LEARNING OUTCOMES

After reading this chapter, you will be able to

- LO 1.1 Know the fundamental roles in business
- LO 1.2 Understand the trends in information systems
- LO 1.3 Assess the role of e-business in business
- LO 1.4 Know the types of information systems
- LO 1.5 Gauge the managerial challenges of information technology

INTRODUCTION

The question of why we need to study information systems and information technology has evolved into a moot issue. Information systems have become as integrated into our daily business activities as accounting, finance, operations management, marketing, human resource management, or any other major business function. Information systems and technologies are vital components of successful businesses and organizations—some would say they are business imperatives. They thus constitute an essential field of study in business administration and management, which is why most business majors include a course in information systems. Since you probably intend to be a manager, entrepreneur, or business professional, it is just as important to have a basic understanding of information systems as it is to understand any other functional area in business.

Information technologies, including Internet-based information systems, are playing vital and expanding roles in business. Information technology can help all kinds of businesses improve the efficiency and effectiveness of their business processes, managerial decision making, and workgroup collaboration, which strengthens their competitive positions in rapidly changing marketplaces. This benefit occurs irrespective of whether the information technology is used to support product development teams, customer support processes, e-commerce transactions, or any other business activity. Information technologies and systems are, quite simply, an essential ingredient for business success in today’s dynamic global environment.

THE FUNDAMENTAL ROLES OF IS IN BUSINESS

Although there are a seemingly endless number of software applications, there are three fundamental reasons for all business applications of information technology. They are found in the three vital roles that information systems can perform for a business enterprise:
Figure 1.1 illustrates how the fundamental roles interact in a typical organization. At any moment, information systems designed to support business processes and operations may also be providing data to, or accepting data from, systems focused on business decision making or achieving competitive advantage. The same is true for the other two fundamental roles of IS. Today’s organizations are constantly striving to achieve integration of their systems to allow information to flow freely through them, which adds even greater flexibility and business support than any of the individual system roles could provide.

Let’s look at a typical retail store as a good example of how these roles of IS in business can be implemented.

**IT Adoption in Indian Construction Sector**

Initially slow in the adoption of technology, the Indian construction sector’s IT adoption picked up pace in the last decade. The early resistance to IT adoption was a result of ignorance, but with the construction industry going global, there was a need to introduce efficiency and productivity in business processes. The growth in infrastructure projects is one of the leading drivers in the construction industry, providing necessary spurt to the IT adoption curve in the vertical.

The increased government spending on large-scale infrastructure projects is another reason contributing to the growth. Until six to eight years back, the government spending was only about 2 per cent of the GDP, which has now gone up to around 5 per cent. This figure is likely to go further up, as India looks to catch up with China.

The construction industry is broadly categorized into two segments—builders engaged in the construction of residential and commercial buildings; and infrastructure (bridges, dams, roads, highways) construction players. In addition, the sub-segments include contractors for the above two segments, and niche service providers who specialize in specific areas like waterproofing, industrial flooring, tunnel repair, rehabilitation of old buildings, expansion joints, etc.

With the entry of new players in the sector, the competition has taken a turn since these new players come with no legacy systems and new processes. The projects undertaken are on a bigger scale from residential projects, townships, to shopping malls.
However, as the competition is getting aggressive, the older companies, too, are getting bigger by the day and are bracing up for the competition. With the government allowing FDI in the sector, foreign players are also entering the fray. This, in turn, is putting pressure on the companies to improve operational efficiencies. With the growth, companies today are handling as much as around sixty to seventy projects simultaneously as compared to around ten to twelve simultaneous projects till about a few years back. This apart, the value of the projects has also increased substantially with the ever-increasing pressure to reduce the cycle time and costs, as well as greater strictness to deliver the projects on time.

The business dynamics have changed; there are various models now—the PPP model, BOT, and EPC model. Therefore, the only way to work efficiently at such a large-scale is to have strong operational systems in place that take care of everything—from procurement to financials to timely project execution. Sometime back, most companies were using basic IT. Over the last few years, there has been an increase in the uptake of world-class IT solutions by this segment as they reap the benefits of computing, project management, and collaboration technologies.

**Solutions on the Platter**

Like the global giants which have been using various IT solutions for improving operational efficiencies, the Indian counterparts are also now deploying IT solutions for growth. With smaller players becoming professionally managed companies, they have had to adopt technology in various areas of business.

