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Foundations of

Information Systems

1 Fundamentals of Information Systems

Figure 1.1 Information systems are an integral part of our lives. Organizations rely on them to manage data, produce goods and services, and compete successfully in marketplaces big and small. (credit: modification of work “Infoeko2” by “Deeply”/Wikimedia Commons, CC0 1.0)

Chapter Outline

Introduction

What comes to mind when you think about information systems? In what ways do you think they affect your life? You might be surprised to find out that information systems have an impact on your life and career whether you realize it or not.

In general, an information system is a set of components that helps gather, analyze, maintain, and distribute data. The components of information systems include people, the system’s hardware and software, networks, data, and the procedures used to process the data and maintain the system.

The fields of information systems (IS) and information technology (IT) overlap, and sometimes the terms are used interchangeably. However, the sole focus of the field of IT is technology, meaning the processes necessary to establish and maintain computer systems, networks, and applications. Although the field of IS is concerned with technology, the focus is broader to include the people who are part of system processes. It is a vital tool used by all types of organizations to conduct business and participate in the marketplace, whether local or global.

helpful information about IS careers, including the general skills required, types of organizations that hire IS professionals, and what students can expect if they pursue a career in IS.

Types of Information Systems

As shown in Figure 1.3, information systems can be categorized into different types based on their scope and functionality. Executive information systems are used by an organization's executive staff, decision support systems are used by senior managers, management information systems are used by middle managers, and transaction processing systems are used by frontline workers.

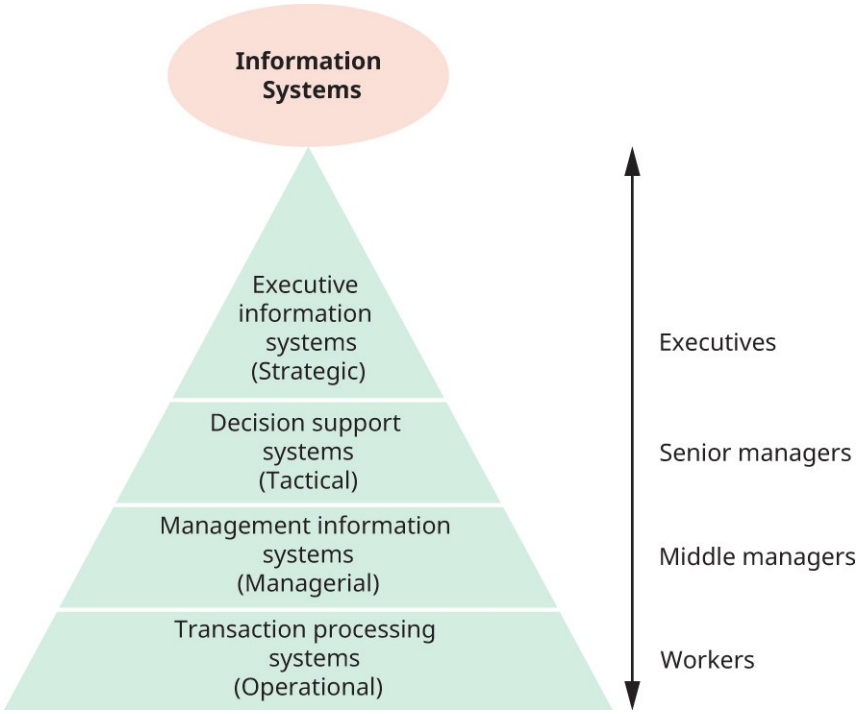

Figure 1.3 Information systems include several types of systems with distinct purposes. (credit: modification of work from Introduction to Computer Science attribution: Copyright Rice University, OpenStax, under CC BY 4.0 license)

Let us take a closer look at each type of information system and explore their purposes.

- An **executive information system (EIS)** supports the strategic information needs of top executives, providing the information needed to handle executive functions, such as developing an organization's strategic goals and objectives and plans for achieving them. This includes providing the information needed for managers to understand and manage their organization's supply chain and value chain, which can be helpful to streamline production processes and provide better customer service. Supply chain management is an example of how an EIS can be used as an interorganizational information system, which occurs when two or more organizations use IS to conduct business electronically.
- A **decision support system (DSS)** assists in decision-making by providing interactive tools and access to data analysis. Typically, senior managers use a DSS to obtain tactical information that helps them make routine, short-term decisions about an organization's operations. This helps ensure that organizations stay on track to achieve long-term goals and objectives. Interactive tools available through a DSS enhance these efforts by providing information and technology needed for activities such as project management and employee training.
- A **management information system (MIS)** provides middle managers with reports and summaries to support decision-making and managerial functions. For example, middle managers may use an MIS to generate reports, such as budgeting documents and cash flow statements, to understand an

organization's financial status. In many organizations, this type of system provides the data for an organization's balanced scorecard (BSC), which is a performance metric used by strategic managers to identify an organization's various functions and monitor outcomes. By providing the data necessary for the BSC, an organization's MIS function provides invaluable support.

- A **transaction processing system (TPS)** handles day-to-day transactions, such as order processing and payroll. For frontline staff, a TPS provides information necessary to handle an organization's daily operations, such as inventory reports and customer service records.

In addition to these four types of information systems, an **enterprise resource planning (ERP) system** is a software system that helps an organization manage various types of information systems within the organization, and integrate business processes and functions across the organization. For example, large organizations may rely on an ERP system to handle human resource management throughout the organization. An ERP is also a useful tool for functions such as project management, accounting and financial management including payroll, and tracking customer service.

Application of Information Systems in Business

Think about a visit to a coffee shop, from ordering to receiving the order, through the lens of IS. First, think about how a barista takes an order at the register. That's the point-of-sale (POS) system at work. The POS system is an information system that streamlines transactions, helping businesses track sales, manage inventory, and even understand customer preferences when tracked with tools such as customer loyalty cards. When a customer switches from their regular black coffee to a caramel macchiato, the system takes note and updates their preferences, contributing to a personalized customer experience.

Now, imagine if the coffee shop had no system to track sales, manage its supplies, and keep track of customer preferences. What do you think might be some of the challenges a business would face if they did not have a way to gather, track, and analyze this data? This is where ERP systems come into play. ERP systems integrate various business processes, ensuring that everything from bean procurement to milk deliveries is synchronized. This not only prevents the coffee shop from running out of their most popular blend, but also helps them manage costs and operate more efficiently.

The POS and ERP systems are not the only information systems in a coffee shop. Most coffee shops have Wi-Fi, which is another information system that includes hardware, software, and the networks that connect them. The coffee shop's Wi-Fi is a small-scale example of how businesses use IS to stay ahead of the competition, whether it be locally, nationally, or globally.

In essence, information systems are about more than simply computers and gadgets. They are the invisible architects that shape our daily experiences, whether we're grabbing a coffee or navigating the complexities of a global market.

CAREERS IN IS

Careers in IS

Students who are interested in the field of IS have a variety of career options. There are technical jobs that require in-depth knowledge of computers, such as software developers who design, create, and test the software applications necessary to develop and maintain an information system. Cloud computing engineers also fall into this category, and they must have the skills to guide and support organizations as they connect their systems to the cloud and use it to conduct business.

But not all IS jobs are technical. Students who find the field intriguing but want a less technical job also have career options. For example, systems analysts explore an organization's operations to identify areas where technology can be used to help an organization be more efficient and cost-effective. Information