connect to the accounting records to produce data for management and outside parties.

Many accounting software programs represent the numerous transaction cycles as distinct modules. Every module does not have to be used by every company. For instance, retail establishments like S&S would not need that module without a production cycle. Additionally, some organizations have particular needs. Demand deposit and installment loan cycles are examples of financial institutions' cycles that pertain to activities involving customer accounts and loans (Davenport & Short, 1990).

Additionally, a given transaction cycle's characteristics vary depending on the type of organization. For instance, a legal firm does not execute transactions relating to purchasing, delivering, and paying goods that will be reissued to clients as part of their expenditure cycle. Each transaction cycle may consist of a variety of business operations or activities. Every business procedure may be extremely simple or complex (Grover et al., 1993).

In their opinion, Scott and Susan have sufficient knowledge of S&S to start looking for an information system. Susan thought back to a former workplace with several different information systems because the software was not created to meet the information requirements of all managers. She also remembered attending a meeting when she saw the drawbacks of having numerous systems (Galliers, 1993). The production manager had a report with different sales data, the controller's report, which was generated by the general ledger system, had a third version of year-to-date sales, and the head of marketing had one report on year-to-date sales by product. The time spent attempting to combine the many reports was almost an hour! Susan swore to make sure S&S was never in such a muddle again. For everyone to access information from the same system, she would ensure that any system chosen could merge financial and non-financial data regarding S&S's several business activities (Van et al., 1999).