Moving on from home-grown solutions to islands of computerization, the adoption of IT in the construction sector is now moving to deployment of standard ERP systems.

The move towards the adoption of integrated solutions has come about due to the combination of several factors such as the need for tighter control over operations, quality compliance in execution, global business practices due to global expansions, MNCs entering in to joint ventures with Indian corporates, and streamlining operations as a prerequisite norm before going for public funding like IPOs.

The ERP solution can be categorized into contractor suite and builder suite. The contractor suite includes pre- and post-tender estimation, labor management, purchase and inventory management, billing and MIS based solutions. On the other hand, the builder suite has features such as estimation and costing, client management, billing and site management.

Apart from deployment of ERP, there are specialized engineering solutions such as geotechnical, structural, mechanical, transportational, hydraulic, environmental, land surveying, etc. These solutions have enabled the civil engineers to construct durable, aesthetically pleasing, higher functional and user-friendly structures which are economical and time-saving.

Besides, work is on to develop solutions for structural analysis to increasing the lifespan of buildings and protect them from calamities. New systems are being adopted in infrastructure development, civil engineering and management of projects to enable the construction sector to perform better.

Construction professionals engaged in designing of architecture, engineering designs, detailing, estimation, tendering and procurement of materials and project management have the solution at their fingertips which was not possible through traditional methodologies.

There is an increasing focus on the integration of sales, inventory, finance, procurement, costing, and integration with other project management tools. Therefore, the focus is now on consolidation across locations, projects, MIS, and a complete WAN in the construction segment.

Most of the processes like financials, HR, legal, and construction process are IT-enabled. Technology is also being used for land bank management, sales, and after-sales processing. Project management, however, is becoming a big focus area keeping in mind the sheer size of the projects being undertaken by the companies. The growing size and volume of the projects are also making it difficult for companies to manage their data. As a result, they are also looking for IT solutions that enable them to manage their vast data in order to increase efficiency, reduce procurement costs and wastage, boost productivity, and thereby, cut project execution time.
There's nothing called an IT hole in this era. Many bolts from the blue can borrow up to the CIO even if s/he thinks that IT is cocooned under the surface.

Things that are seemingly alien or not directly connected sometimes have a profound and continuing impact on the very way IT is bought, consumed or managed. A small change at a place in a deterministic nonlinear system has probably resulted in large differences to a later state called IT spending in past few years in this universe as well. Before we meet some of these winged species, a quick jog at how IT spends look like today—where and how much.

But what might be really interesting to note first is that, at one point Gartner did revise its global IT spending forecast for 2012 from 4.6 per cent to 3.7 per cent owing to factors such as global economic slowdown, the Eurozone crisis and floods in Thailand. Ripple effects happen after all, as we are about to argue.

Taking a leaf from Gartner’s prognosis, one can assume that worldwide enterprise IT spending can touch $2.679 trillion in 2013, a 2.5 per cent increase of projected 2012 spending of $2.603 trillion. With 1.2 billion people on social networks, 20 per cent of the world’s population, social computing is in its next phase as has been added in the forecast. It has been strongly advised that IT leaders must immediately incorporate social software capabilities throughout their enterprise systems.

Another big shift would be that of mobility wherein, by 2016, 900 million media tablets will be purchased—one for every eight people on earth. By 2014, the installed base of devices based on lightweight mobile operating systems, such as Apple’s iOS, Google’s Android, and Microsoft’s Windows 8 will exceed the total installed base of all PC-based systems. Also, by 2014, private app stores might be deployed by 60 per cent of IT organizations, and more than that the applications themselves will be redesigned—they will become context-enabled, understanding the user’s intent automatically.

Mobility and wireless infrastructure displayed acceleration too. Many organizations (91 per cent) were found expecting to spend on mobile devices in 2012, while wireless equipment expenditures beeped an average year-on-year budget growth of 14.4 per cent. Also worth noting—Mobile apps accounted for an average of nine per cent of business-application spending in large enterprises and similar up ticks were spotted in areas such as rights management or identity management. There’s more that is running in the undercurrents in IT spends—from telepresence to work-from-home systems to super-powerful clusters, there are so many ripples that have triggered silent but huge waves.

The “Big Five” IT trends of the current half decade: Mobile, social, cloud, consumerization, and big data.

