# **INTRODUCTION TO ACCOUNTING INFORMATION SYSTEMS**

Information is a business resource. Like the other business resources of raw materials, capital, and labour, information is vital to the survival of the contemporary business organization. Every business day, vast quantities of information flow to decision makers and other users to meet a variety of internal needs. In addition, information flows out from the organization to external users, such as customers, suppliers, and stakeholders who have an interest in the firm. The figure below presents an overview of these internal and external information flows.

Day to day operations information

Budget Information & Instructions

Performance Information

Notice in the figure how information flows in two directions within the organization: horizontally and vertically. The horizontal flow supports operations-level tasks with highly detailed information about the many business transactions affecting the firm. This includes information about events such as the sale and shipment of goods, the use of labour and materials in the production process, and internal transfers of resources from one department to another. The vertical flow distributes information downward from senior managers to junior managers and operations personnel in the form of instructions, quotas, and budgets. In addition, summarized information pertaining to operations and other activities flows upward to managers at all levels. Management uses this information to support its various planning and control functions.

A third flow of information depicted in the figure represents exchanges between the organization and users in the external environment. External users fall into two groups: trading partners and stakeholders. Exchanges with trading partners include customer sales and billing information, purchase information for suppliers, and inventory receipts information. Stakeholders are entities outside (or inside) the organization with a direct or indirect interest in the firm. Stockholders, financial institutions, and government agencies are examples of external stakeholders. Information exchanges with these groups include financial statements, tax returns, and stock transaction information. Inside stakeholders include accountants and internal auditors.

**WHAT IS A SYSTEM?**

For many, the term system generates mental images of computers and programming. In fact, the term has much broader applicability. Some systems are naturally occurring, whereas others are artificial. Natural systems range from the atom—a system of electrons, protons, and neutrons—to the universe—a system of galaxies, stars, and planets. All life forms, plant and animal, are examples of natural systems. Artificial systems are man-made. These systems include everything from clocks to submarines and social systems to information systems.

**ELEMENTS OF A SYSTEM**

Regardless of their origin, all systems possess some common elements. To specify:

*A system is a group of two or more interrelated components or subsystems that serve a common purpose.*

Let’s analyze the general definition to gain an understanding of how it applies to businesses and information systems.

**MULTIPLE COMPONENTS.**

A system must contain more than one part. For example, a giraffe carved from a single piece of wood and attached to a string is a system. Without the string, it is not a system.

**RELATEDNESS.**

A common purpose relates the multiple parts of the system. Although each part functions independently of the others, all parts serve a common objective. If a particular component does not contribute to the common goal, then it is not part of the system. For instance, a pair of table tennis rackets and a volleyball net are both components; however, they lack a common purpose, and thus do not form a system.

**SYSTEM VERSUS SUBSYSTEM.**

The distinction between the terms system and subsystem is a matter of perspective. For our purposes, these terms are interchangeable. A system is called a subsystem when it is viewed in relation to the larger system of which it is a part. Likewise, a subsystem is called a system when it is the focus of attention. Animals, plants, and other life forms are systems. They are also subsystems of the ecosystem in which they exist. From a different perspective, animals are systems composed of many smaller subsystems, such as the circulatory subsystem and the respiratory subsystem.

**PURPOSE.**

A system must serve at least one purpose, but it may serve several. Whether a system provides a measure of time, electrical power, or information, serving a purpose is its fundamental justification. When a system ceases to serve a purpose, it should be replaced.

**SYSTEM DECOMPOSITION**.

Decomposition is the process of dividing the system into smaller subsystem parts. This is a convenient way of representing, viewing, and understanding the relationships among subsystems. By decomposing a system, we can present the overall system as a hierarchy and view the relationships between subordinate and higher-level subsystems. Each subordinate subsystem performs one or more specific functions to help achieve the overall objective of the higher-level system

**SUBSYSTEM INTERDEPENDENCY.**

A system’s ability to achieve its goal depends on the effective functioning and harmonious interaction of its subsystems. If a vital subsystem fails or becomes defective and can no longer meet its specific objective, the overall system will fail to meet its objective. For example, if the fuel pump (a vital subsystem of the fuel system) fails, then the fuel system fails. With the failure of the fuel system (a vital subsystem of the automobile), the entire system fails. On the other hand, when a non-vital subsystem fails, the primary objective of the overall system can still be met. For instance, if the radio (a subsystem of the electrical system) fails, the automobile can still carry passengers. Designers of all types of systems need to recognize the consequences of subsystem failure and provide the appropriate level of control. Like automobile designers, information system designers need to identify critical subsystems, anticipate the risk of their failure, and design cost-effective control procedures to mitigate that risk. Accountants play a major role here.