Source: Adapted from http://www.ciol.com/ciol/features/155131/top-it-ripples-changed-it Features | by Pratima H
TRENDS IN INFORMATION SYSTEMS

The business applications of information systems have expanded significantly over the years. Figure 1.2 summarizes these changes.

Until the 1960s, the role of most information systems was simple: transaction processing, record keeping, accounting, and other electronic data processing (EDP) applications. Then another role was added, namely, the processing of all these data into useful, informative reports. Thus, the concept of management information systems (MIS) was born. This new role focused on developing business applications that provided managerial end users with predefined management reports that would give managers the information they needed for decision-making purposes.

By the 1970s, it was evident that the prespecified information products produced by such management information systems were not adequately meeting the decision-making needs of management, so the concept of decision support systems (DSS) was born. The new role for information systems was to provide managerial end users with ad hoc, interactive support of their decision-making processes. This support would be tailored to the unique decisions and decision-making styles of managers as they confronted specific types of problems in the real world.

Figure 1.2 The expanding roles of the business applications of information systems. Note how the roles of computer-based information systems have expanded over time. Also, note the impact of these changes on the end users and managers of an organization.
In the 1980s, several new roles for information systems appeared. First, the rapid development of microcomputer processing power, application software packages, and telecommunications networks gave birth to the phenomenon of end-user computing. End users could now use their own computing resources to support their job requirements instead of waiting for the indirect support of centralized corporate information services departments.

Second, it became evident that most top corporate executives did not directly use either the reports of management information systems or the analytical modeling capabilities of decision support systems, so the concept of executive information systems (EIS) developed. These information systems were created to give top executives an easy way to get the critical information they wanted, when they wanted it, and tailored to the formats they preferred.

Third, breakthroughs occurred in the development and application of artificial intelligence (AI) techniques to business information systems. Today’s systems include intelligent software agents that can be programmed and deployed inside a system to act on behalf of their owner, system functions that can adapt themselves on the basis of the immediate needs of the user, virtual reality applications, advanced robotics, natural language processing, and a variety of applications for which artificial intelligence can replace the need for human intervention, thus freeing up knowledge workers for more complex tasks. Expert systems (ES) and other knowledge-based systems also forged a new role for information systems. Today, expert systems can serve as consultants to users by providing expert advice in limited subject areas.

An important new role for information systems appeared in the 1980s and continued through the 1990s: the concept of a strategic role for information systems, sometimes called strategic information systems (SIS). In this concept, information technology becomes an integral component of business processes, products, and services that help a company gain a competitive advantage in the global marketplace.

The mid- to late 1990s saw the revolutionary emergence of enterprise resource planning (ERP) systems. This organization-specific form of a strategic information system integrates all facets of a firm, including its planning, manufacturing, sales, resource management, customer relations, inventory control, order tracking, financial management, human resources, and marketing—virtually every business function. The primary advantage of these ERP systems lies in their common interface for all computer-based organizational functions and their tight integration and data sharing, necessary for flexible strategic decision making.

We are also entering an era where a fundamental role for IS is business intelligence (BI). BI refers to all applications and technologies in the organization that are focused on the gathering and analysis of data and information that can be used to drive strategic business decisions. Through the use of BI technologies and processes, organizations can gain valuable insight into the key elements and factors—both internal and external—that affect their business and competitiveness in the marketplace. BI relies on sophisticated metrics and analytics to “see into the data” and find relationships and opportunities that can be turned into profits.

Finally, the rapid growth of the Internet, intranets, extranets, and other interconnected global networks in the 1990s dramatically changed the capabilities of information systems in business at the beginning of the 21st century. Further, a fundamental shift in the role of information systems occurred. Internet-based and Web-enabled enterprises and global e-business and e-commerce systems are becoming commonplace in the operations and management of today’s business enterprises. Information systems is now solidly entrenched as a strategic resource in the modern organization.

A closer look at Figure 1.2 suggests that though we have expanded our abilities with regard to using information systems for conducting business, today’s information systems are still doing the same basic things that they began doing more than 50 years ago. We still need to process transactions, keep records, provide management with useful and informative reports, and support the foundational accounting systems and processes of the organization. What has changed, however, is that we now enjoy a much higher level of integration of system functions across applications, greater connectivity across both similar and dissimilar system components, and the ability to reallocate critical computing tasks such as data storage, processing, and presentation to take maximum advantage of business and strategic opportunities. Because of these increased capabilities, the systems of tomorrow will be focused on increasing both the speed and reach of our systems to provide even tighter integration, combined with greater flexibility.
THE ROLE OF e-BUSINESS IN BUSINESS

The Internet and related technologies and applications have changed the ways businesses operate and people work, as well as how information systems support business processes, decision making, and competitive advantage. Thus, many businesses today are using Internet technologies to Web-enable their business processes and create innovative e-business applications. See Figure 1.3.

The Internet

Extranets

Suppliers and Other Business Partners

Company Boundary

Intranets

Amazon

Amazon

Supply chain management:
Procurement, distribution, and logistics

Engineering and research

Extranets

Manufacturing and production

Accounting and finance

Extranets

Customer relationship management:
Marketing, Sales, Customer service

Extranets

Consumers and Business Customers

Figure 1.3 Businesses today depend on the Internet, intranets, and extranets to implement and manage innovative e-business applications.

In this text, we define e-business as the use of Internet technologies to work and empower business processes, e-commerce, and enterprise collaboration within a company and with its customers, suppliers, and other business stakeholders. In essence, e-business can be more generally considered an online exchange of value. Any online exchange of information, money, resources, services, or any combination thereof falls under the e-business umbrella. The Internet and Internet-like networks—those inside the enterprise (intranet) and between an enterprise and its trading partners (extranet)—have become the primary information technology infrastructure that supports the e-business applications of many companies. These companies rely on e-business applications to (1) reengineer internal business processes, (2) implement e-commerce systems with their customers and suppliers, and (3) promote enterprise collaboration among business teams and workgroups.

Enterprise collaboration systems involve the use of software tools to support communication, coordination, and collaboration among the members of networked teams and workgroups. A business may use intranets, the Internet, extranets, and other networks to implement such systems. For example, employees and external consultants may form a virtual team that uses a corporate intranet and the Internet for e-mail, videoconferencing, e-discussion groups, and Web pages of work-in-progress information to collaborate on business projects.
e-commerce is the buying, selling, marketing, and servicing of products, services, and information over a variety of computer networks. Many businesses now use the Internet, intranets, extranets, and other networks to support every step of the commercial process, including everything from advertising, sales, and customer support on the World Wide Web to Internet security and payment mechanisms that ensure completion of delivery and payment processes. For example, e-commerce systems include Internet Web sites for online sales, extranet access to inventory databases by large customers, and the use of corporate intranets by sales reps to access customer records for customer relationship management.

TYPES OF INFORMATION SYSTEMS

Conceptually, the applications of information systems that are implemented in today’s business world can be classified in several different ways. For example, several types of information systems can be classified as either operations or management information systems. Figure 1.4 illustrates this conceptual classification of information systems applications. Information systems are categorized this way to spotlight the major roles each plays in the operations and management of a business. Let’s look briefly at some examples of such information systems categories.

Figure 1.4 Operations and management classifications of information systems. Note how this conceptual overview emphasizes the main purposes of information systems that support business operations and managerial decision making.

Operations Support Systems

Information systems have always been needed to process data generated by, and used in, business operations. Such operations support systems produce a variety of information products for internal and external use; however, they do not emphasize the specific information products that can best be used by managers. Further processing by management information systems is usually required. The role of a business firm’s operations support systems is to process business transactions, control industrial processes, support enterprise communications and collaborations, and update corporate databases efficiently. See Figure 1.5.

Transaction processing systems are important examples of operations support systems that record and process the data resulting from business transactions. They process transactions in two basic ways. In batch processing, transactions data are accumulated over a period of time and processed periodically. In real-time (or online) processing, data are processed immediately after a transaction occurs. For example, point-of-sale (POS) systems at many retail stores use electronic
Figure 1.5  A summary of operations support systems with examples.

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<tr>
<th>Operations Support Systems</th>
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<tbody>
<tr>
<td><strong>Transaction processing systems.</strong> Process data resulting from business transactions, update operational databases, and produce business documents. Examples: sales and inventory processing and accounting systems.</td>
</tr>
<tr>
<td><strong>Process control systems.</strong> Monitor and control industrial processes. Examples: petroleum refining, power generation, and steel production systems.</td>
</tr>
<tr>
<td><strong>Enterprise collaboration systems.</strong> Support team, workgroup, and enterprise communications and collaborations. Examples: e-mail, chat, and videoconferencing groupware systems.</td>
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Cash register terminals to capture and transmit sales data electronically over telecommunications links to regional computer centers for immediate (real-time) or nightly (batch) processing. Figure 1.6 is an example of software that automates accounting transaction processing.