**AN INFORMATION SYSTEMS FRAMEWORK**

The information system is the set of formal procedures by which data are collected, processed into information, and distributed to users. For example, if we decompose the information system of a hypothetical manufacturing firm decomposed into its elemental subsystems, two broad classes of systems emerge from the decomposition: the accounting information system (AIS) and the management information system (MIS). We will use this framework to identify the domain of AIS and distinguish it from MIS. More often, MIS and AIS functions are integrated to achieve operational efficiency. The distinction between AIS and MIS centers on the concept of a transaction. The information system accepts input, called transactions, which are converted through various processes into output information that goes to users. Transactions fall into two classes: financial transactions and nonfinancial transactions. Before exploring this distinction, let’s first broadly define:

*A transaction as an event that affects or is of interest to the organization and is processed by its information system as a unit of work.*

This definition encompasses both financial and nonfinancial events. Because financial transactions are of particular importance to the accountant’s understanding of information systems, we need a precise definition for this class of transaction:

*A financial transaction is an economic event that affects the assets and equities of the organization, is reflected in its accounts, and is measured in monetary terms.*

Sales of products to customers, purchases of inventory from vendors, and cash disbursements and receipts are examples of financial transactions. Every business organization is legally bound to correctly process these types of transactions.

Nonfinancial transactions are events that do not meet the narrow definition of a financial transaction.

For example, adding a new supplier of raw materials to the list of valid suppliers is an event that may be processed by the enterprise’s information system as a transaction. Important as this information obviously is, it is not a financial transaction, and the firm has no legal obligation to process it correctly—or at all. Financial transactions and nonfinancial transactions are closely related and are often processed by the same physical system. For example, consider a financial portfolio management system that collects and tracks stock prices (nonfinancial transactions). When the stocks reach a threshold price, the system places an automatic buy or sell order (financial transaction). Buying high and selling low is not against the law, but it is bad for business. Nevertheless, no law requires company management to design optimal buy and- sell rules into their system. Once the buy-or-sell order is placed, however, the processing of this financial transaction must comply with legal and professional guidelines.

**THE ACCOUNTING INFORMATION SYSTEM**

AIS subsystems process financial transactions and nonfinancial transactions that directly affect the processing of financial transactions. For example, changes to customers’ names and addresses are processed by the AIS to keep the customer file current. Although not technically financial transactions, these changes provide vital information for processing future sales to the customer.

The AIS is composed of three major subsystems: (1) the transaction processing system (TPS), which supports daily business operations with numerous reports, documents, and messages for users throughout the organization; (2) the general ledger/financial reporting system (GL/FRS), which produces the traditional financial statements, such as the income statement, balance sheet, statement of cash flows, tax returns, and other reports required by law; and (3) the management reporting system (MRS), which provides internal management with special-purpose financial reports and information needed for decision making such as budgets, variance reports, and responsibility reports.

**THE MANAGEMENT INFORMATION SYSTEM**

Management often requires information that goes beyond the capability of AIS. As organizations grow in size and complexity, specialized functional areas emerge, requiring additional information for production planning and control, sales forecasting, inventory warehouse planning, market research, and so on. The management information system (MIS) processes nonfinancial transactions that are not normally processed by traditional AIS

**Why Is It Important to Distinguish between AIS and MIS?**

Legislation requires that management design and implement internal controls over the entire financial reporting process. This includes the financial reporting system, the general ledger system, and the transaction processing systems that supply the data for financial reporting. The law further requires that management certify these controls and that the external auditors express an opinion on control effectiveness. Because of the highly integrative nature of modern information systems, management and auditors need a conceptual view of the information system that distinguishes key processes and areas of risk and legal responsibility from the other (nonlegally binding) aspects of the system. Without such a model, critical management and audit responsibilities under SOX may not be met.

**AIS SUBSYSTEMS**

We devote separate chapters to an in-depth study of each AIS subsystem depicted in Figure 1-3. At this point, we briefly outline the role of each subsystem.

**Transaction Processing System**

The TPS is central to the overall function of the information system by converting economic events into financial transactions, recording financial transactions in the accounting records (journals and ledgers), and distributing essential financial information to operations personnel to support their daily operations. The TPS deals with business events that occur frequently. In a given day, a firm may process thousands of transactions. To deal efficiently with such volume, similar types of transactions are grouped together into transaction cycles. The TPS consists of three transaction cycles: the revenue cycle, the expenditure cycle, and the conversion cycle. Each cycle captures and processes different types of financial transactions.

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**General Ledger/Financial Reporting Systems**

The general ledger system (GLS) and the financial reporting system (FRS) are two closely related subsystems. However, because of their operational interdependency, they are generally viewed as a single integrated system—the GL/FRS. The bulk of the input to the GL portion of the system comes from the transaction cycles. Summaries of transaction cycle activity are processed by the GLS to update the general ledger control accounts. Other, less frequent, events such as stock transactions, mergers, and lawsuit settlements, for which there may be no formal processing cycle in place, also enter the GLS through alternate sources. The FRS measures and reports the status of financial resources and the changes in those resources. The FRS communicates this information primarily to external users. This type of reporting is called nondiscretionary because the organization has few or no choices in the information it provides. Much of this information consists of traditional financial statements, tax returns, and other legal documents.

**Management Reporting System**

The MRS provides the internal financial information needed to manage a business. Managers must deal immediately with many day-to-day business problems, as well as plan and control their operations. Managers require different information for the various kinds of decisions they must make. Typical reports produced by the MRS include budgets, variance reports, cost-volume-profit analyses, and reports using current (rather than historical) cost data. This type of reporting is called discretionary reporting because the organization can choose what information to report and how to present it.

A GENERAL MODEL FOR AIS

There is a general model that describes all information systems, regardless of their technological architecture. The elements of the general model are end users, data sources, data collection, data processing, database management, information generation, and feedback. Please review this and identify examples of each.