Figure 1.6  QuickBooks is a popular accounting package that automates small office or home office (SOHO) accounting transaction processing while providing business owners with management reports.

*Source: Courtesy of Quickbooks.*

Process control systems monitor and control physical processes. For example, a petroleum refinery uses electronic sensors linked to computers to monitor chemical processes continually and make instant (real-time) adjustments that control the refinery process. Enterprise collaboration systems enhance team and workgroup communications and productivity and include applications that are sometimes called office automation systems. For example, knowledge workers in a project team may use e-mail to send and receive e-messages or use videoconferencing to hold electronic meetings to coordinate their activities.

Management Support Systems

When information system applications focus on providing information and support for effective decision making by managers, they are called management support systems. Providing information and support for decision making by all types of managers and business professionals is a complex task. Conceptually, several major types of information systems support a variety of decision-making responsibilities: (1) management information systems, (2) decision support systems, and (3) executive information systems. See Figure 1.7.

Management information systems (MIS) provide information in the form of reports and displays to managers and many business professionals. For example, sales managers may use their...
Figure 1.7  A summary of management support systems with examples.

<table>
<thead>
<tr>
<th>Management Support Systems</th>
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</thead>
<tbody>
<tr>
<td><strong>Management information systems.</strong> Provide information in the form of prespecified reports and displays to support business decision making. Examples: sales analysis, production performance, and cost trend reporting systems.</td>
</tr>
<tr>
<td><strong>Decision support systems.</strong> Provide interactive ad hoc support for the decision-making processes of managers and other business professionals. Examples: product pricing, profitability forecasting, and risk analysis systems.</td>
</tr>
<tr>
<td><strong>Executive information systems.</strong> Provide critical information from MIS, DSS, and other sources tailored to the information needs of executives. Examples: systems for easy access to analyses of business performance, actions of competitors, and economic developments to support strategic planning.</td>
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</tbody>
</table>

networked computers and Web browsers to receive instantaneous displays about the sales results of their products and access their corporate intranet for daily sales analysis reports that evaluate sales made by each salesperson. **Decision support systems** (DSS) give direct computer support to managers during the decision-making process. For example, an advertising manager may use a DSS to perform a what-if analysis as part of the decision to determine how to spend advertising dollars. A production manager may use a DSS to decide how much product to manufacture, based on the expected sales associated with a future promotion and the location and availability of the raw materials necessary to manufacture the product. **Executive information systems** (EIS) provide critical information from a wide variety of internal and external sources in easy-to-use displays to executives and managers. For example, top executives may use touch-screen terminals to view instantly text and graphics displays that highlight key areas of organizational and competitive performance. Figure 1.8 is an example of an MIS report display.

Figure 1.8  Management information systems provide information to business professionals in a variety of easy-to-use formats.

Source: Courtesy of Infor.
**Managerial Challenges of Information Technology**

Figure 1.9 illustrates the scope of the challenges and opportunities facing business managers and professionals in effectively managing information systems and technologies. Success in today’s dynamic business environment depends heavily on maximizing the use of Internet-based technologies and Web-enabled information systems to meet the competitive requirements of customers, suppliers, and other business partners in a global marketplace. Figure 1.9 also emphasizes that information systems and their technologies must be managed to support the business strategies, business processes, and organizational structures and culture of a business enterprise. That is because computer-based information systems, though heavily dependent on information technologies, are designed, operated, and used by people in a variety of organizational settings and business environments. The goal of many companies today is to maximize their customer and business value by using information technology to help their employees implement cooperative business processes with customers, suppliers, and others.

**Spark Batteries Ltd.**

Spark Batteries Ltd. (SBL) is a leading alternative energy solution provider that give services to various companies in North India and households in NCR region. SBL supplies Generators, Invertors, Batteries, and spare parts required for these product lines. Spark Batteries has 30 sales-cum-service offices in North India. SBL also has a major service workshop based in Mayapuri Industrial Area of west Delhi. All major service requests are processed and maintained in the service workshop. SBL service workshop provides two kinds of services—one, a preventive-cum-routine maintenance and second, on call basis. SBL tries to offer an uptime of 98 percent for most of its products that are covered under preventive maintenance scheme. SBL also offers a warranty of one month on all call basis repairs.

The customers who have SBL products are quite happy, but the services offered are not as per claims. SBL has a large workforce of 100 employees at its service workshop who handle, on an average, about 300 complaints on daily basis. Because of a large number of service requirements, they need to maintain a large amount of inventory of spares.

The basic challenge that Spark Batteries Ltd. is facing is to manage the spare parts inventory and to keep the service schedule for better customer satisfaction. This requires the replacements of the critical spares, testing of the various systems, regular servicing, etc. From, the items received at the service workshop, it was found that
most of the items were not serviced properly during the preventive maintenance stage and, as a result, it led to load increase at the service workshop.

SBL maintains a manual card based system to keep track of services being performed. It records the basic information about the product and customer in the service card like, the model, the type, the customer name and address and the last service done, etc. It also tries to maintain the history of the services carried out on the product for future planning.

SBL also wants to use the card data for preventive maintenance, but that is not happening as these cards are available only at service workshop. Some of the customers also request for similar kind of information for getting their generators/invertors serviced on time. For invertors, the battery is an important component and one needs to maintain it properly with appropriate water levels. For SBL, battery sales is a major source of revenue.

Preventive maintenance is mostly handled by the sales offices. Each sales office has at least one service engineer. Service Engineer maintains his own record of preventive calls. There is no check about the preventive process at the central level. Whether it is done for all customers on regular intervals or not? If it is not being done by the service engineer based at the sales location, customers had to register a complaint only at the service workshop.

For complaints received at the service workshop, the following procedure is being followed by Spark Batteries Ltd.:

Each complaint is recorded by the service support executive based at the workshop. A complaint number is generated and is informed to the customer. The customer is requested to bring in his equipment for necessary service as per the pre-defined date and time. When the customer brings in his equipment at Spark Batteries service workshop, the Service Manager opens the job card as per the pre-registered complaint number. After necessary verification of the equipment, an estimate is given to the customer with expected time of delivery. The job card is then handed over to the service department concerned for necessary repair/replacement of parts.

At each of the Service departments, after the necessary work is completed, a delivery note is written with the complaint number mentioning the tasks carried out in terms of the parts replaced, manpower time, labor charges, etc. Based on the delivery notes collected from each Service department, a consolidated bill is made for the customer for payment.

Though the company wants to maintain the service level of 98 percent, they are unable to do so because of manual cumbersome process. Most of the time it has been observed that the necessary spares is not available. In one of the instances, the battery water was not available. Another major concern that the customer has is that, the needs to bring his equipment every time to the service workshop for necessary maintenance/repair.

The Management of Spark Batteries Ltd. wants a system which will provide all the information so that the arrival of the equipment can be planned to ensure the availability of all the service facilities including necessary spare parts. SBL also wants to integrate their sales offices with the service workshop. They also want to have a central knowledge about the health of their products sold to customers for better planning.

Case Study Questions:
1. Identify the problems being faced by Spark Batteries Ltd.
2. What kind of information system would SBL need?
3. What kind of information should they manage to achieve the service level of 98 percent?
4. Suggest the type of data they should capture and manage at: sales office level and at service workshop level.
5. As a sales manager, suggest the various outputs that you would require the system to generate.
6. As a service manager, suggest the various reports that you would require the system to generate.

Key Terms

**Computer-Based Information System** An information system that uses computer hardware and software to perform its information processing activities.

**Data** Facts or observations about physical phenomena or business transactions. More specifically, data are objective measurements of the attributes (characteristics) of entities such as people, places, things, and events.

**Electronic Business (e-Business)** The use of Internet technologies to inter-network and empower business processes, electronic commerce, and enterprise communication and collaboration within a company and with its customers, suppliers, and other business stakeholders.
**Electronic Commerce (e-Commerce)** The buying and selling, marketing and servicing, and delivery and payment of products, services, and information over the Internet, intranets, extranets, and other networks, between an inter-networked enterprise and its prospects, customers, suppliers, and other business partners. Includes business-to-consumer (B2C), business-to-business (B2B), and consumer-to-consumer (C2C) e-commerce.

**Extranet** A network that links selected resources of a company with its customers, suppliers, and other business partners, using the Internet or private networks to link the organizations’ intranets.

**Information System** (1) A set of people, procedures, and resources that collects, transforms, and disseminates information in an organization. (2) A system that accepts data resources as input and processes them into information products as output.

**Management Information System (MIS)** A management support system that produces prespecified reports, displays, and responses on a periodic, exception, demand, or push reporting basis.

**Management Support System (MSS)** An information system that provides information to support managerial decision making. More specifically, an information-reporting system, executive information system, or decision support system.

**Operations Support System (OSS)** An information system that collects, processes, and stores data generated by the operations systems of an organization and produces data and information for input into a management information system or for the control of an operations system.

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**In Review**

Information systems perform three vital roles in business firms. Business applications of IS support an organization’s business processes and operations, business decision making, and strategic competitive advantage. Major application categories of information systems include operations support systems, such as transaction processing systems, process control systems, and enterprise collaboration systems; and management support systems, such as management information systems, decision support systems, and executive information systems. Other major categories are expert systems, knowledge management systems, strategic information systems, and functional business systems. However, in the real world, most application categories are combined into cross-functional information systems that provide information and support for decision making and also performing operational information processing activities.

Information systems have come a long way from electronic data processing to MIS and then decision support systems in the 1970s. 1980s saw the beginning of end-user computing. Also, executive information systems (EIS) were developed. 1990-2000s saw the advent of e-commerce. The last decade has witnessed the emergence of enterprise resource planning and business intelligence globally.

There are several types of information systems among which the most important ones are operations support systems and management support systems.

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**Multiple-Choice Questions**

1. Information technology can be used to support _____________.
   a. product development teams
   b. customer support processes
   c. any other business activity
   d. All the choices are correct

2. All the following are examples of an information system, except:
   a. A day planner
   b. A cash register
3. How do information systems aid in decision making?
   a. Information systems help companies determine investments.
   b. Information systems help companies determine which products to sell or discontinue.
   c. Information systems can be used to gain competitive advantage.
   d. All of the choices are correct

4. All of the following are fundamental reasons for business applications of information technology except:
   a. Support of strategies for competitive advantage
   b. Support of business processes and operations
   c. Compliance with environmental regulations
   d. Decision making support

5. The expanding role of information systems from the 1950s to the present, in sequential order, are:
   a. Management reporting, decision support, electronic business and commerce, data processing, strategic and end user support
   b. Data processing, management reporting, strategic and end user support, electronic business and commerce, decision support
   c. Data processing, management reporting, decision support, strategic and end user support, electronic business and commerce
   d. Electronic business and commerce, management reporting, data processing, strategic and end user support, decision support

6. Which of the following is a false statement?
   a. Today’s information systems are doing the same basic things that they did over 40 years ago.
   b. Today there is a much higher level of integration of system functions.
   c. Today there is greater connectivity across dissimilar system components.
   d. None of the statements is false.

7. Companies generally rely on e-business applications to do all of the following except:
   a. Re-engineer internal business processes
   b. Implement electronic commerce systems
   c. Monitor employee productivity
   d. Promote enterprise collaboration among business teams and workgroups

8. In an e-business enterprise, an intranet refers to:
   a. An Internet-like network inside the enterprise
   b. A network between an enterprise and its trading partners
   c. A network between the members of a single workgroup
   d. All the choices are correct

9. e-business uses Internet technologies to work and empower ____________.
   a. business processes
   b. electronic commerce
   c. collaboration among business teams
   d. All of the choices are correct

10. e-commerce ____________.
    a. involves buying, selling, marketing, and servicing of products, services, and information over a variety of computer networks
    b. uses the Internet, intranets, and extranets to support every step of the commercial process, such as multimedia advertising, product information, and customer support
    c. involves Internet security and payment mechanisms that ensure completion of delivery and payment processes
    d. All of the choices are correct

   Key to MCQs
   (a) 8, 7, 6, 5, 4, 3, 2, 1
   (p) 10, 9, 8, 7, 6, 5, 4, 3

   *IT Tools*
   
   Self-Learning Material
   
   NOTES

   c. A group of marbles in a box
   d. A paper-based accounting ledger
Discussion Questions

1. How can information technology support a company’s business processes and decision making and give it a competitive advantage? Give examples to illustrate your answer.

2. How does the use of the Internet, intranets, and extranets by companies today support their business processes and activities?

3. How can a manager demonstrate that he or she is a responsible end user of information systems? Give several examples.

4. What are some of the toughest management challenges in developing IT solutions to solve business problems and meet new business opportunities?

5. Why are there so many conceptual classifications of information systems? Why are they typically integrated in the information systems found in the real world?

References


